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TETRYONICS

The charged topology of periodic & compound Matter

Foundational Quantum Chemistry

Abraham

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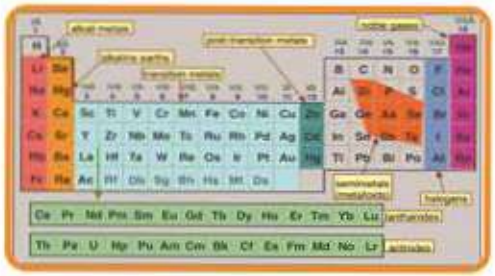
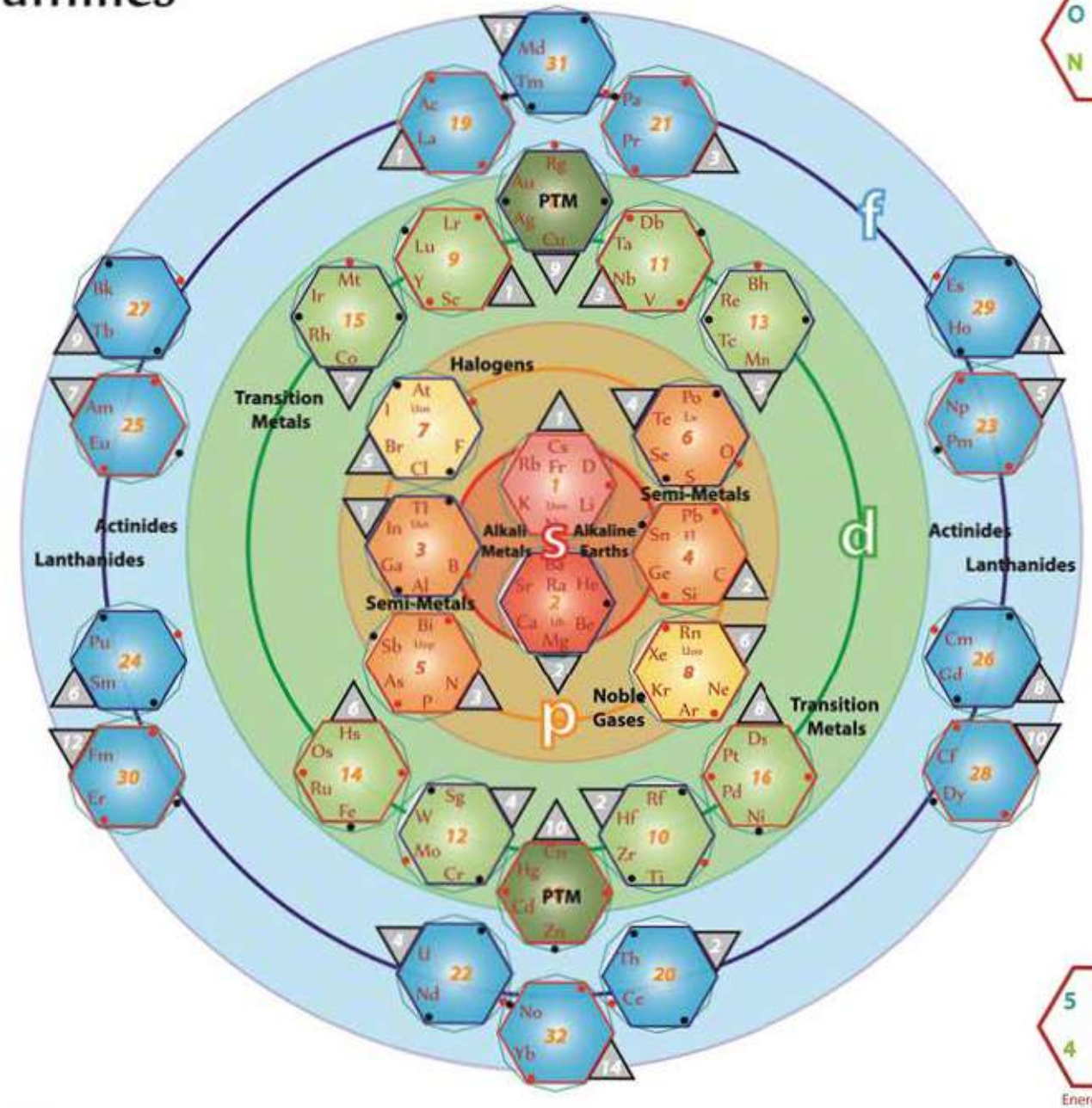
Periodic element Families





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Alkali Metals

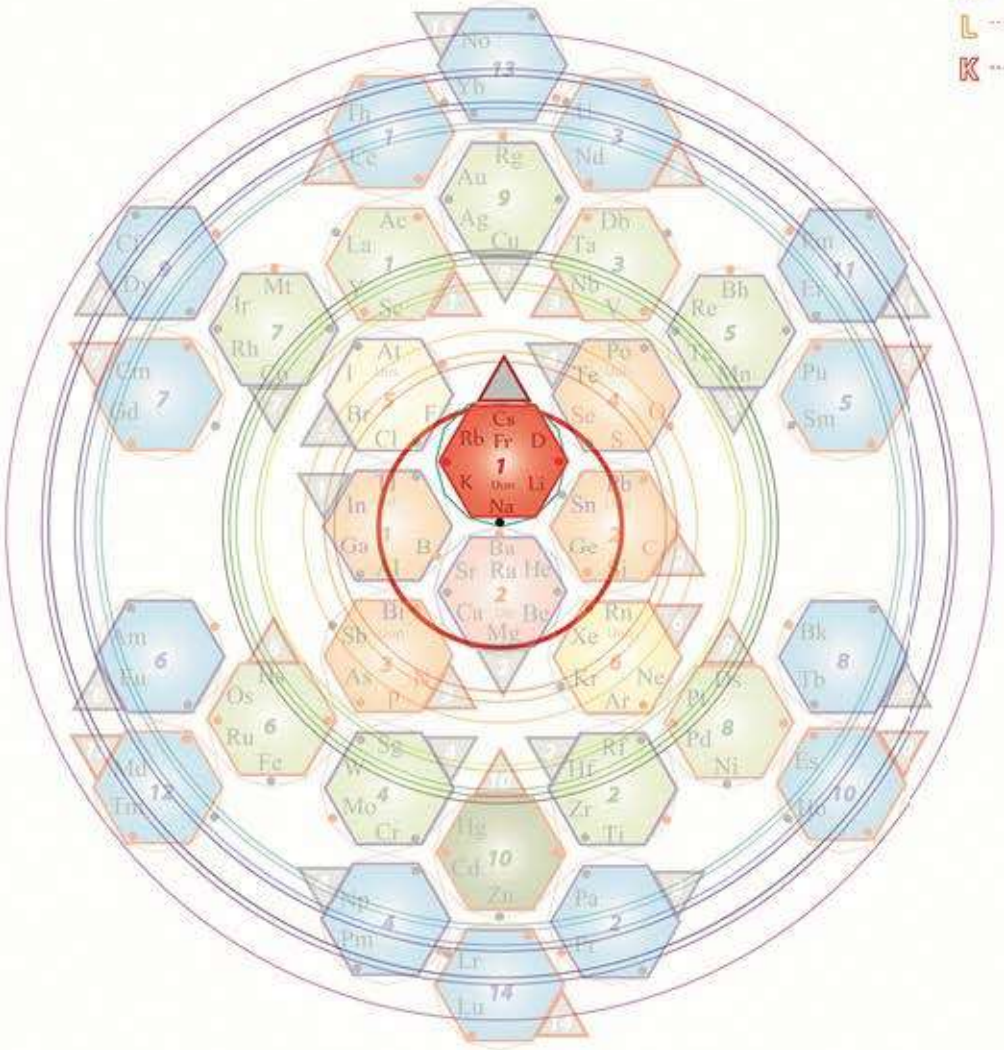
The alkali metals are silver-colored (caesium has a golden tinge), soft, low-density metals, which react readily with halogens to form ionic salts, and with water to form strongly alkaline (basic) hydroxides.

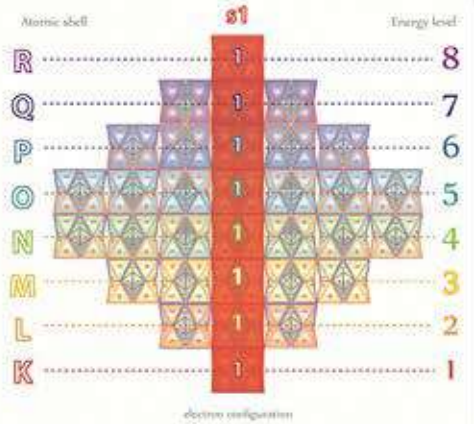
These elements all have one electron in their outermost shell, so the energetically preferred state of achieving a filled electron shell is to lose one electron to form a singly charged positive ion.

s Orbital

n1-8

s1 sub-orbital





8

Alkaline Metals

The alkali metals are all highly reactive and are never found in elemental form in nature.

As a result, in the laboratory they are stored under mineral oil. They also tarnish easily and have low melting points and densities. Potassium and rubidium possess a weak radioactive characteristic (harmless) due to the presence of long duration radioactive isotopes.

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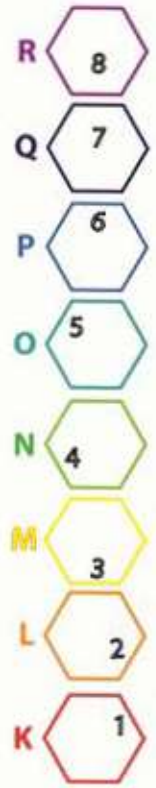
Alkaline Earths

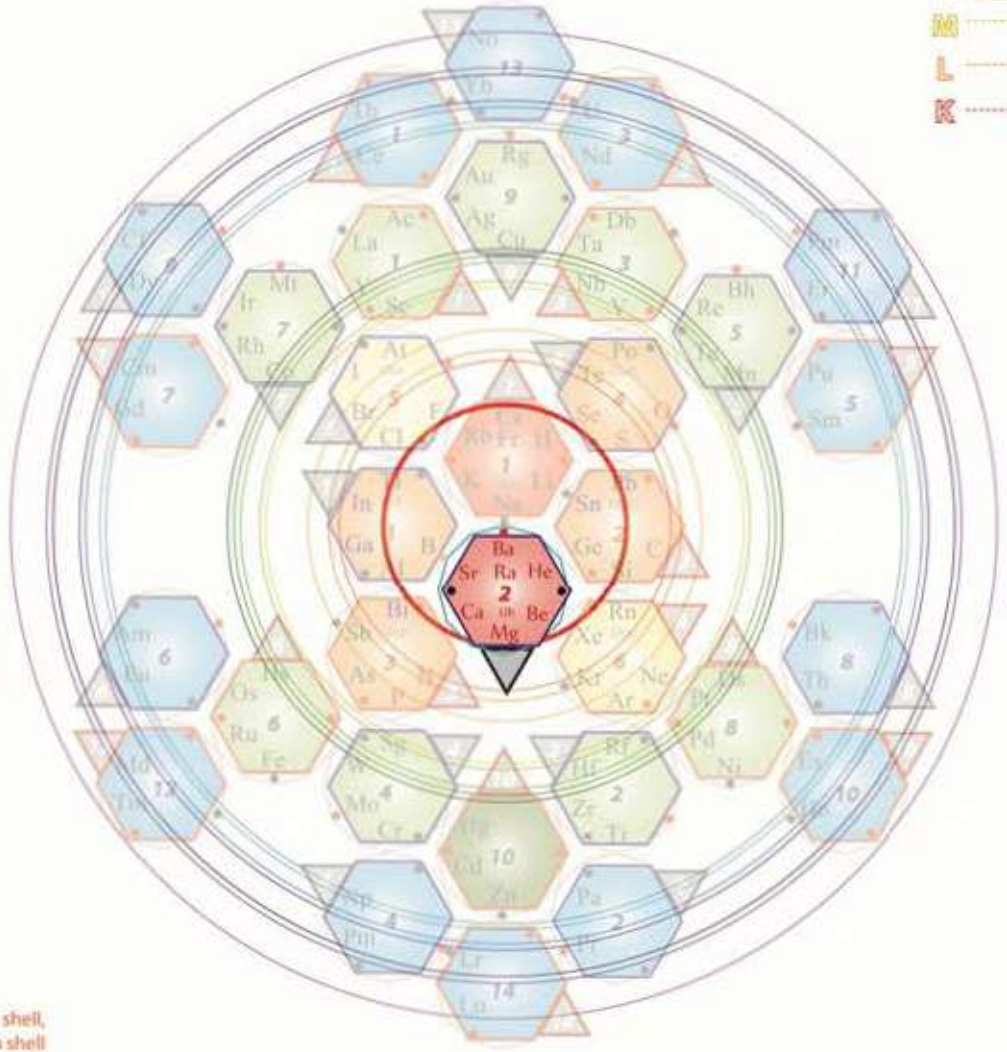
The alkaline earth metals are silver colored, soft metals, which react readily with halogens to form ionic salts, and with water, though not as rapidly as the alkali metals, to form strong alkaline (basic) hydroxides.

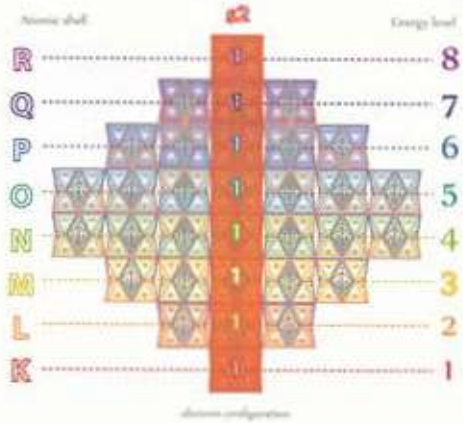


s Orbital

n1-8

s2 sub-orbital





8 Alkaline Earths

All the alkaline earth metals have two electrons in their valence shell, so the energetically preferred state of achieving a filled electron shell is to lose two electrons to form doubly charged positive ions.

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Metalloids

A metaloid is a material with a small overlap in the energy of the conduction band and valence bands.

Unlike a regular metal, metaloids have been described electrically as charge carriers of both types (holes and electrons), so it could be argue that they should be called 'double-metals' rather than metaloids.

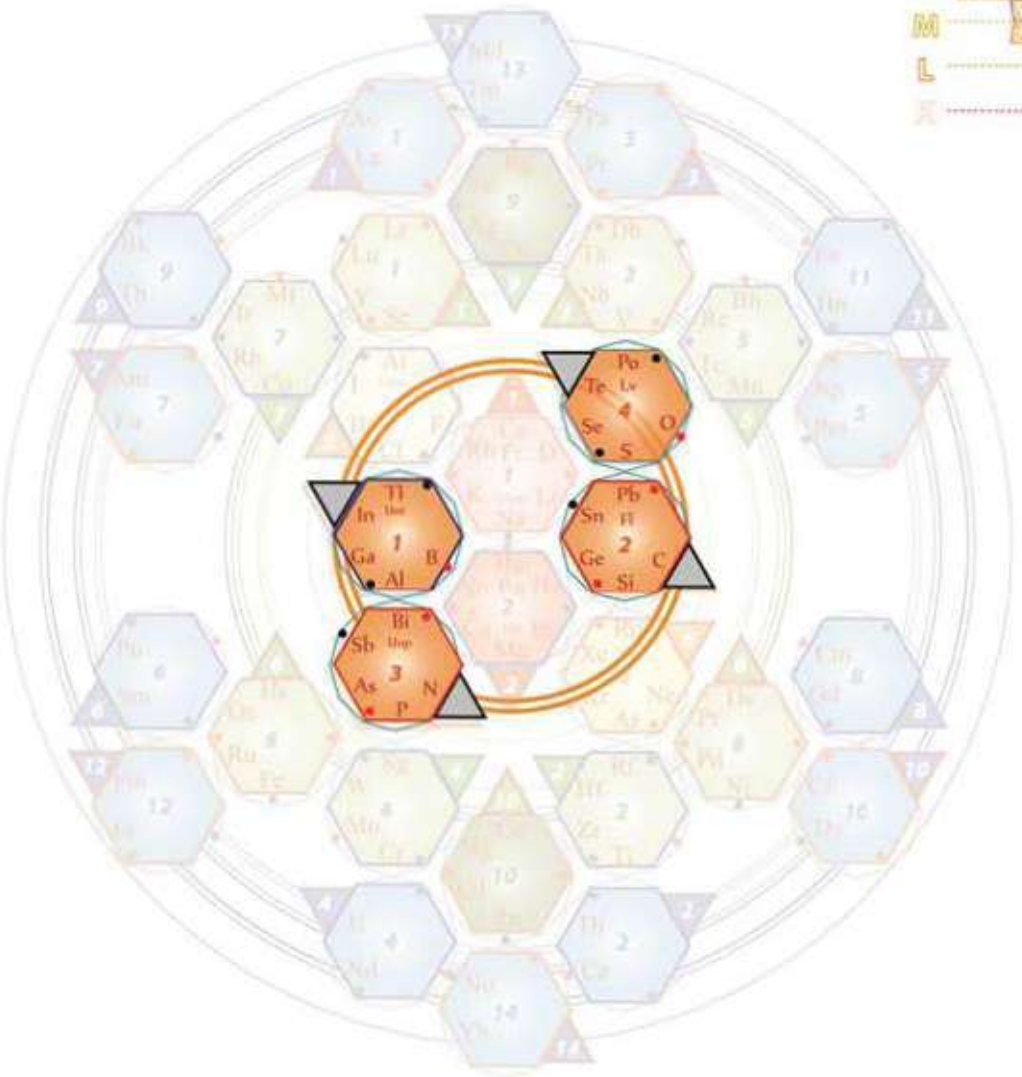
As metaloids have fewer charge carriers than metals, they typically have lower electrical and thermal conductivities.

p 1-4 Non-Metal Metaloid Poor-Metal

2 p-Orbitals

n2-7

p1-4 sub-orbitals



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Semi-Metals

Charge carriers typically occur in much smaller numbers than in a real metal. In this respect they resemble degenerate semiconductors more closely.
This explains why the electrical properties of metaloids are partway between those of metals and semiconductors.

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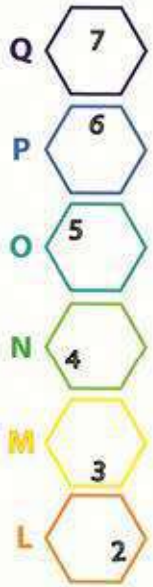
Halogens

Owing to their high reactivity, the halogens are found in the environment only in compounds or as ions.

Halide ions and oxoanions such as Iodate (IO_3^-) can be found in many minerals and in seawater.

Halogenated organic compounds can also be found as natural products in living organisms. In their elemental forms, the halogens exist as diatomic molecules, but these only have a fleeting existence in nature and are much more common in the laboratory and in industry.

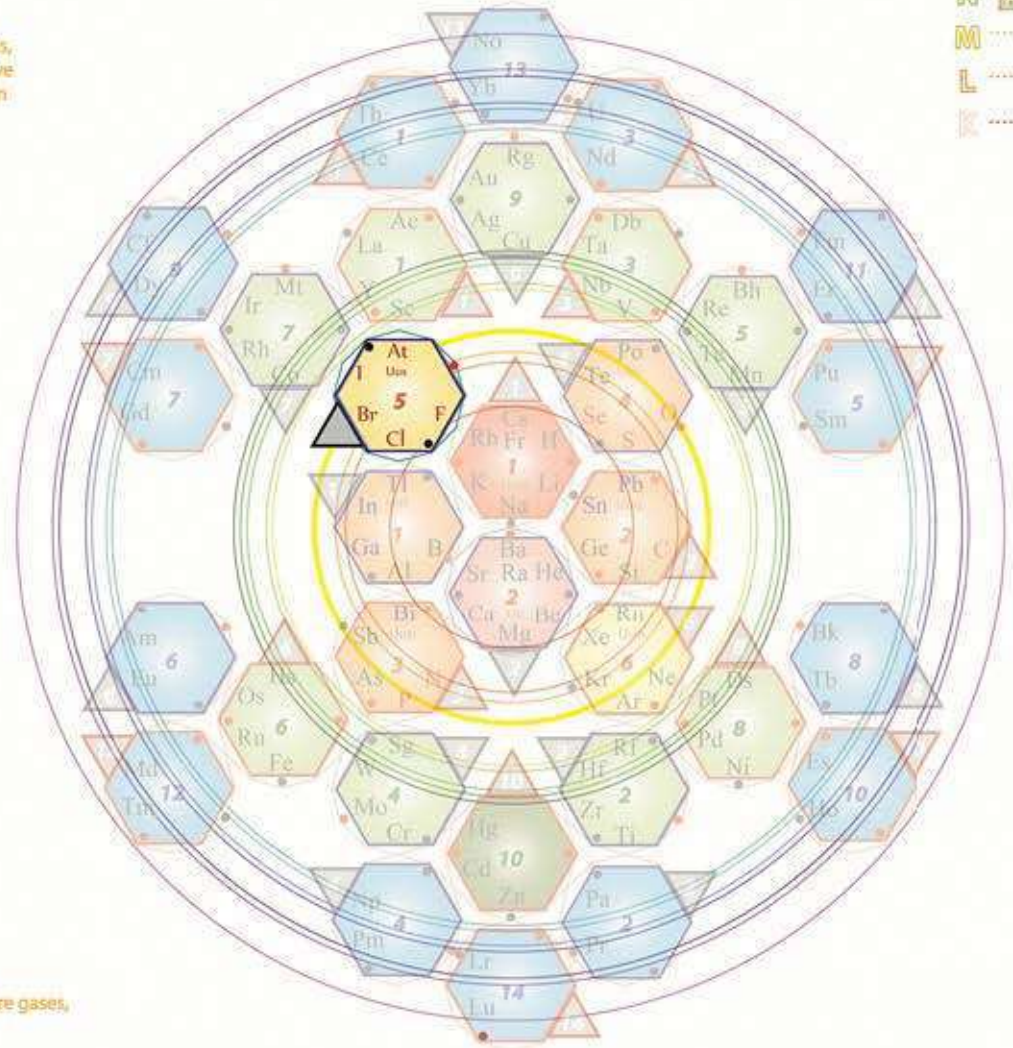


p 5 Halogen

p3 Orbital

n2-7

p5 sub-orbital



6 Halogens

At room temperature and pressure, fluorine and chlorine are gases, bromine is a liquid and iodine and astatine are solids.

Group 17 is therefore the only periodic table group exhibiting all three states of matter at room temperature

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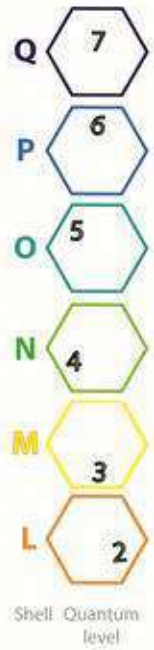
Nobel Gases

The properties of the noble gases can be well explained by modern theories of atomic structure: their outer shell of valence electrons is considered to be "full", giving them little tendency to participate in chemical reactions, and only a few hundred noble gas compounds have been prepared.

The melting and boiling points for each noble gas are close together, differing by less than 10 °C (18 °F); consequently, they are liquids only over a small temperature range.

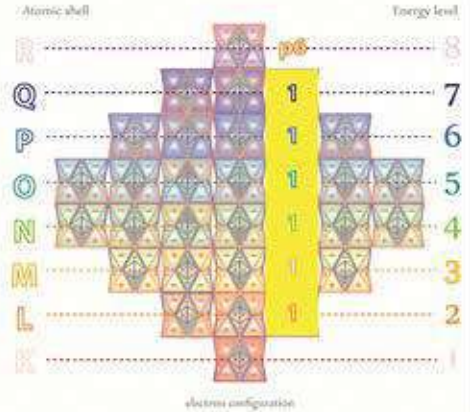


p 6 Noble Gas

completed p3 Orbital

n2-7

p6 sub-orbital



6 Nobel Gases

Neon, argon, krypton, and xenon are obtained from air using the methods of liquefaction of gases and fractional distillation.

Helium is typically separated from natural gas, and radon is usually isolated from the radioactive decay of dissolved radium compounds.

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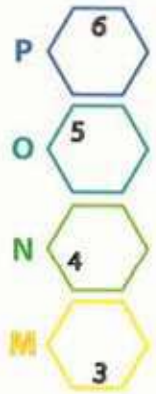
Transitional Metals

In chemistry, the term transition metal commonly refers to any element in the d-block of the periodic table, including the group 12 elements zinc, cadmium and mercury.

This corresponds to groups 3 to 12 on the periodic table, which are all metals.

More strictly, IUPAC defines a transition metal as "an element whose atom has an incomplete d sub-shell, or which can give rise to cations with an incomplete d sub-shell."

The first definition is simple and has traditionally been used. However, many interesting properties of the transition elements as a group are the result of their partly filled d subshells.

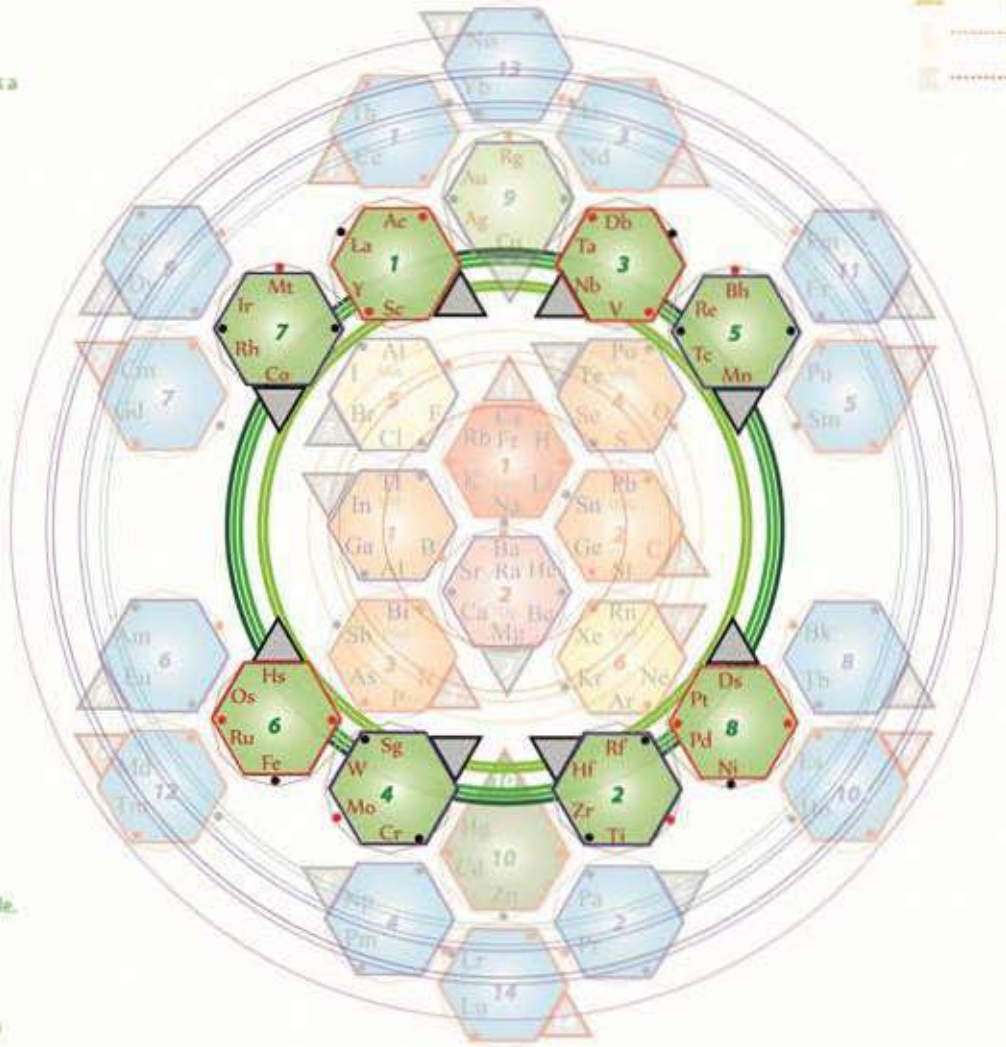


d 1-8 Transition Metal

4 d-Orbitals

n3-6

d1-8 sub-orbitals



32 Transition Metals

The name transition comes from their position in the periodic table. In each of the four periods in which they occur, these elements represent the successive addition of electrons to the d atomic orbitals of the atoms.

In this way, the transition metals represent the transition between group 2 elements and group 13 elements.

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Post-Transition Metals

In chemistry, the term post-transition metal is used to describe the category of metallic elements to the right of the transition elements on the periodic table.

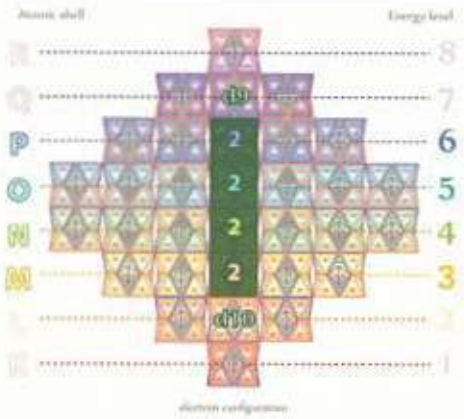
There are two IUPAC definitions of "transition element" that have been in apparent conflict with one another since September 2007.

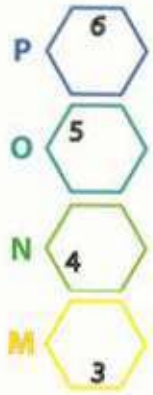
According to the first definition, transition metals are elements in group 3 through group 11.
In this case, post-transition metals include all of group 12—zinc, cadmium, mercury, and ununbium

According to the second definition, transition elements either have an incomplete d-subshell or have the ability to form an incomplete d-subshell.

Post Transitional metals are normally defined as completed d orbitals

Tetryonics suggests it may be appropriate to include all the d5 orbital elements in this grouping



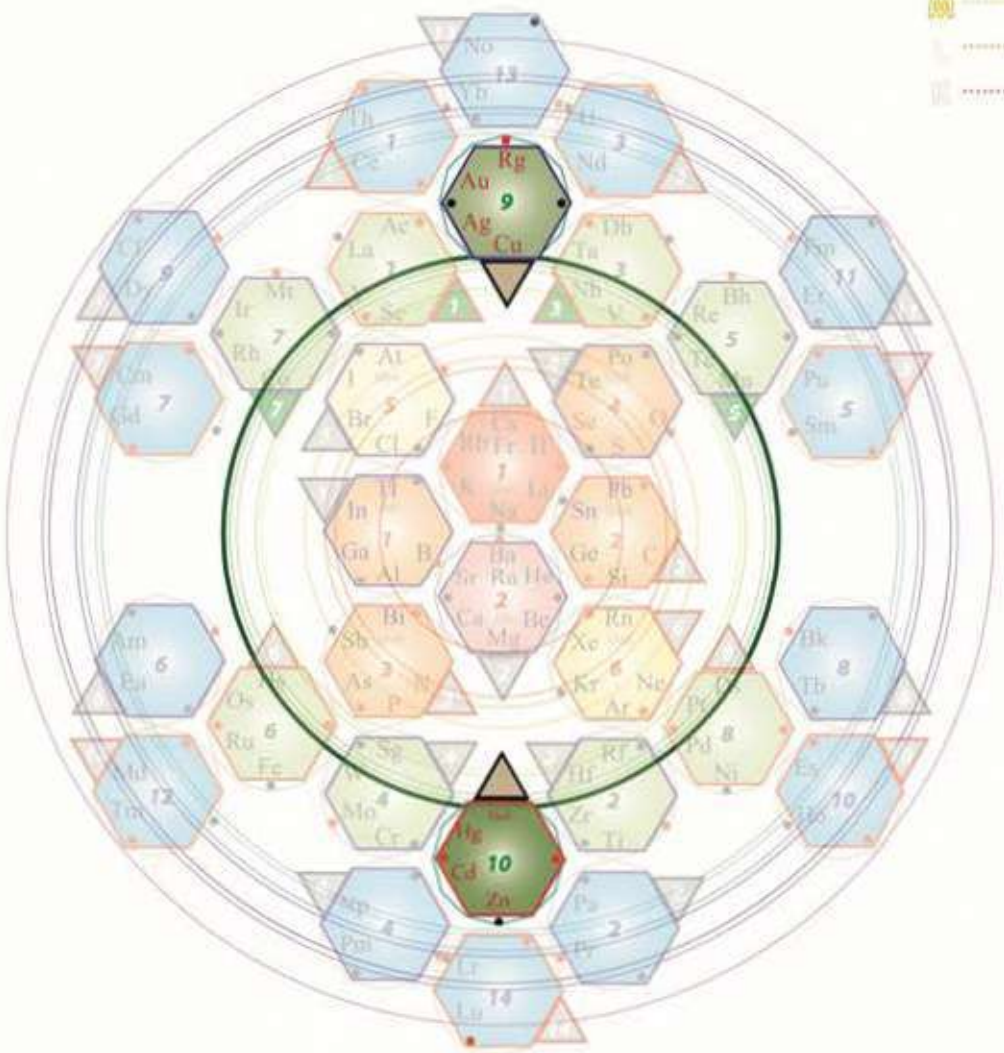


d 9-10 Post Transition Metal

d5 Orbital

n3-6

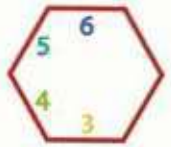
d9-10 sub-orbitals



8 Post-transitional Metals

In 2007, mercury(IV) fluoride was synthesized.[2][3] This compound contains a mercury atom with an incomplete d-subshell, and ununbium is predicted to have the capacity to form a similar electronic configuration.

In this case, post-transition metals include only zinc and cadmium within group 12.



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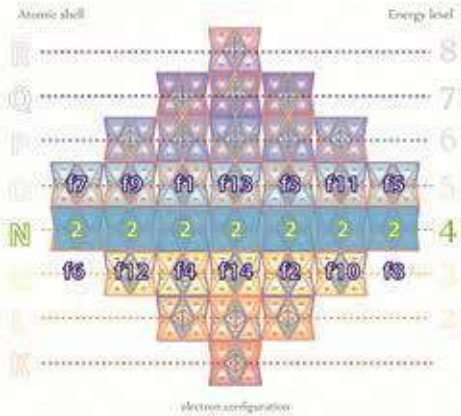
Lanthanoids

All lanthanoids are f-block elements, corresponding to the filling of the 4f electron shell

The lanthanoid series (Ln) is named after Lanthanum.

The trivial name "rare earths" is sometimes used to describe all the lanthanoids together with scandium and yttrium.

These elements are in fact fairly abundant in nature, although rare as compared to the "common" earths such as lime or magnesia. Cerium is the 26th most abundant element in the Earth's crust, neodymium is more abundant than gold and even thulium (the least common naturally-occurring lanthanoid) is more abundant than iodine.



f 1-14 Lanthanoid

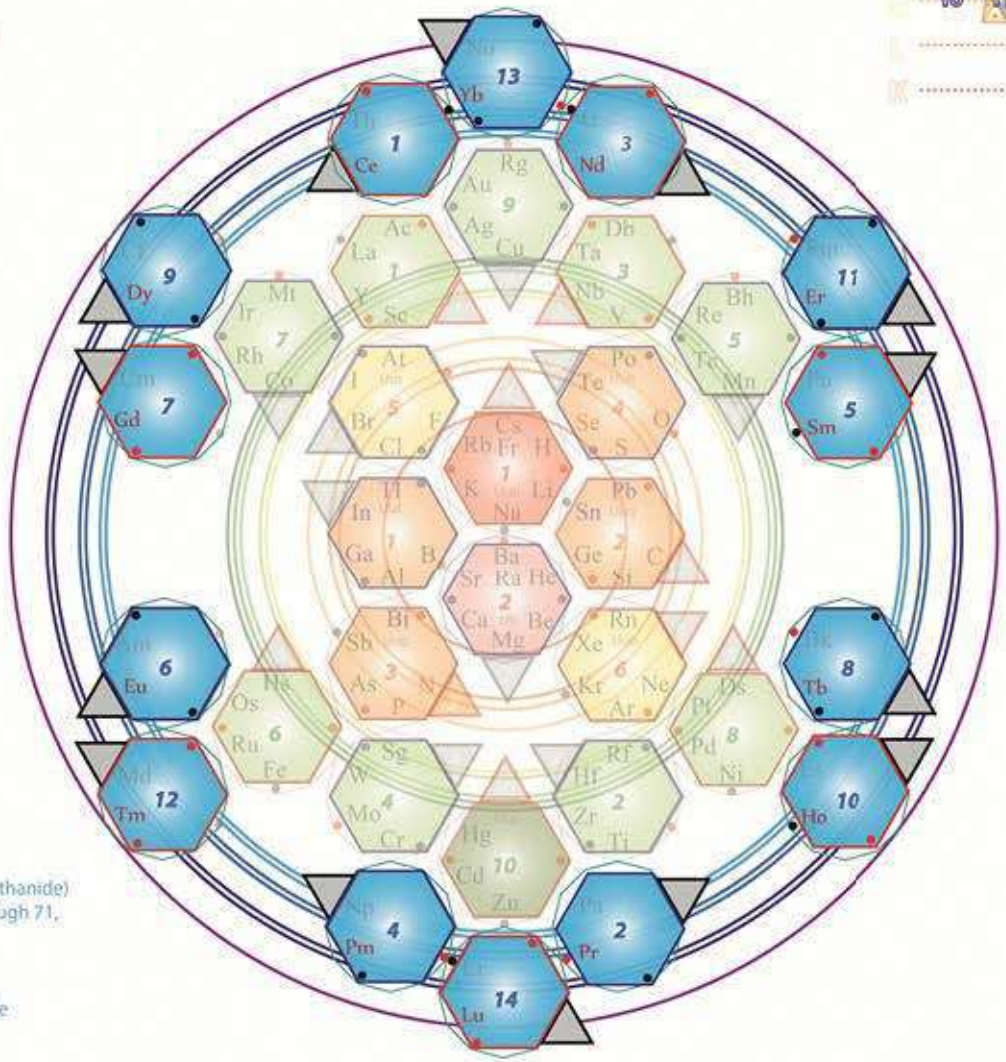
N 4

Shell Quantum level

7 f-Orbitals

n4

f1-14 sub-orbitals



14 Lanthanoids

The term "rare earths" arises from the minerals from which they were isolated, which were uncommon oxide-type minerals.

According to the IUPAC terminology, the lanthanoid (previously lanthanide) series comprises the fifteen elements with atomic numbers 57 through 71, from Lanthanum to Lutetium.

The use of this name is deprecated by IUPAC, as they are neither rare in abundance nor "earths" (an obsolete term for water-insoluble strongly basic oxides of electropositive metals incapable of being smelted into metal using late 18th century technology).

4

Quantum level

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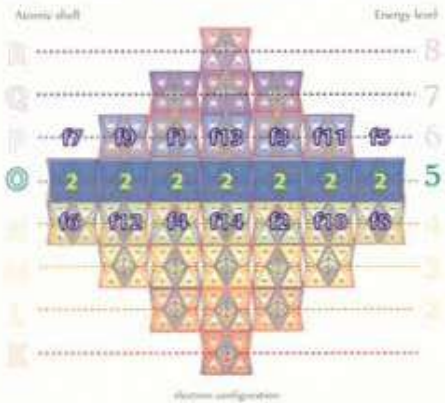
Actinoids

According to IUPAC nomenclature, the actinoid (previously actinide) series encompasses the 15 chemical elements that lie between actinium and lawrencium included on the periodic table, with atomic numbers 89 - 103.

The actinoid series derives its name from the first element in the series, actinium, and ultimately from the Greek ακτις (aktis), "ray," reflecting the elements' radioactivity.

The actinoids display less similarity in their chemical properties than the lanthanoid series (Ln), exhibiting a wider range of oxidation states, which initially led to confusion as to whether actinium, thorium, and uranium should be considered d-block elements. All actinoids are radioactive.



f 1-14 Actinoid

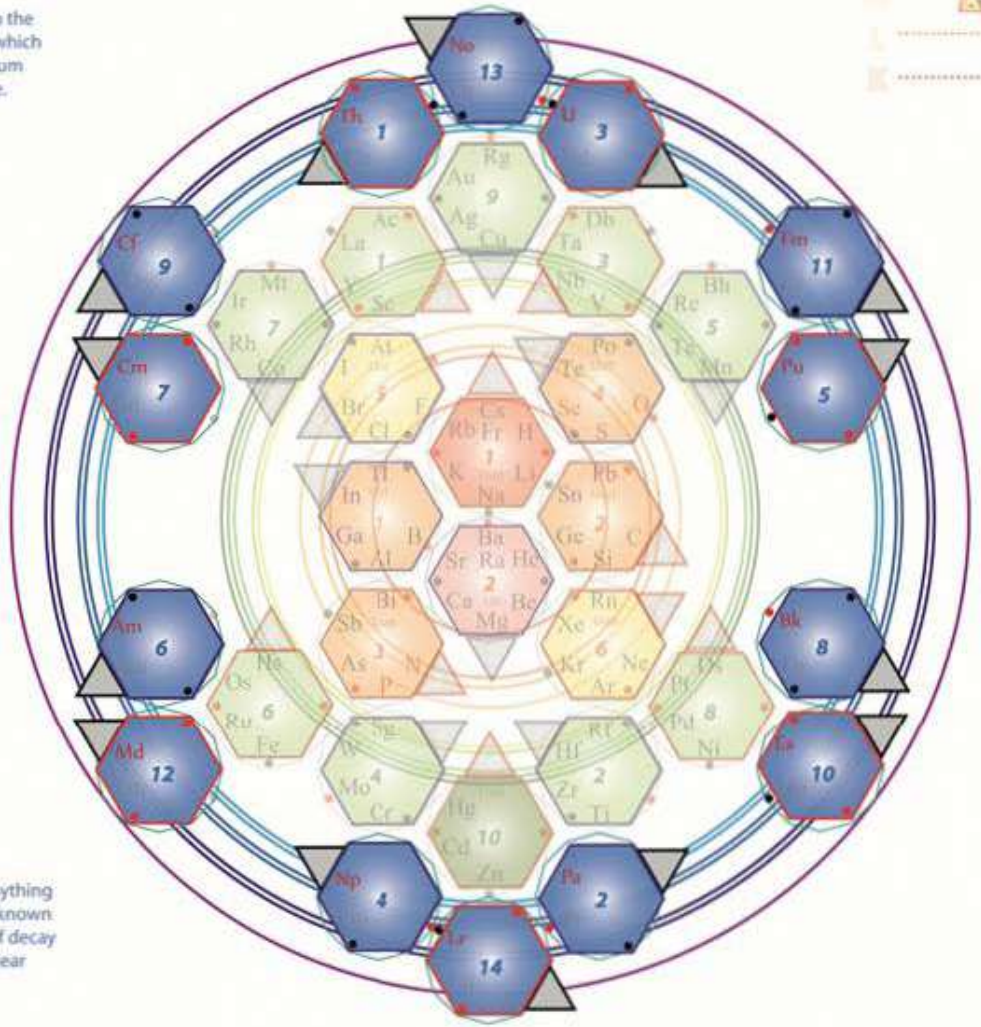
o 5

Shell Quantum level

7 f-Orbitals

n5

f1-14 sub-orbitals



14 Actinoids

Only thorium and uranium occur naturally in the earth's crust in anything more than trace quantities. Neptunium and plutonium have been known to show up naturally in trace amounts in uranium ores as a result of decay or bombardment. The remaining actinoids were discovered in nuclear fallout, or were synthesized in particle colliders.

The latter half of the series possess exceedingly short half-lives.

5

Quantum level

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$$E = nhv$$

$$m = Ev^2/c^2$$

$$\overset{R}{\underset{K}{P\Sigma}}\overset{32}{\underset{25}{\left[\left[72(n)^2\right]+\left[12e19\right]+\left[m_e v^2\right]\right]}}\overset{8}{\underset{1}{}}$$

Baryon rest masses · lepton rest mass · KEM

Deuterium mass-energy per shell

Periodic summation formula

re-terming the masses of the periodic summation formula into Planck energy quanta we can derive a quadratic formulation for the mass-energies of any periodic element

Baryon energies determine electron KEMs

$$h\overset{R}{\underset{K}{P\Sigma}}\overset{32}{\underset{25}{\left[\left[72(n^2)\right]+\left[v\right]+\left[12e19\right]\right]}}\overset{8}{\underset{1}{}}$$

Baryon rest mass-energy · KEM · lepton rest mass-energy

Deuterium mass-energy per shell

electron rest mass-Matter is velocity invariant

quadratic PΣ formulation

$$n = 1e19v$$

this quadratic form can be again re-organised to better reflect the specific rest mass-energy contributions of Baryons, electrons & their KEM fields to the molar mass-energy-Matter of any specific element

atomic shell energies

$$\overset{R}{\underset{K}{P\Sigma}}\overset{32}{\underset{25}{\left[\left[72(n^2)\right]+\left[12e19\right]+\left[\Delta v\right]\right]}}\overset{8}{\underset{1}{}}$$

Baryon rest quanta · lepton rest quanta · KEM

nuclear mass-energy quanta per shell

spectral line transitions

Elementary PΣ formulation

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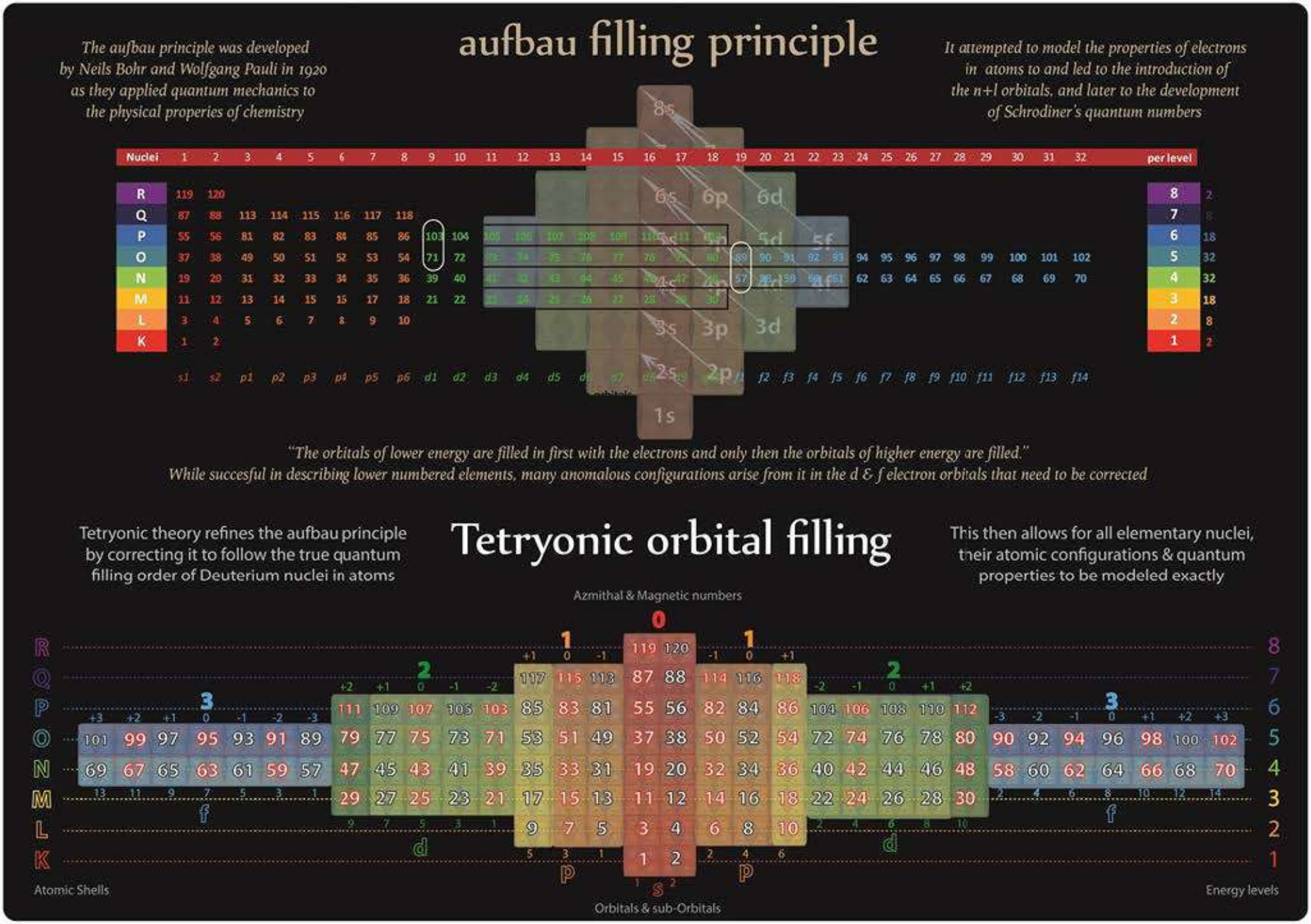
aufbau filling principle
The aufbau principle was developed by Neils Bohr and Wolfgang Pauli in 1920 as they applied quantum mechanics to the physical properies of chemistry
It attempted to model the properties of electrons in atoms to and led to the introduction of the n+l orbitals, and later to the development of Schrodiner's quantum numbers
Nuclei
per level
"The orbitals of lower energy are filled in first with the electrons and only then the orbitals of higher energy are filled."
While succesful in describing lower numbered elements, many anomalous configurations arise from it in the d & f electron orbitals that need to be corrected
Tetryonic orbital filling
Tetryonic theory refines the aufbau principle by correcting it to follow the true quantum filling order of Deuterium nuclei in atoms
This then allows for all elementary nuclei, their atomic configurations & quantum properties to be modeled exactly
Azmithal & Magnetic numbers
Atomic Shells
Energy levels
Orbitals & sub-Orbitals

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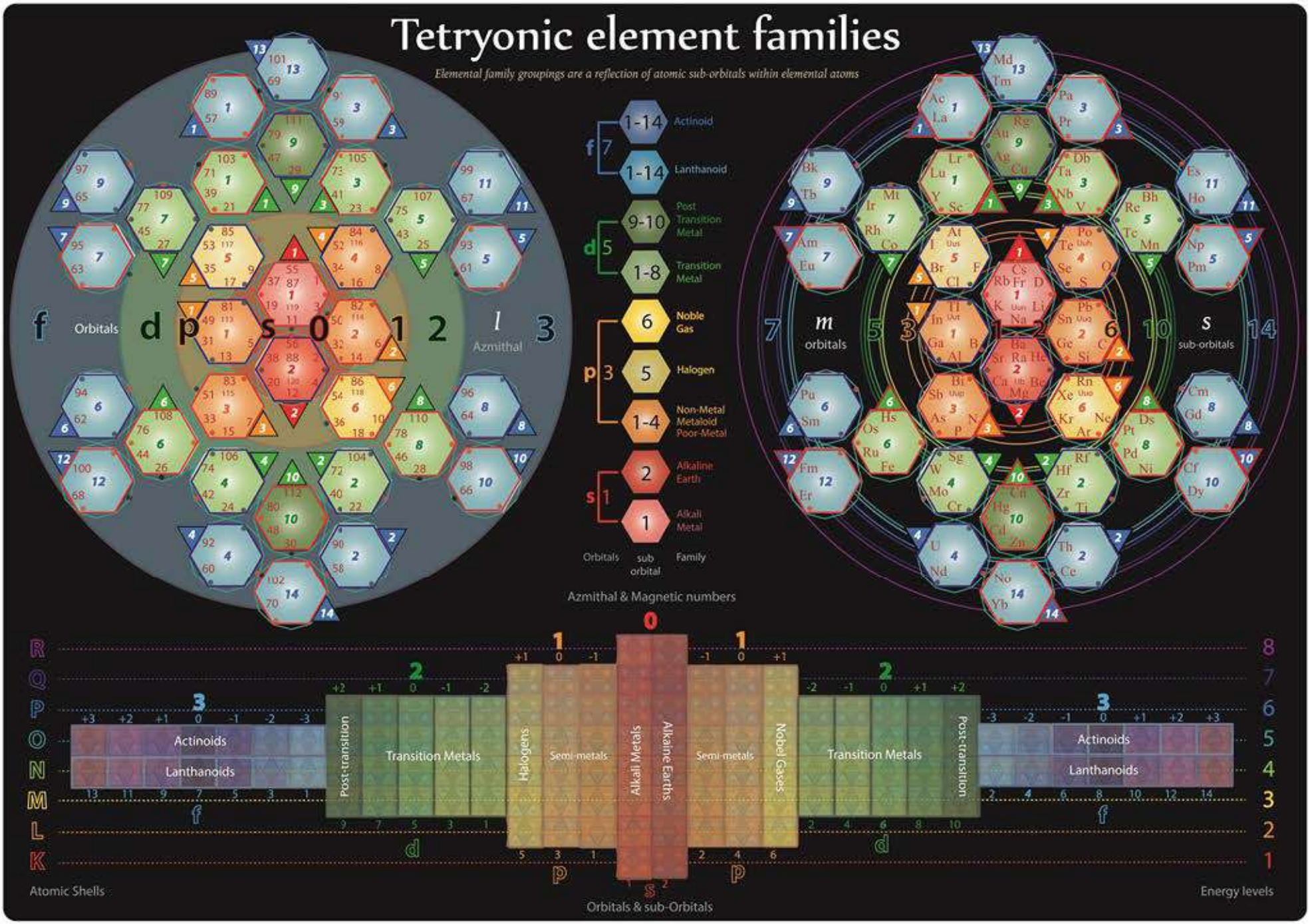

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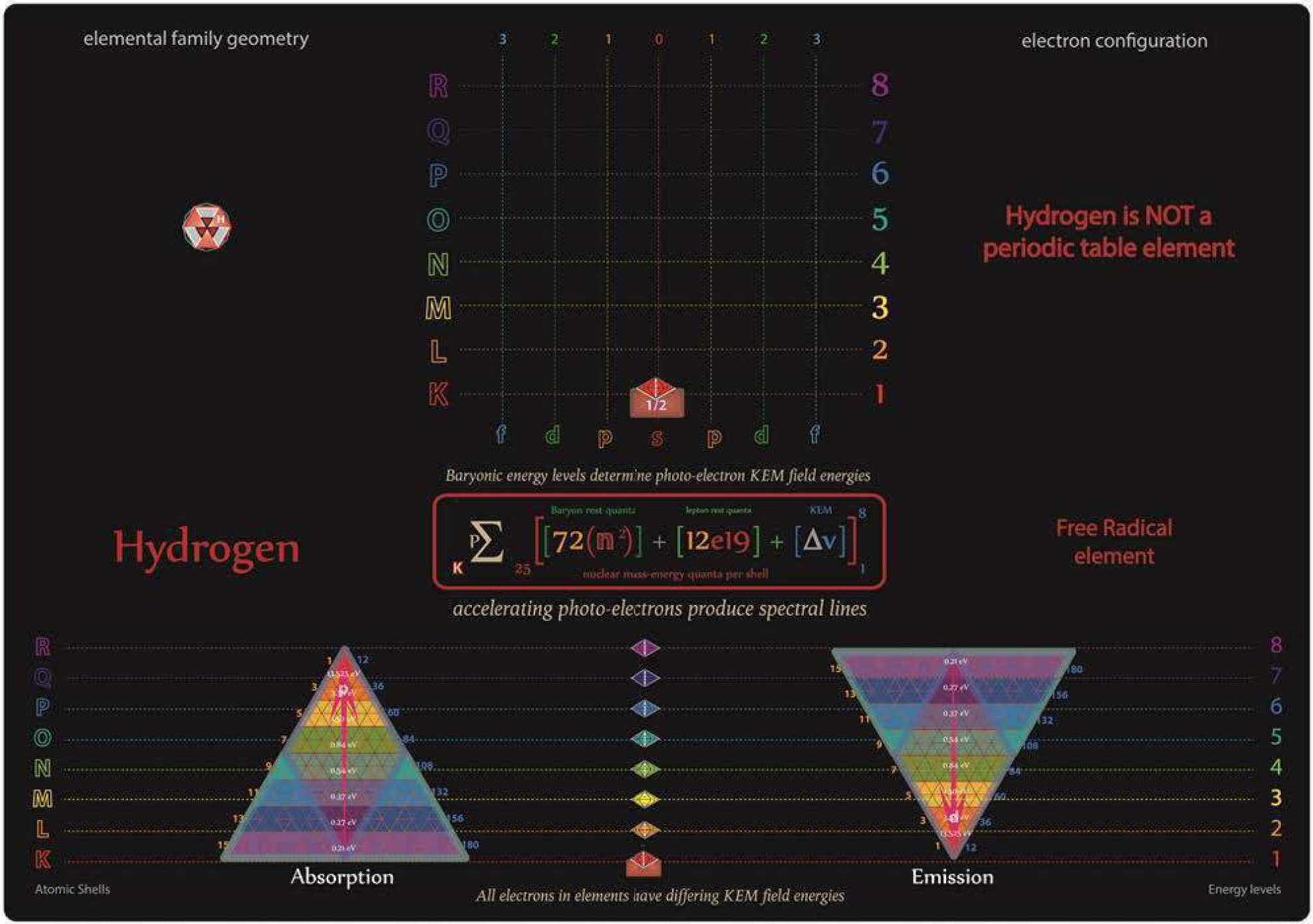

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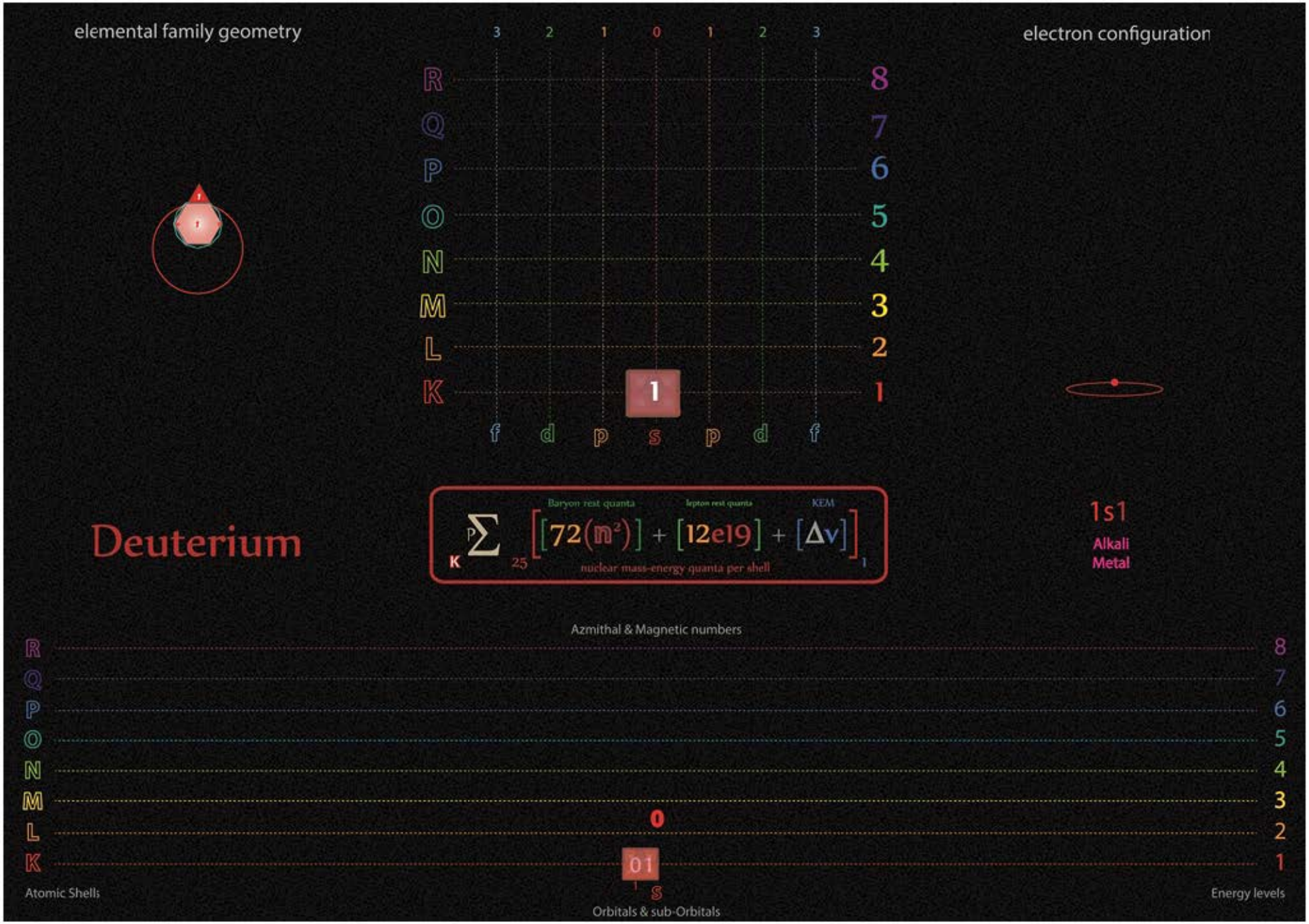

Tetryonics 53.01 - Deuterium atomic config

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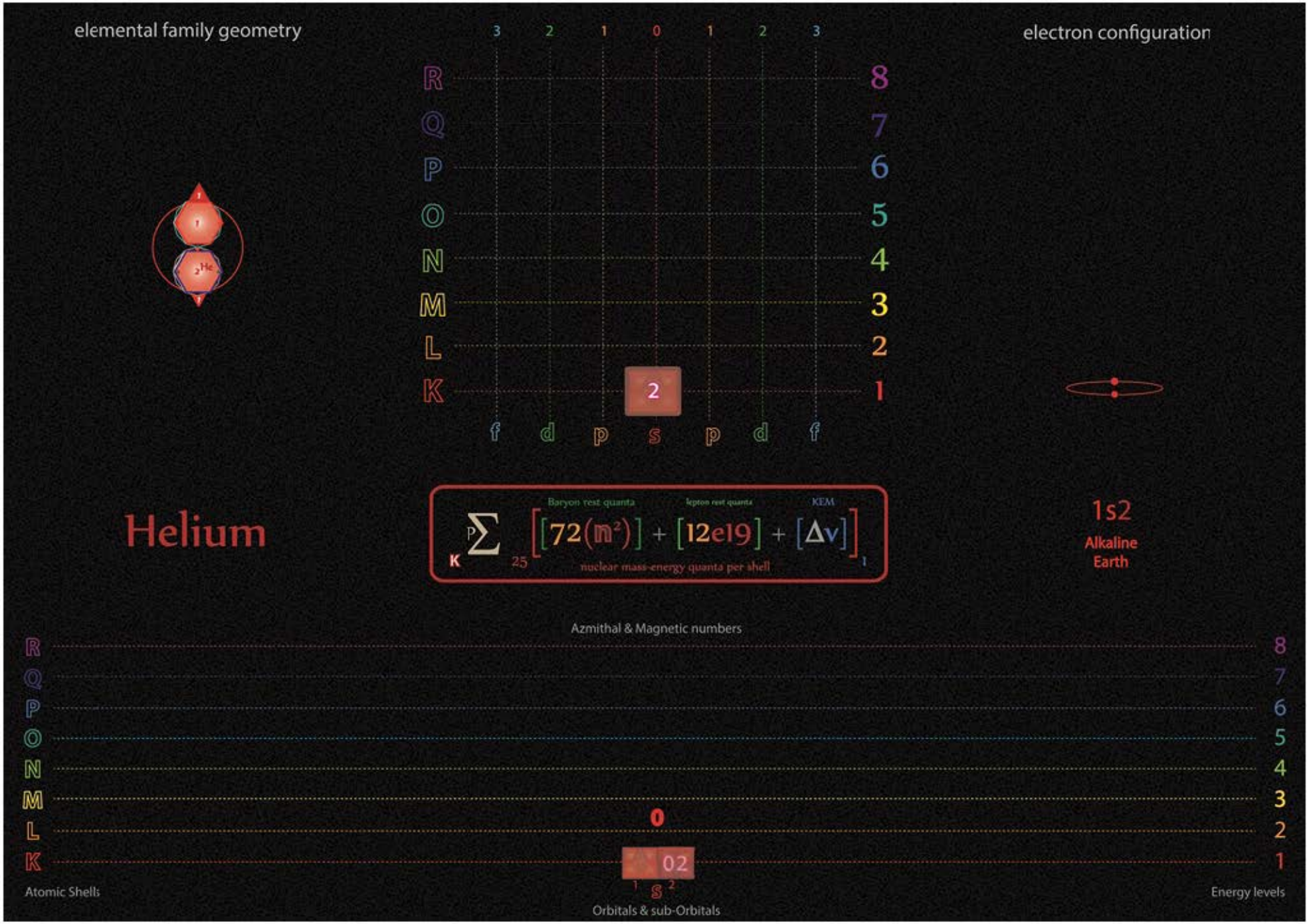

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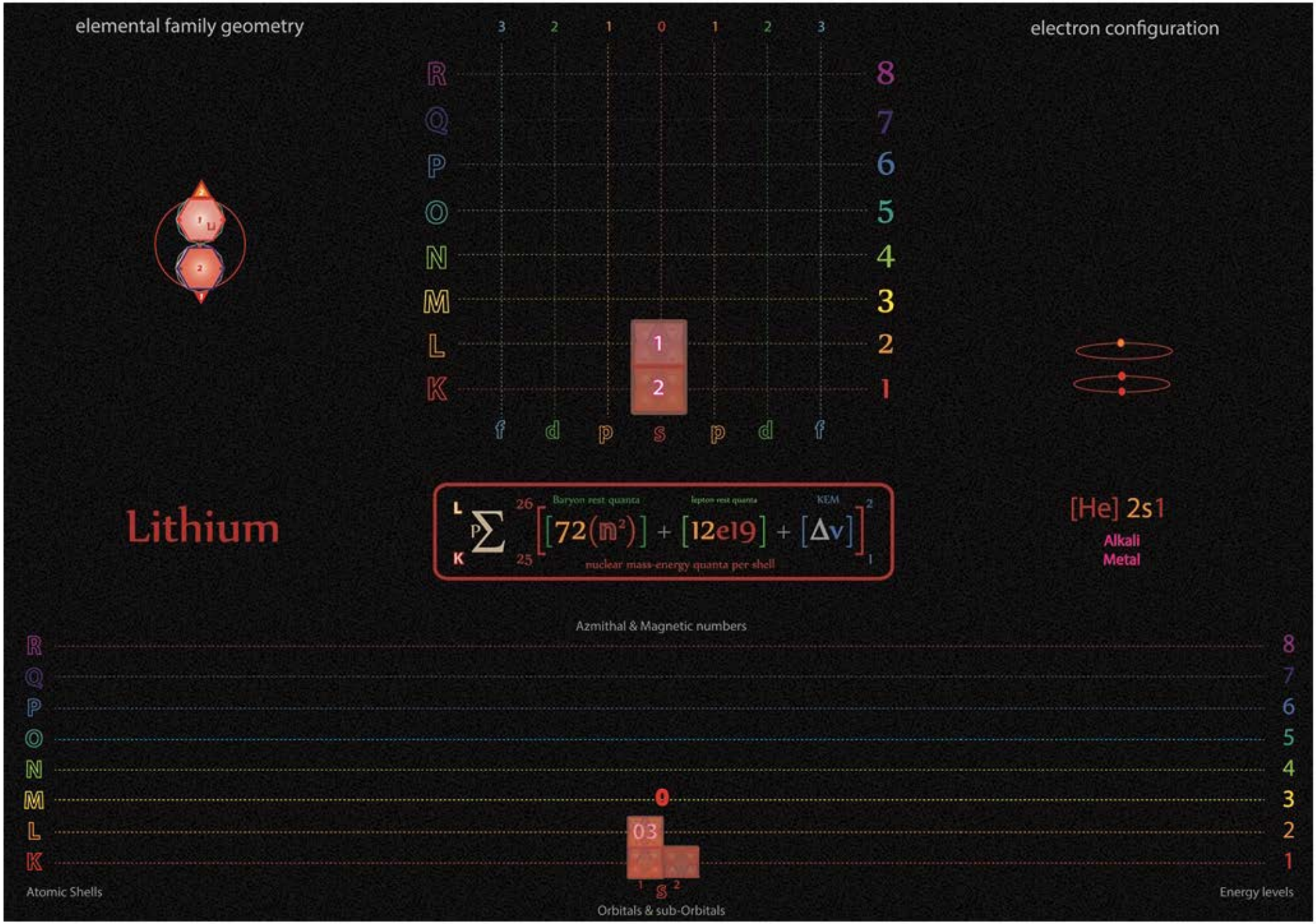

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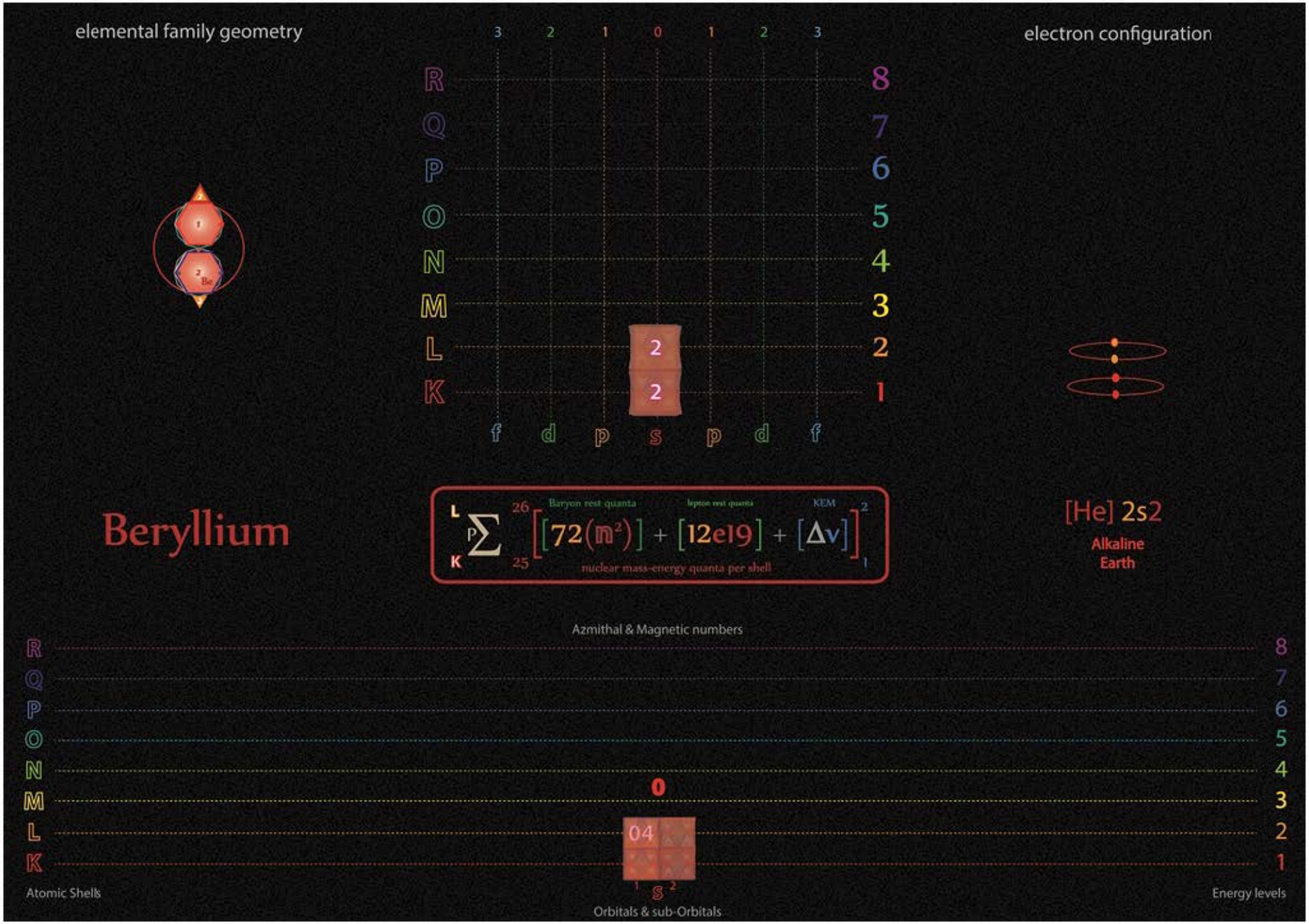

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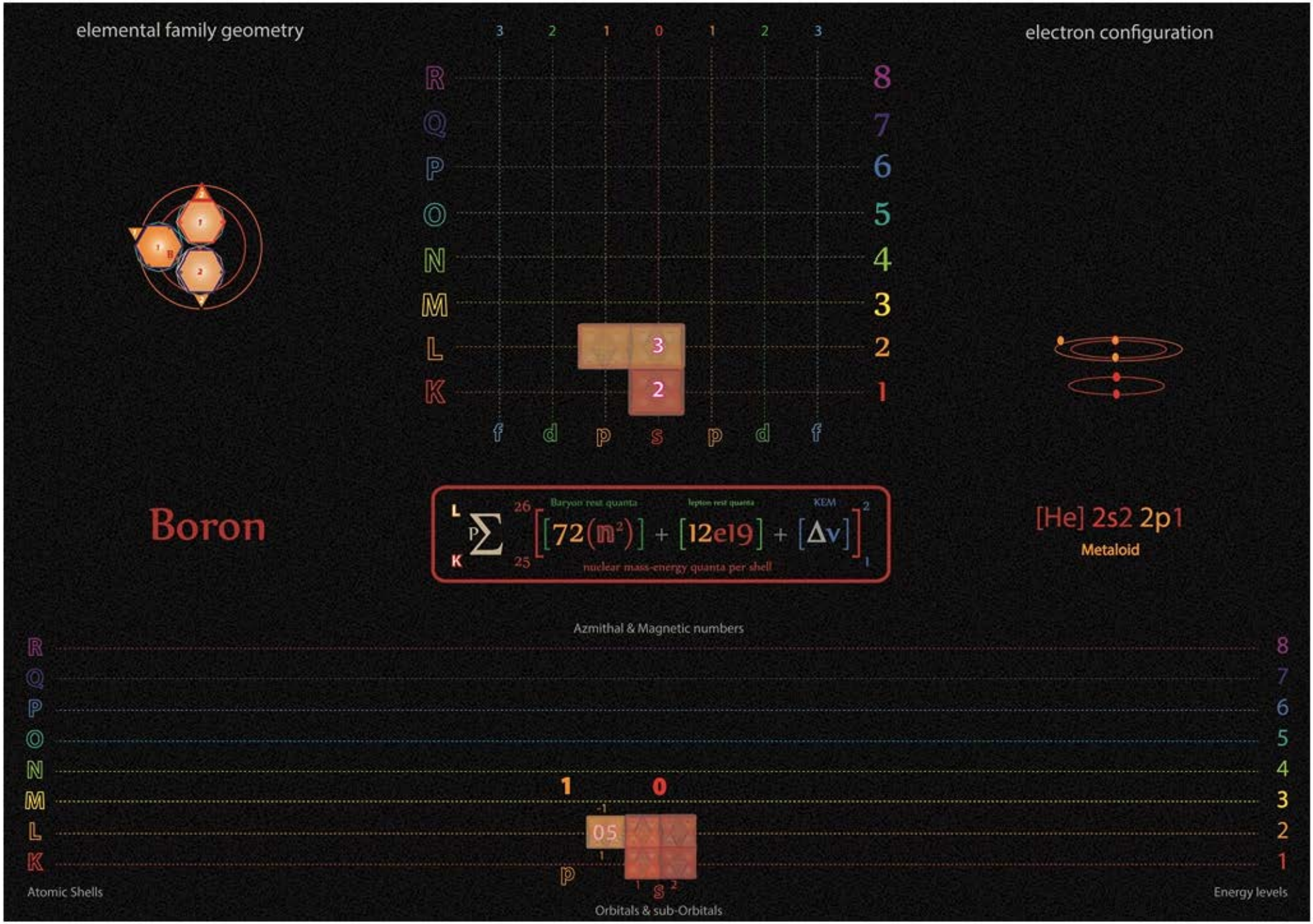

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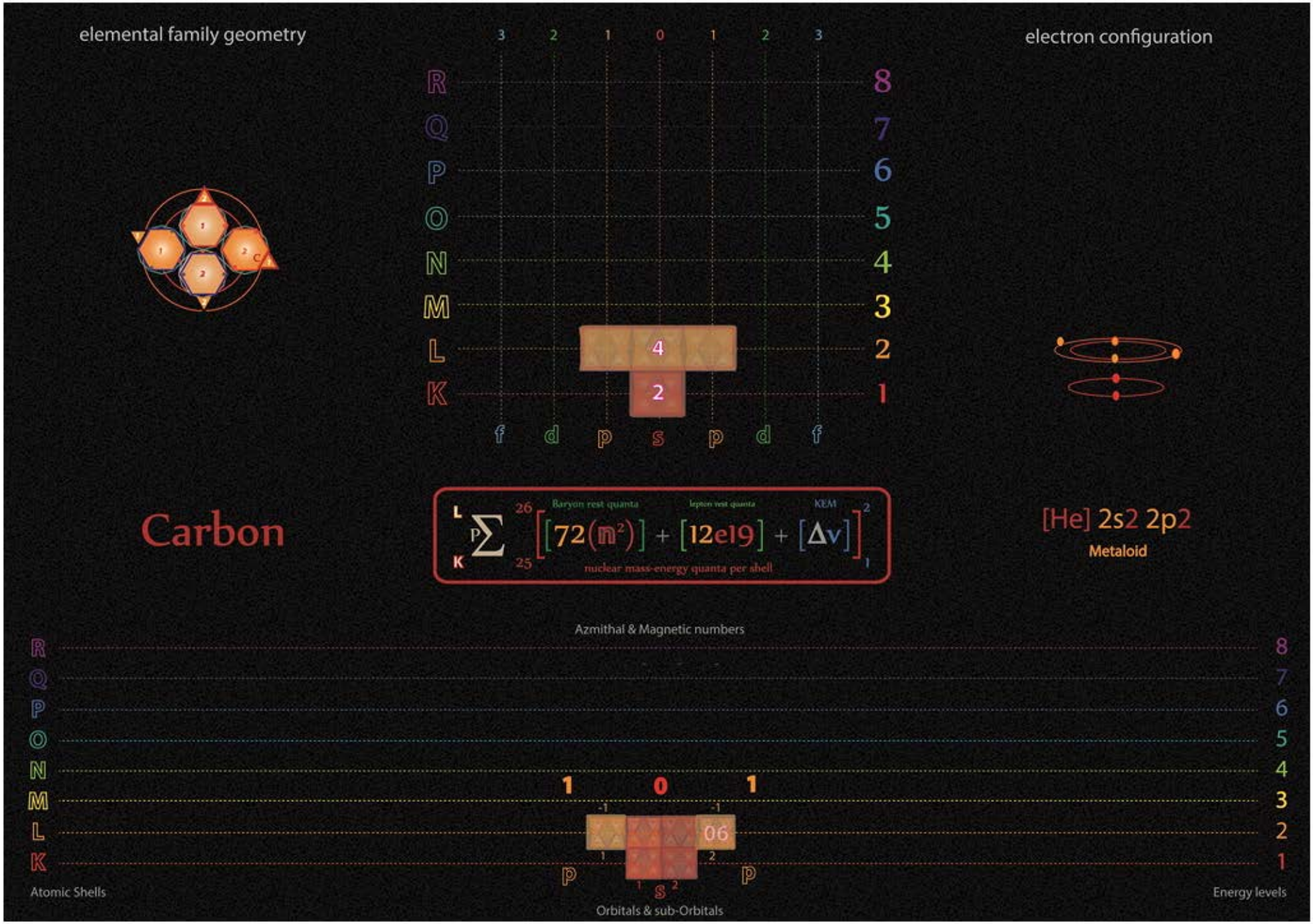

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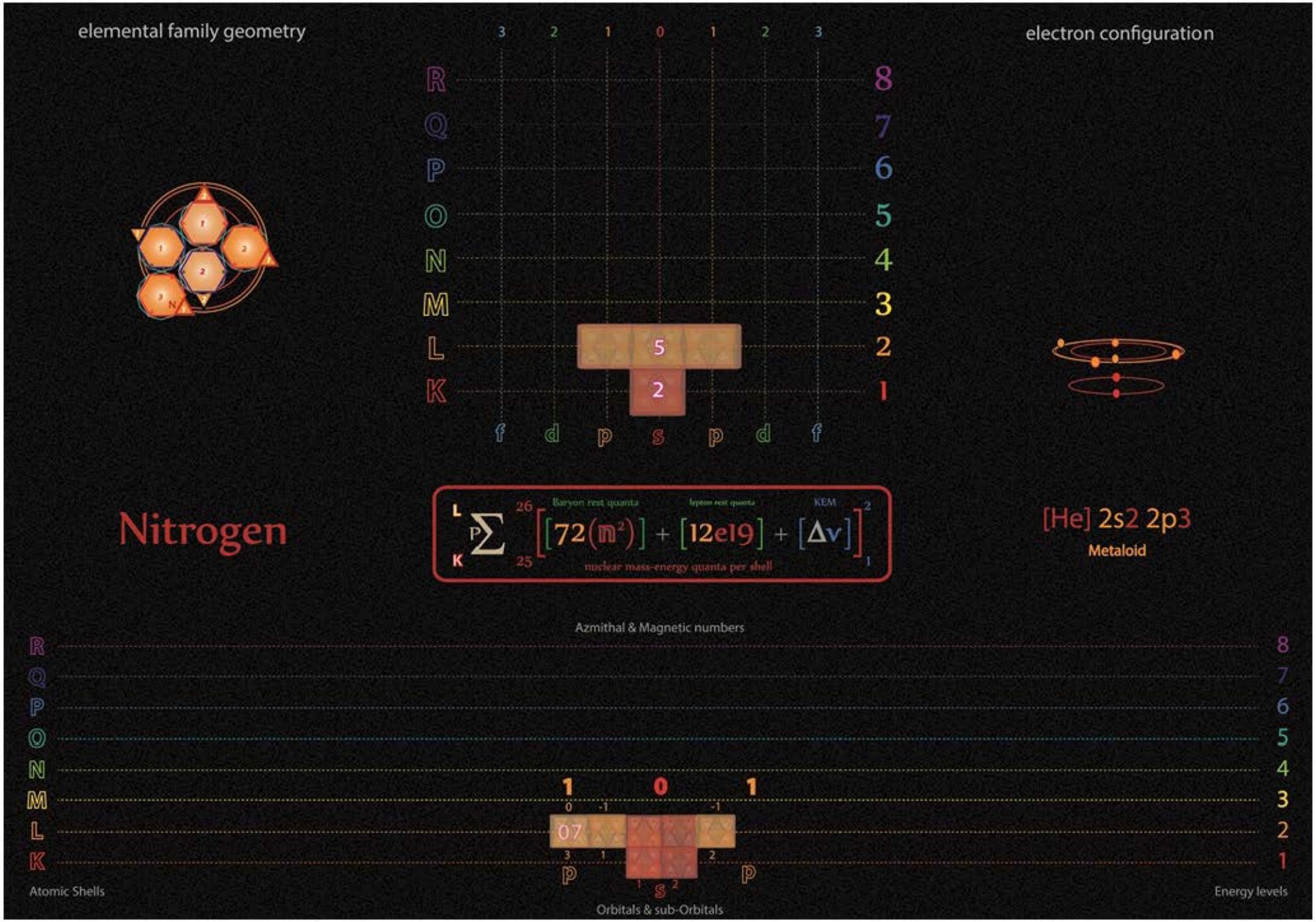

Tetryonics 53.07 - Nitrogen atomic config

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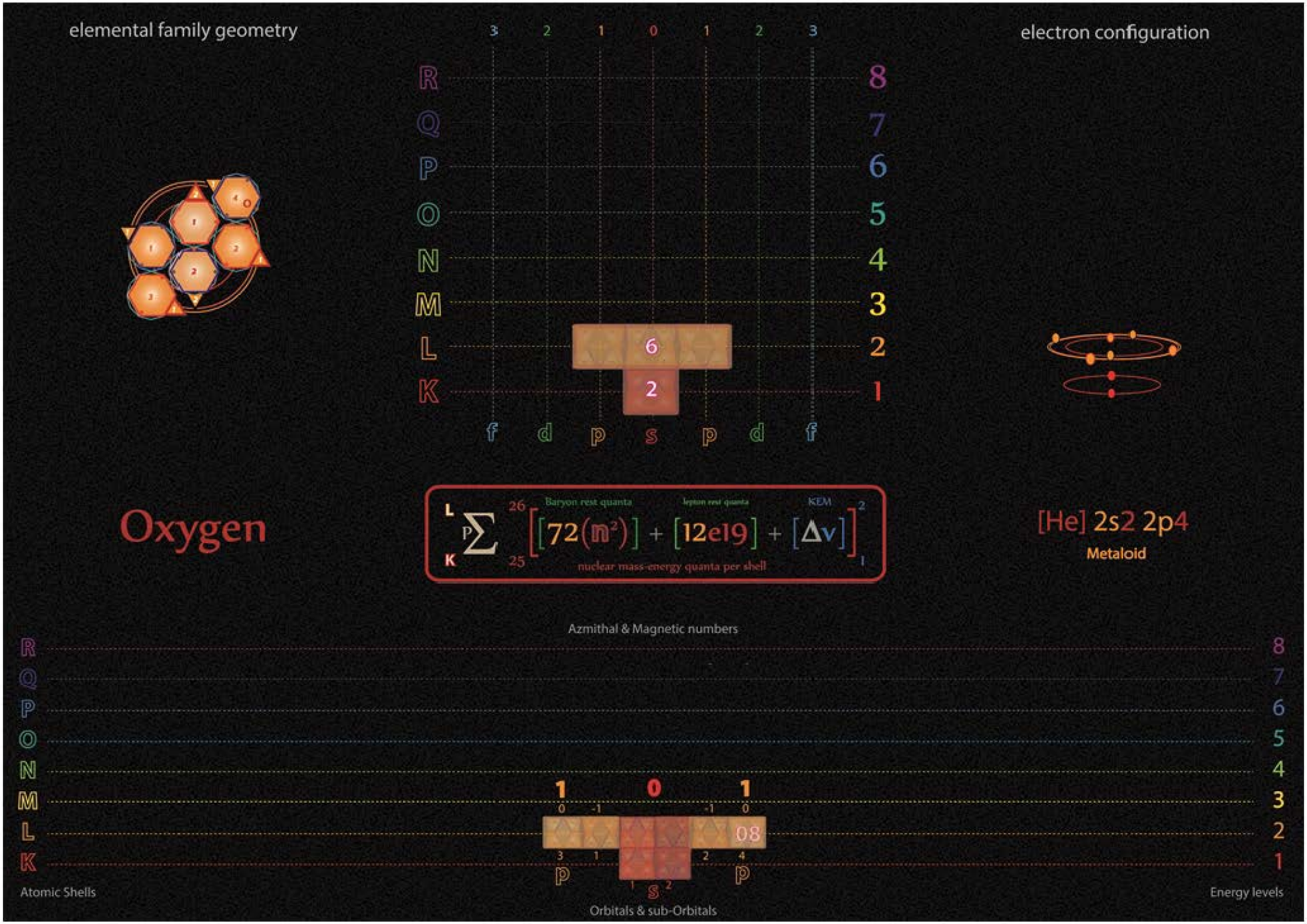

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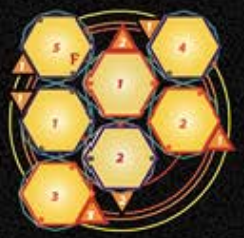
elemental family geometry



electron configuration

Fluorine

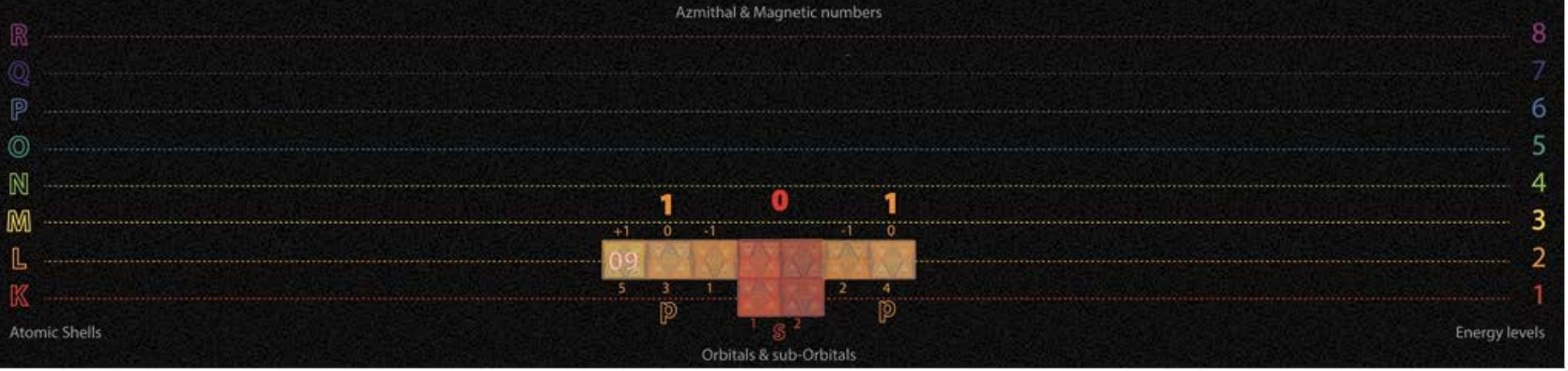
$$\sum_{K}^{L} {}^{P} \sum_{25}^{26} \left[\left[72(n^2) \right] + \left[12e19 \right] + \left[\Delta v \right] \right]_{1}^{2}$$

Baryon rest quanta · lepton rest quanta · KEM

nuclear mass-energy quanta per shell

[He] 2s2 2p5

Halogen



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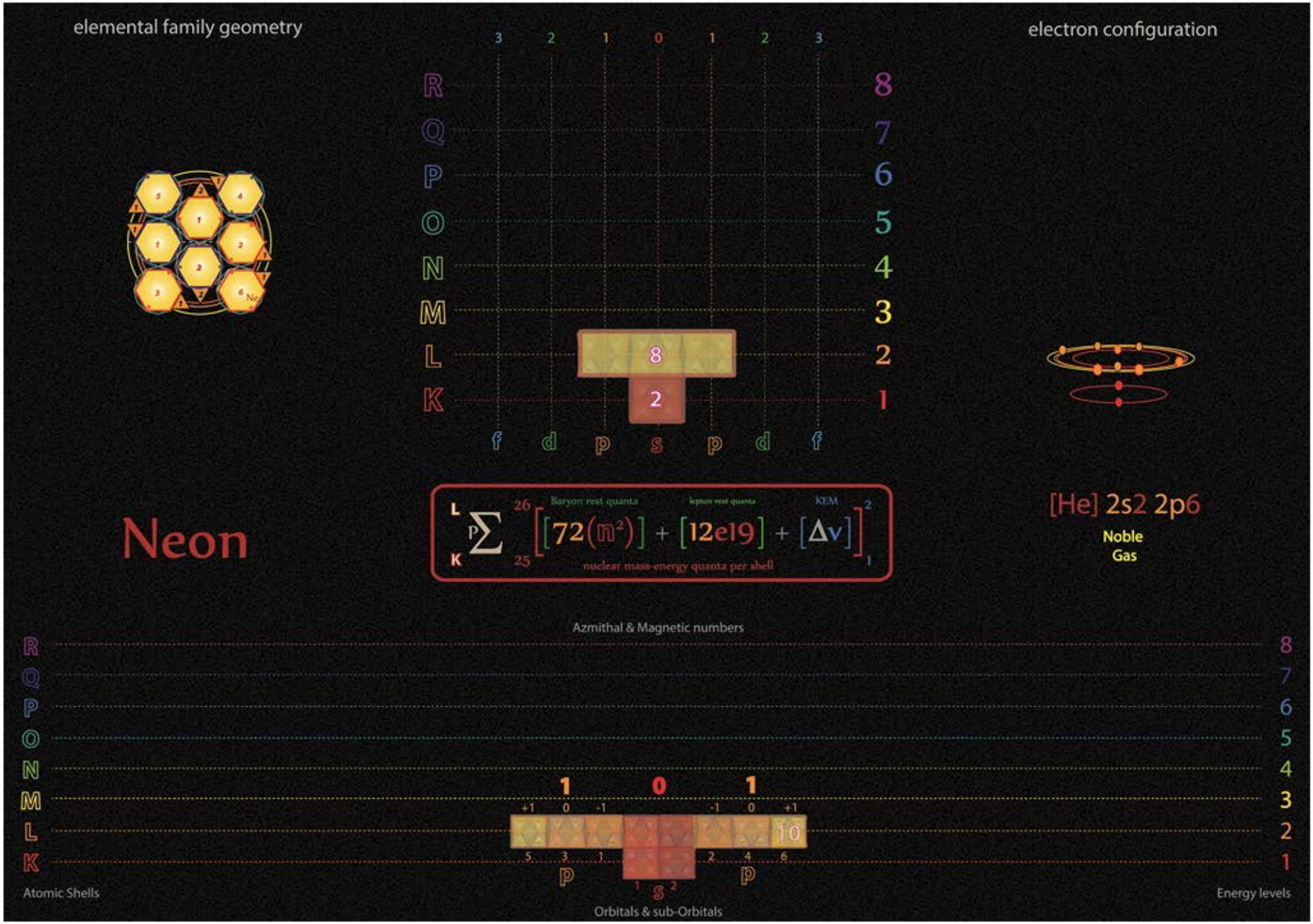

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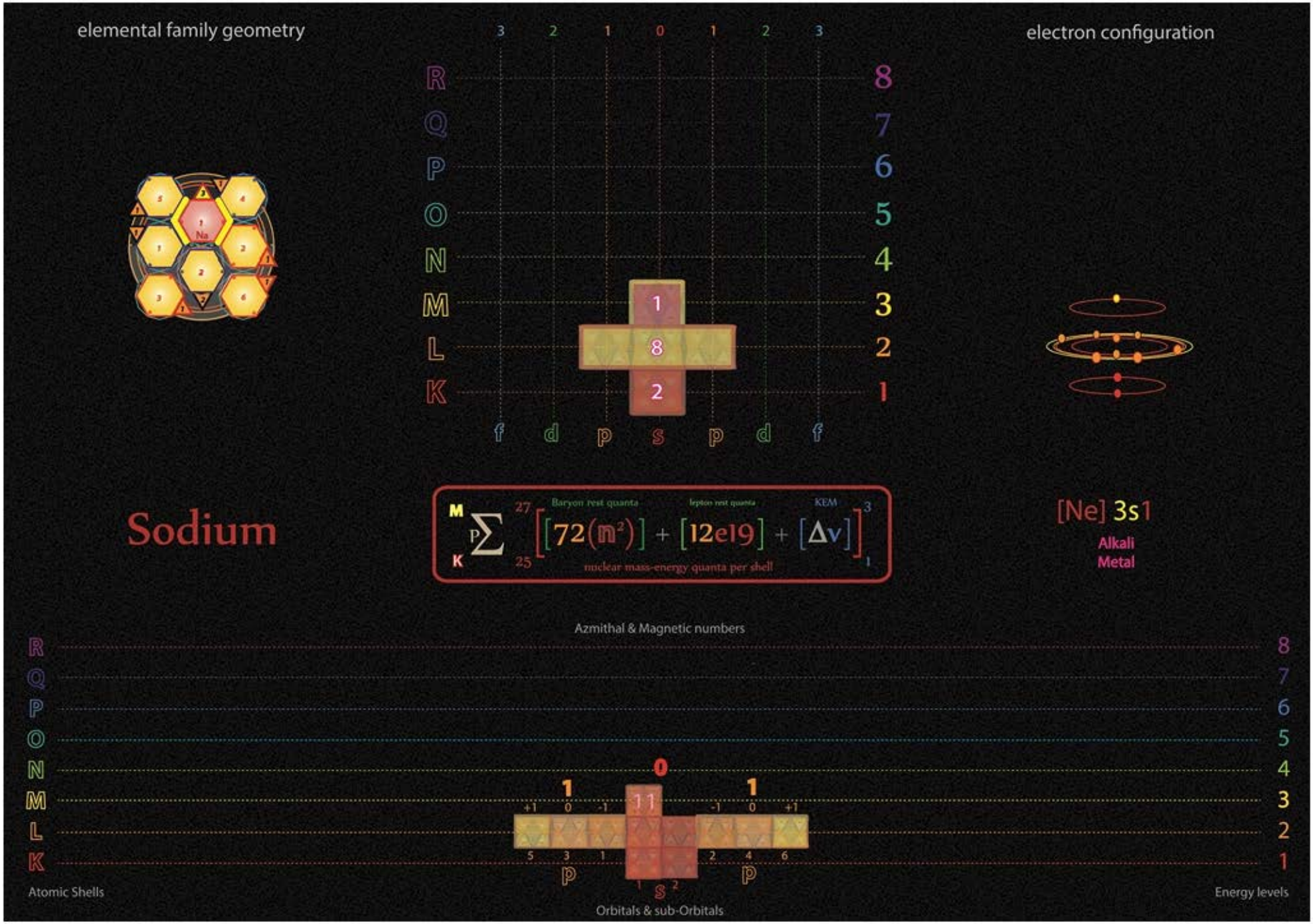

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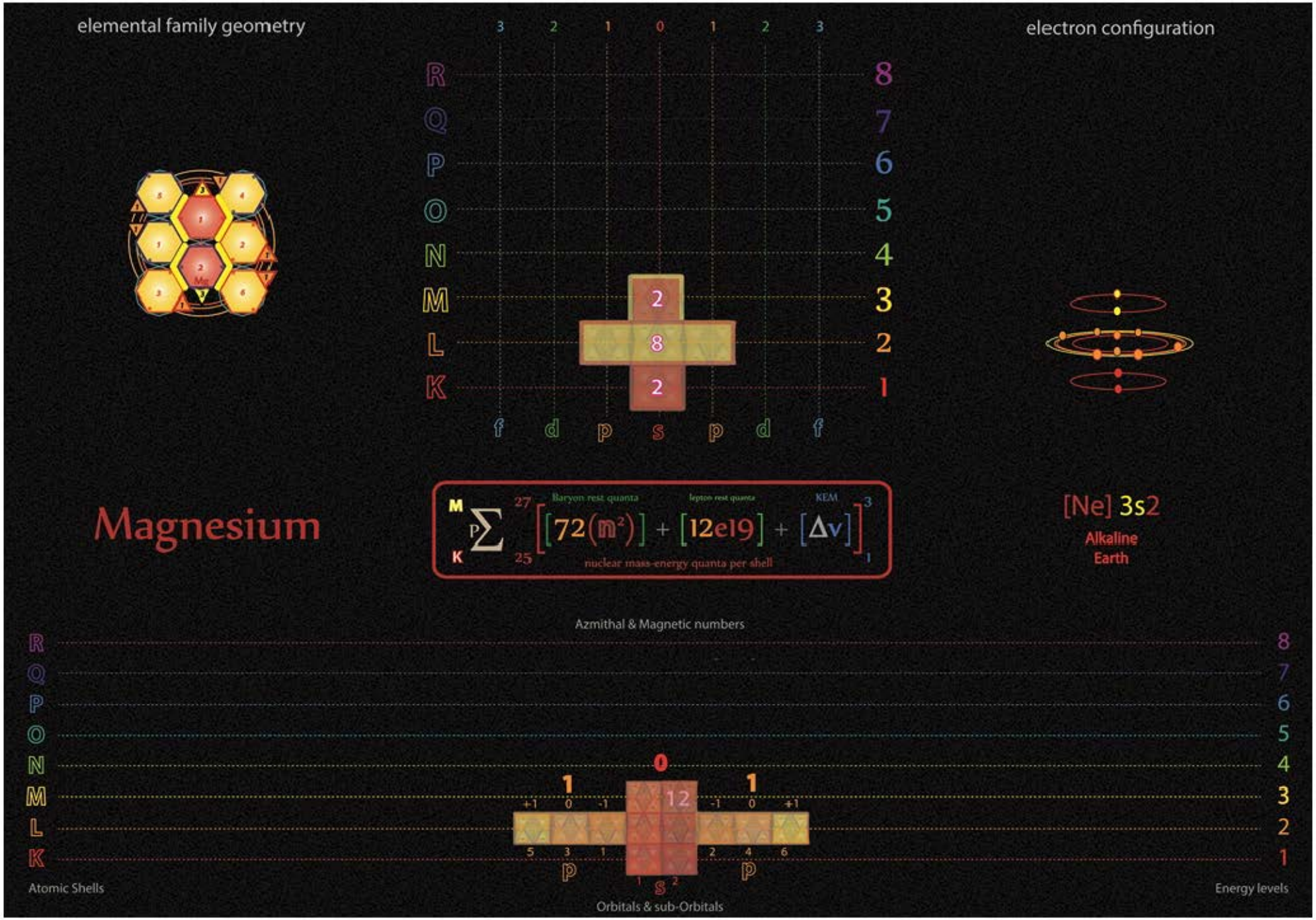

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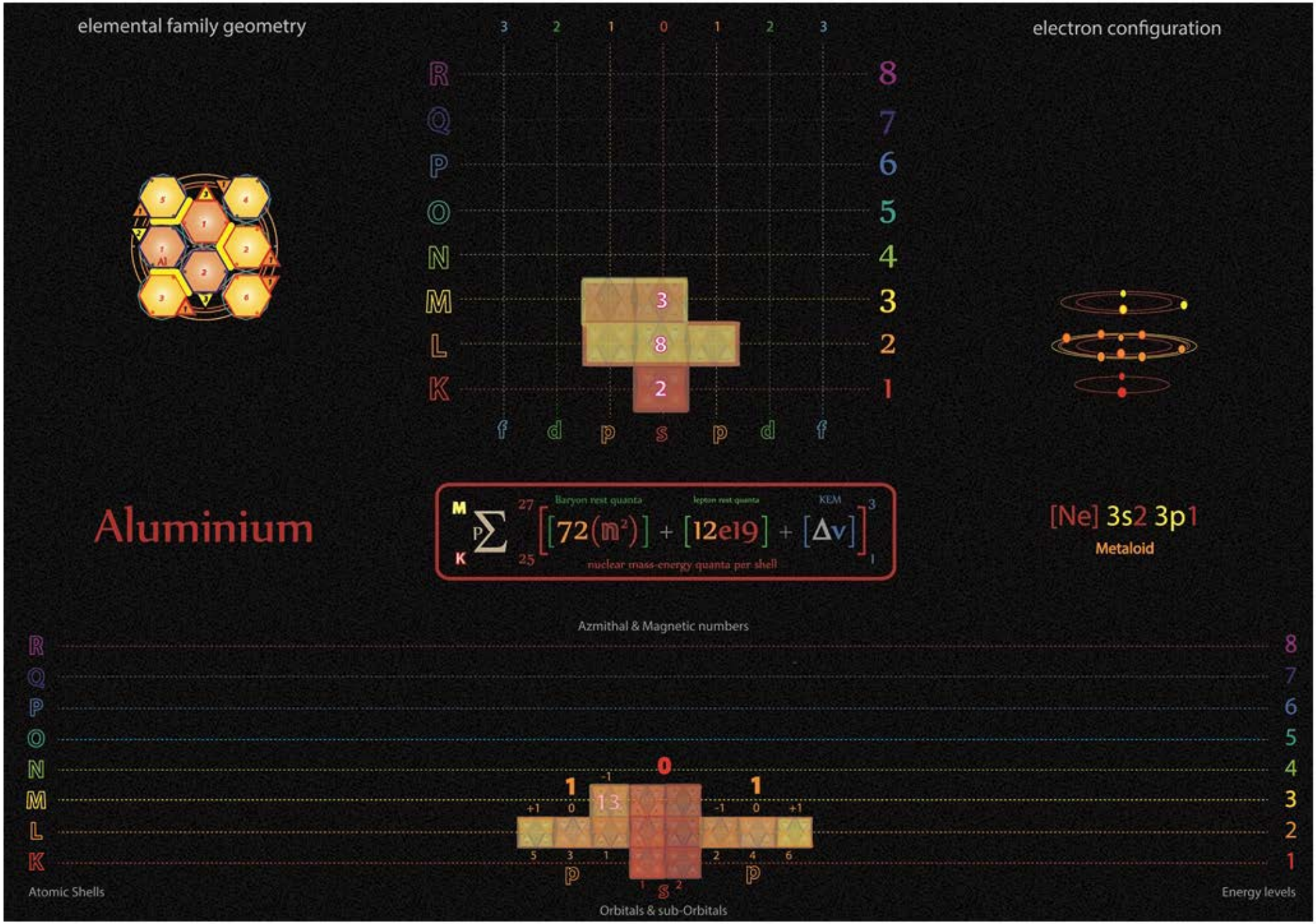

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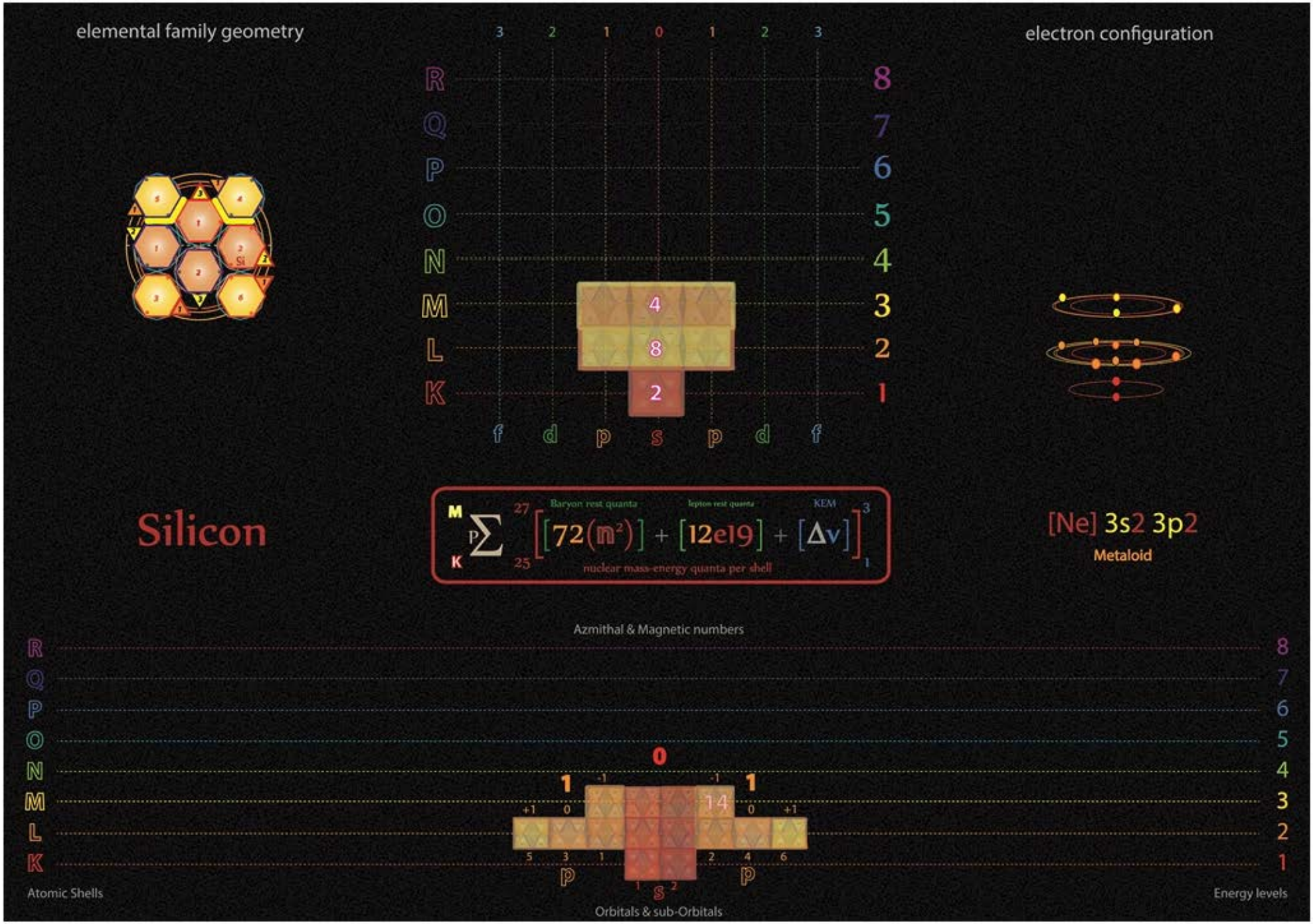

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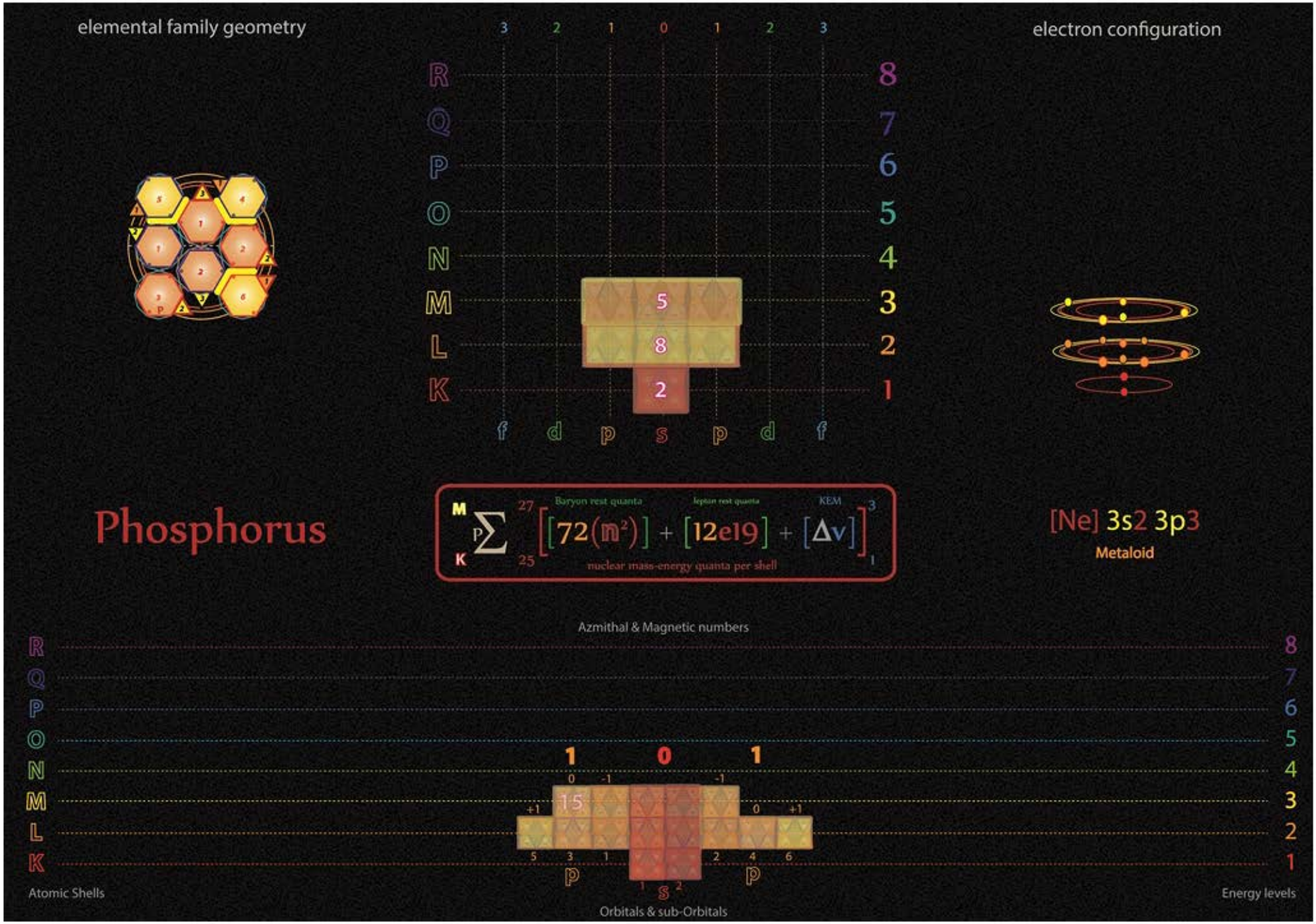

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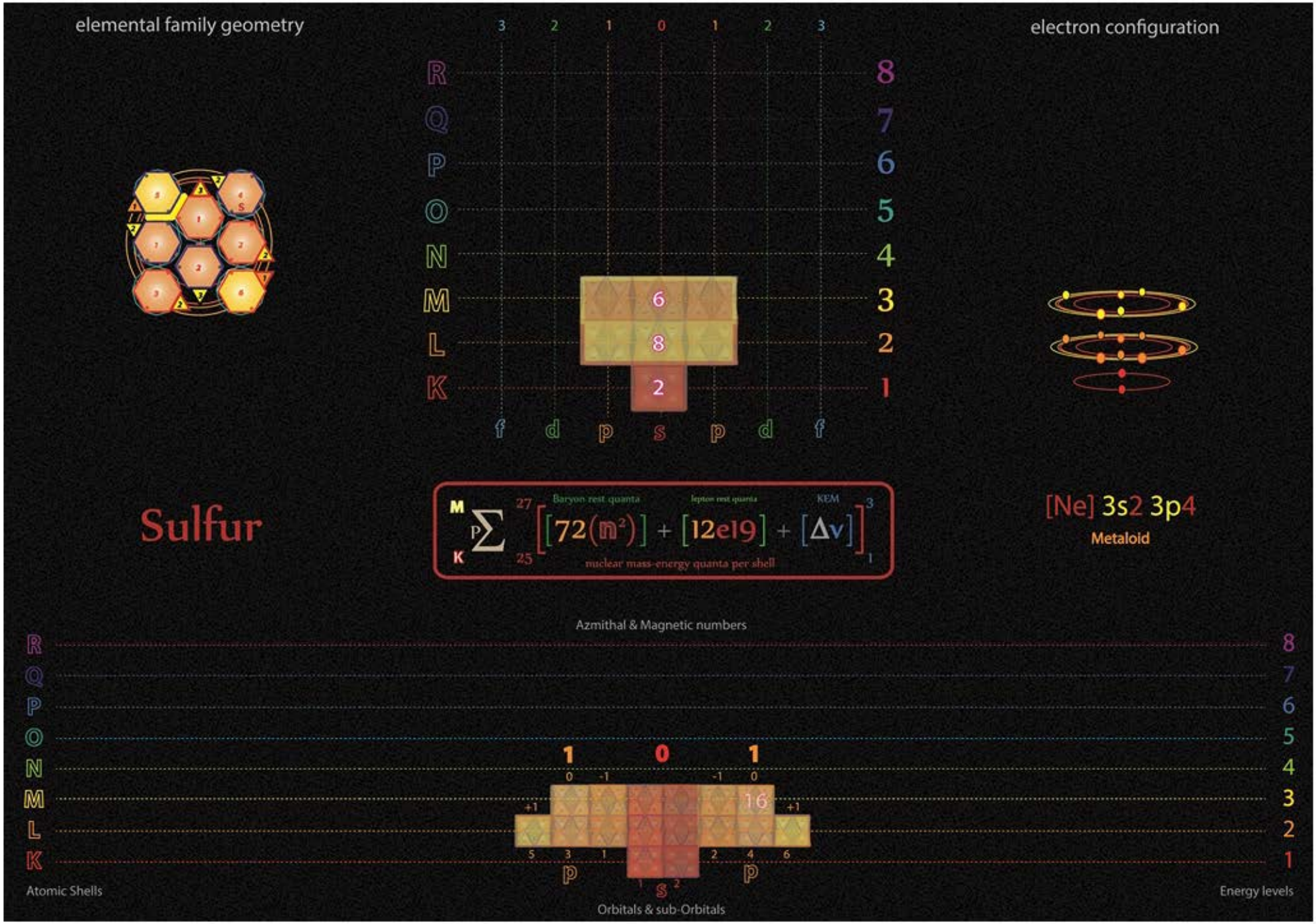

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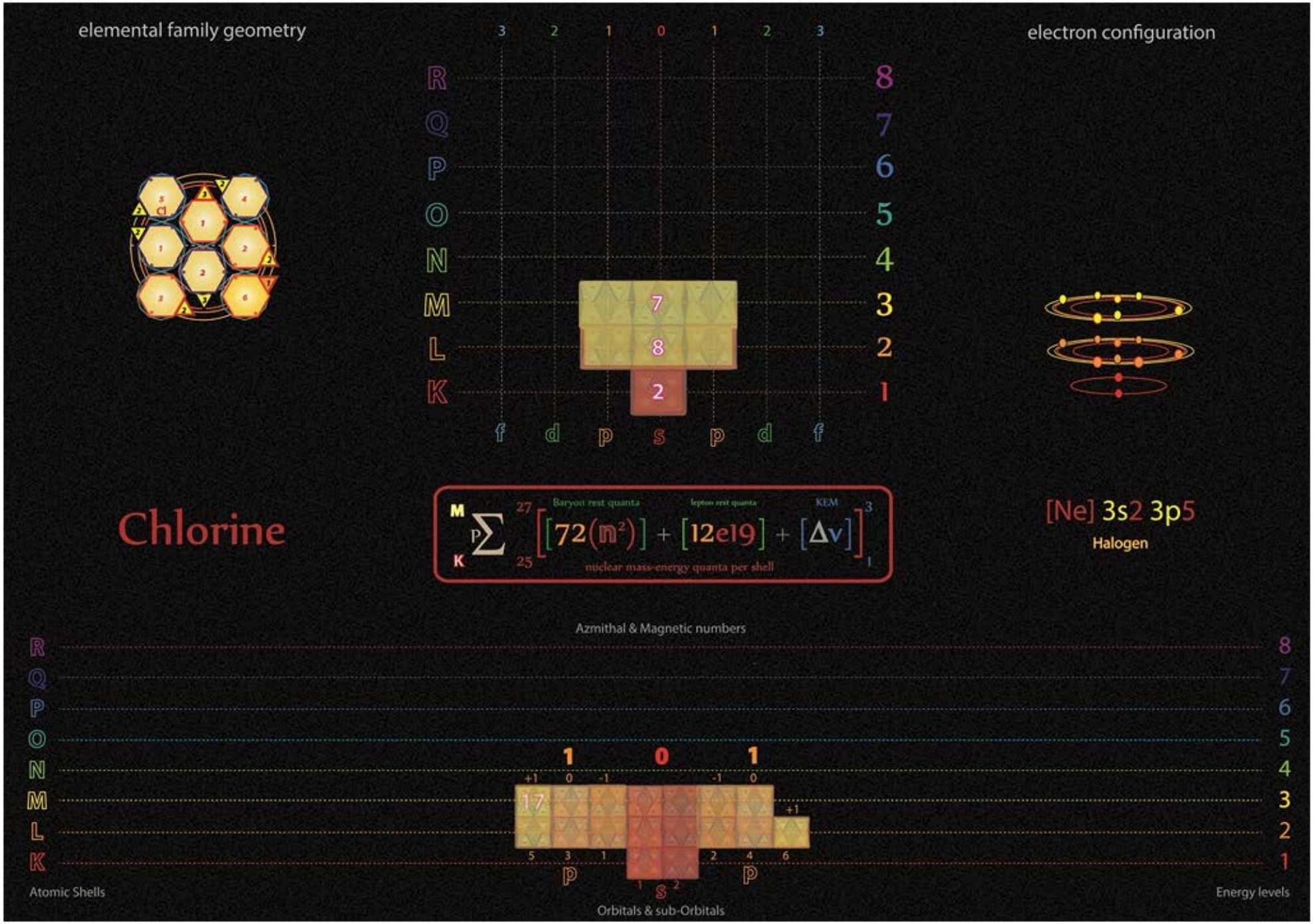

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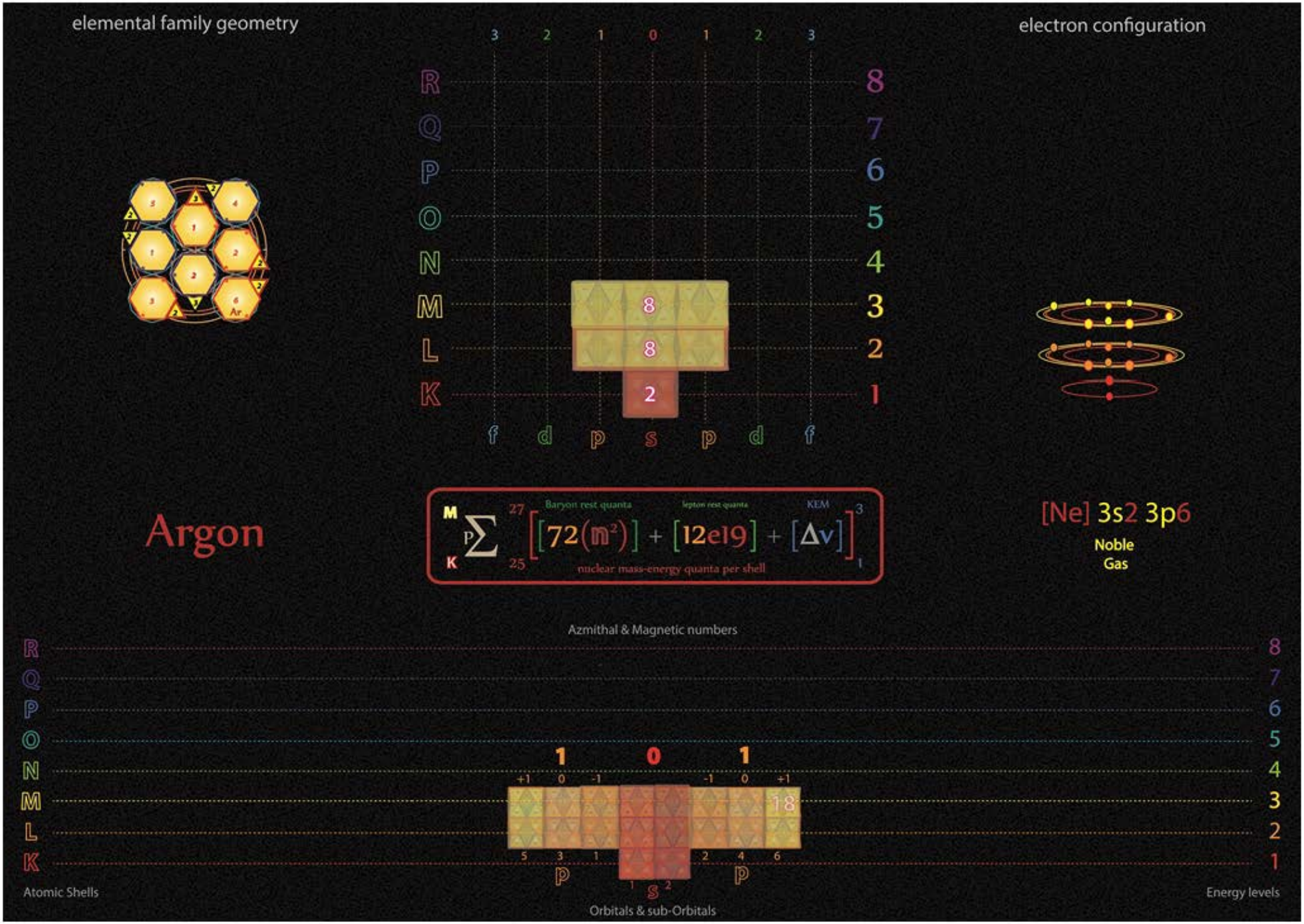

Tetryonics 53.18 - Argon atomic config

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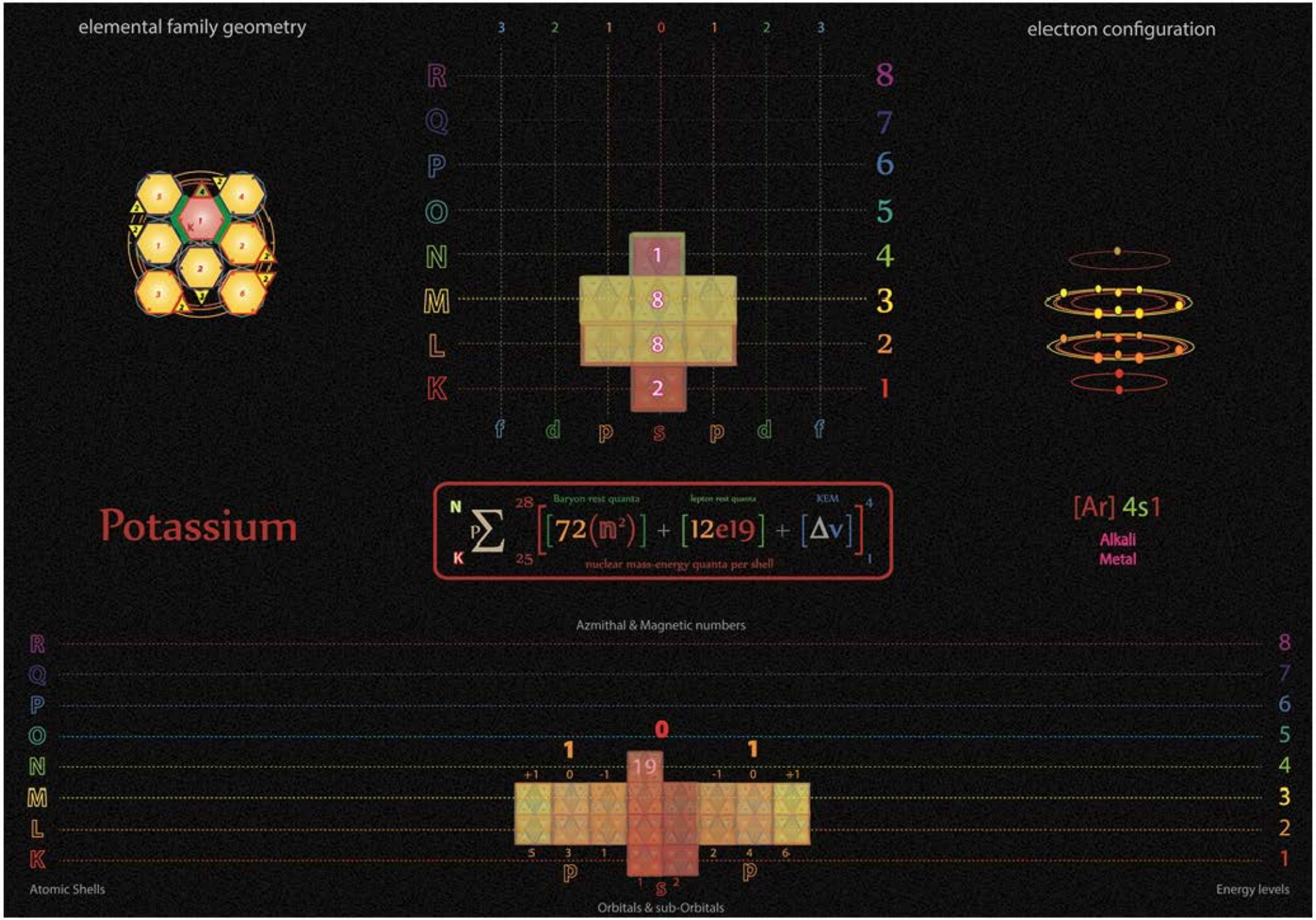

Tetryonics 53.19 - Potassium atomic config

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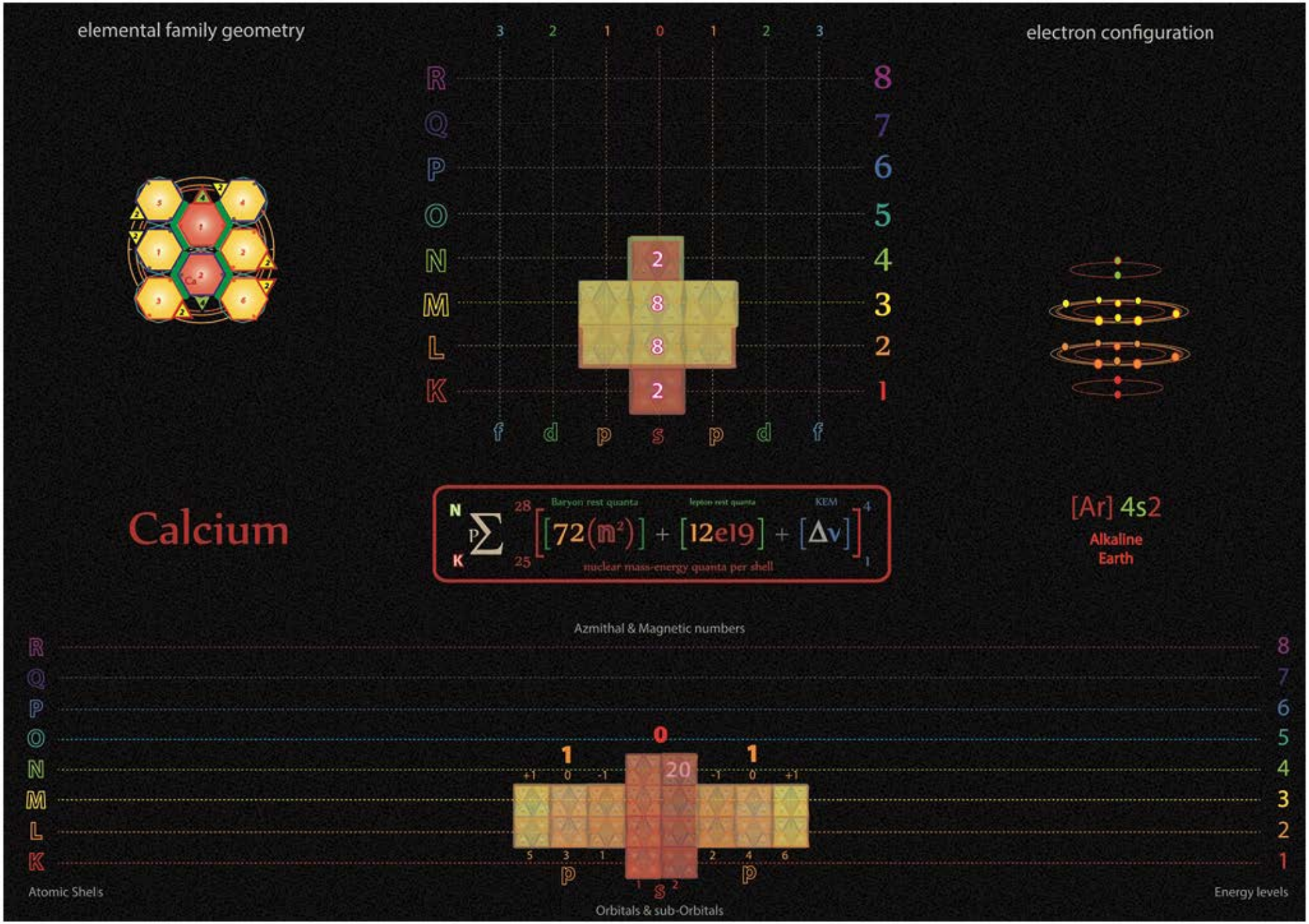

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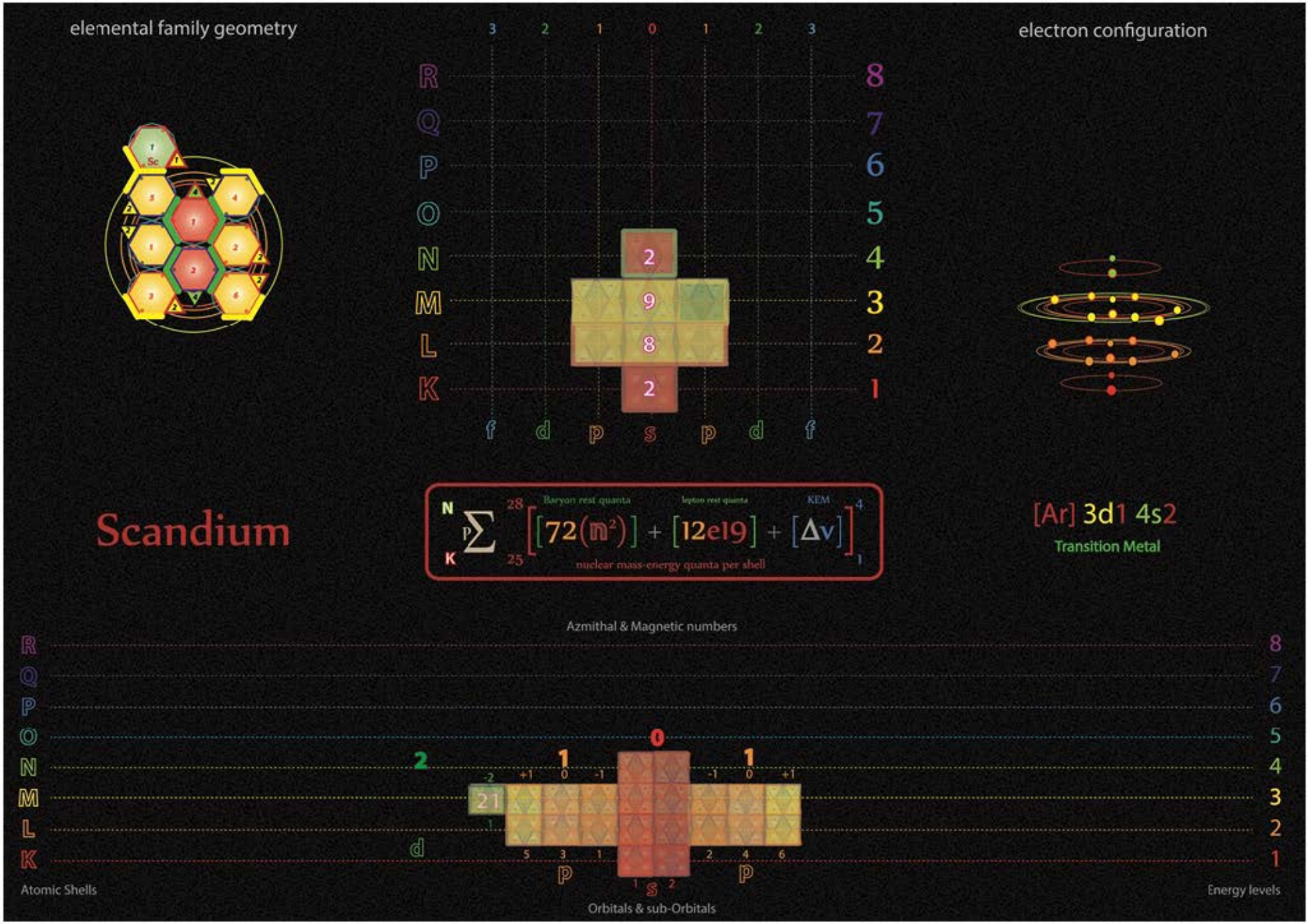

Tetryonics 53.21 - Scandium atomic config

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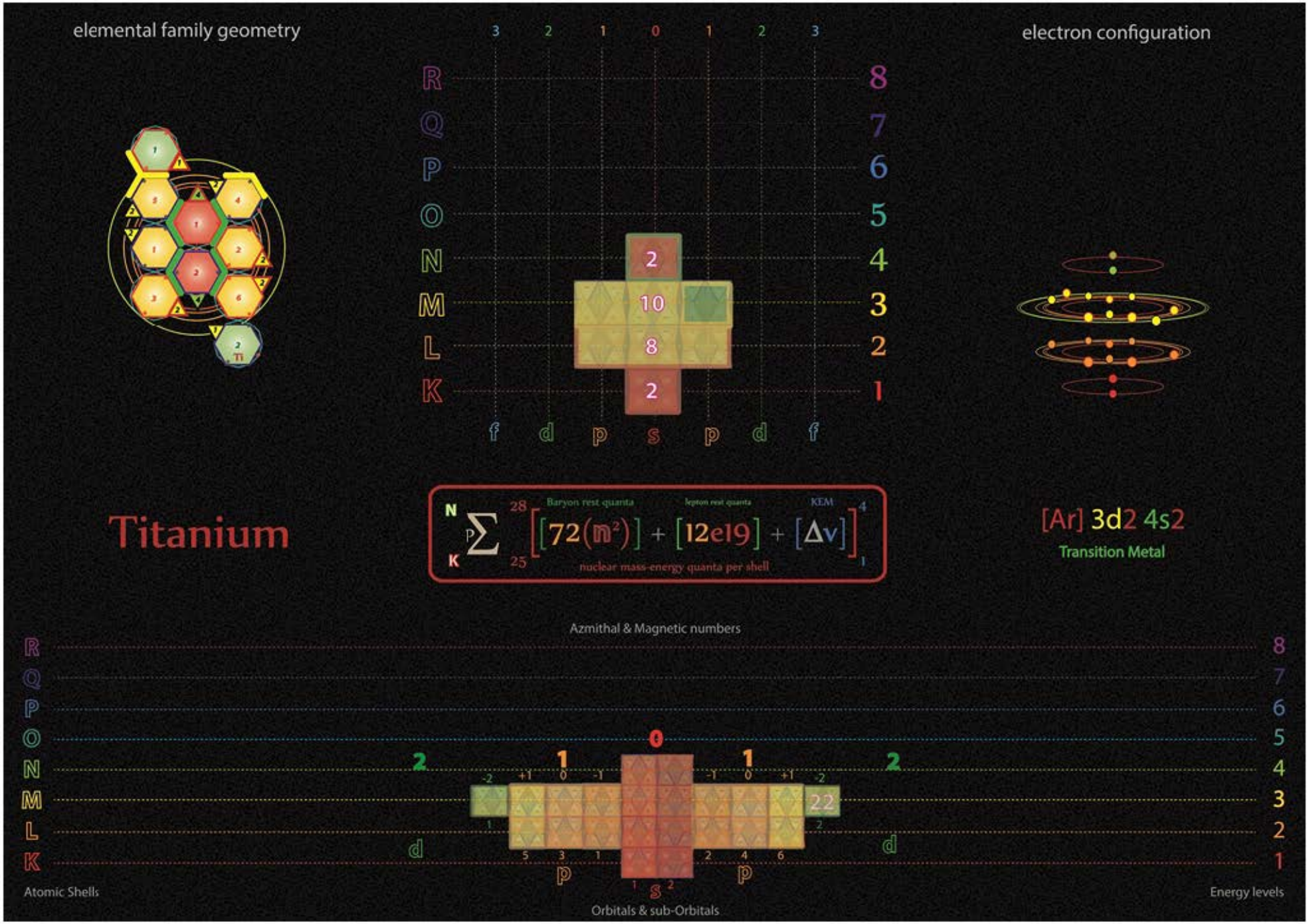

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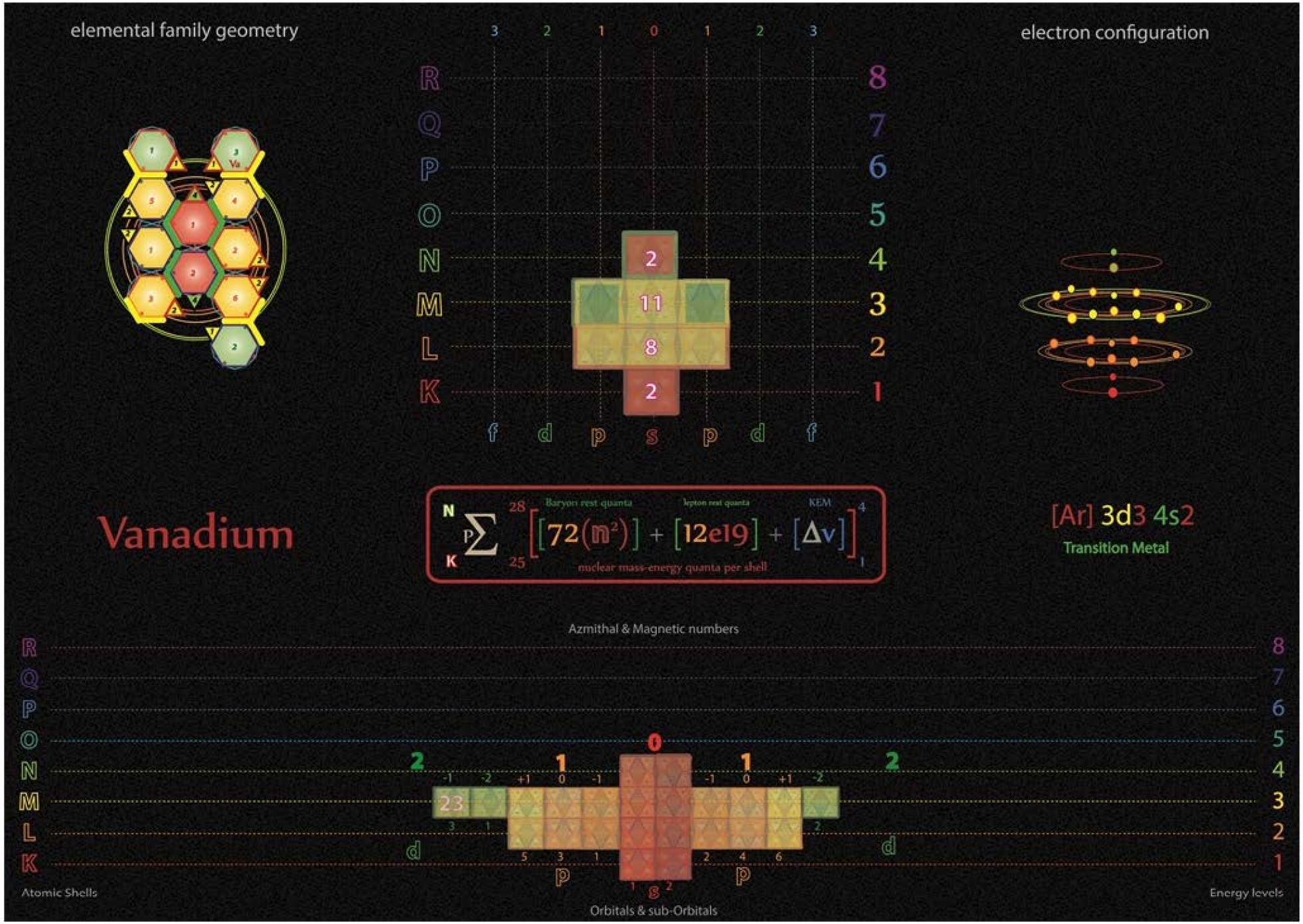

Tetryonics 53.23 - Vanadium atomic config

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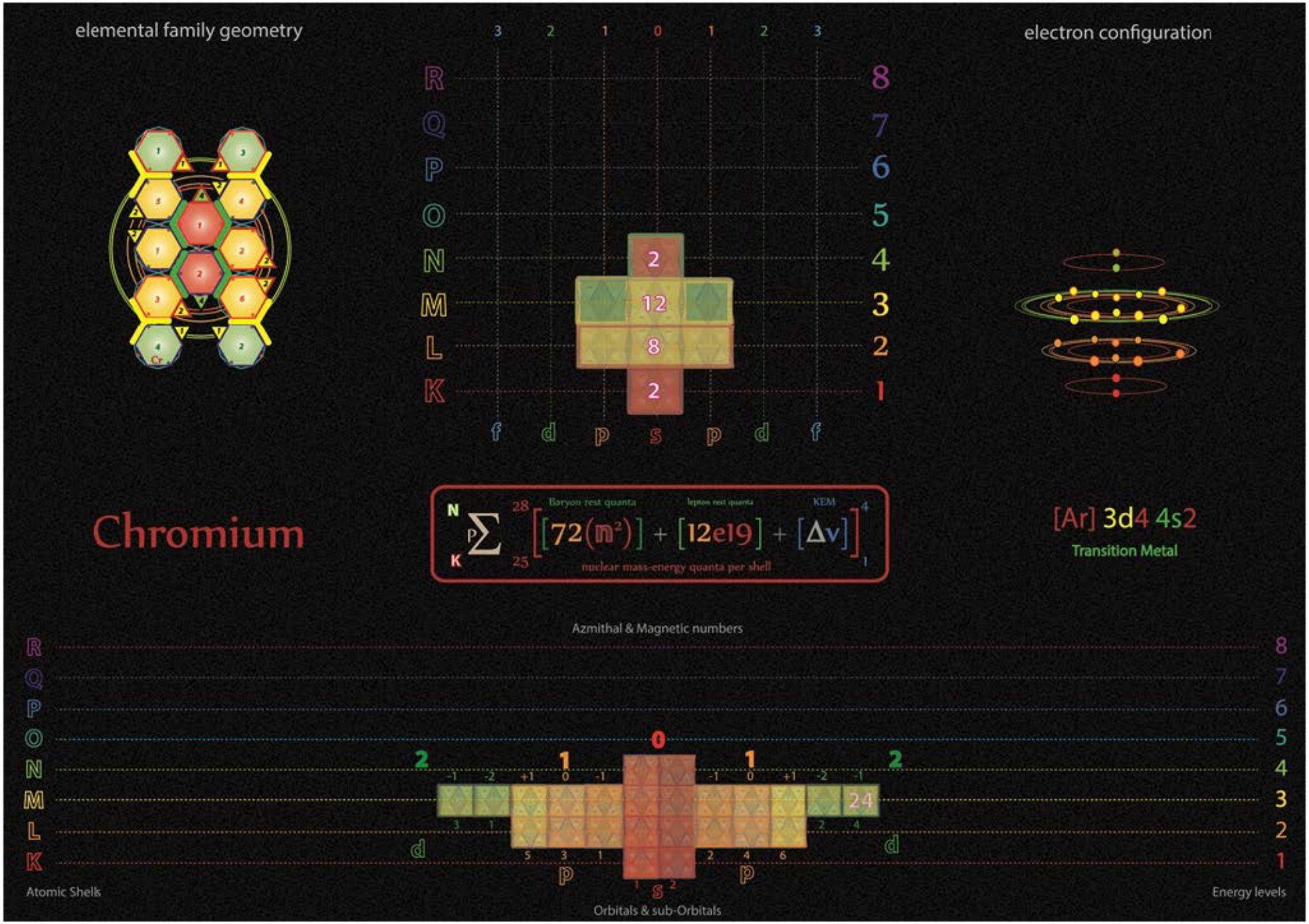

Tetryonics 53.24 - Chromium atomic config

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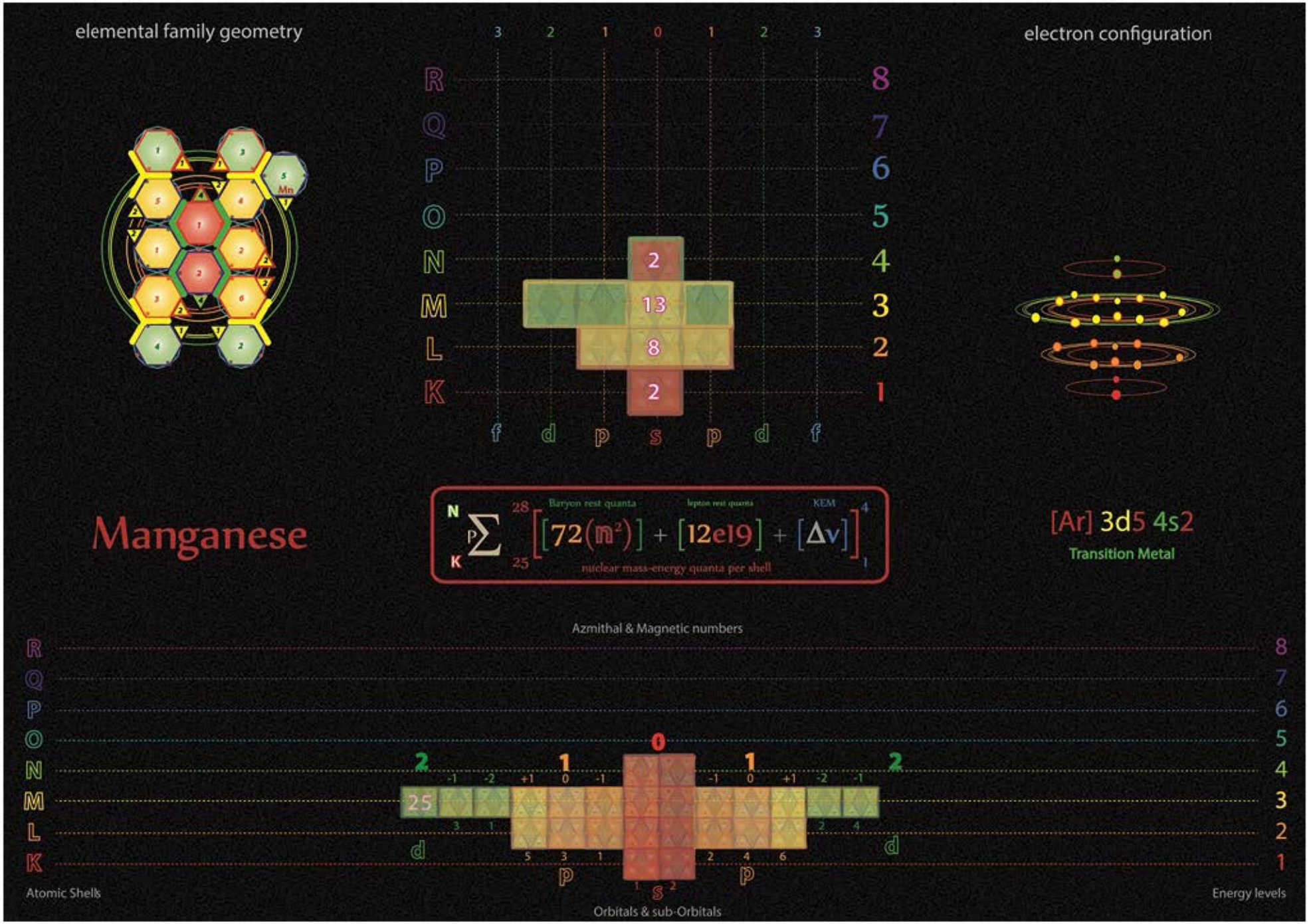

Tetryonics 53.25 - Manganese atomic config

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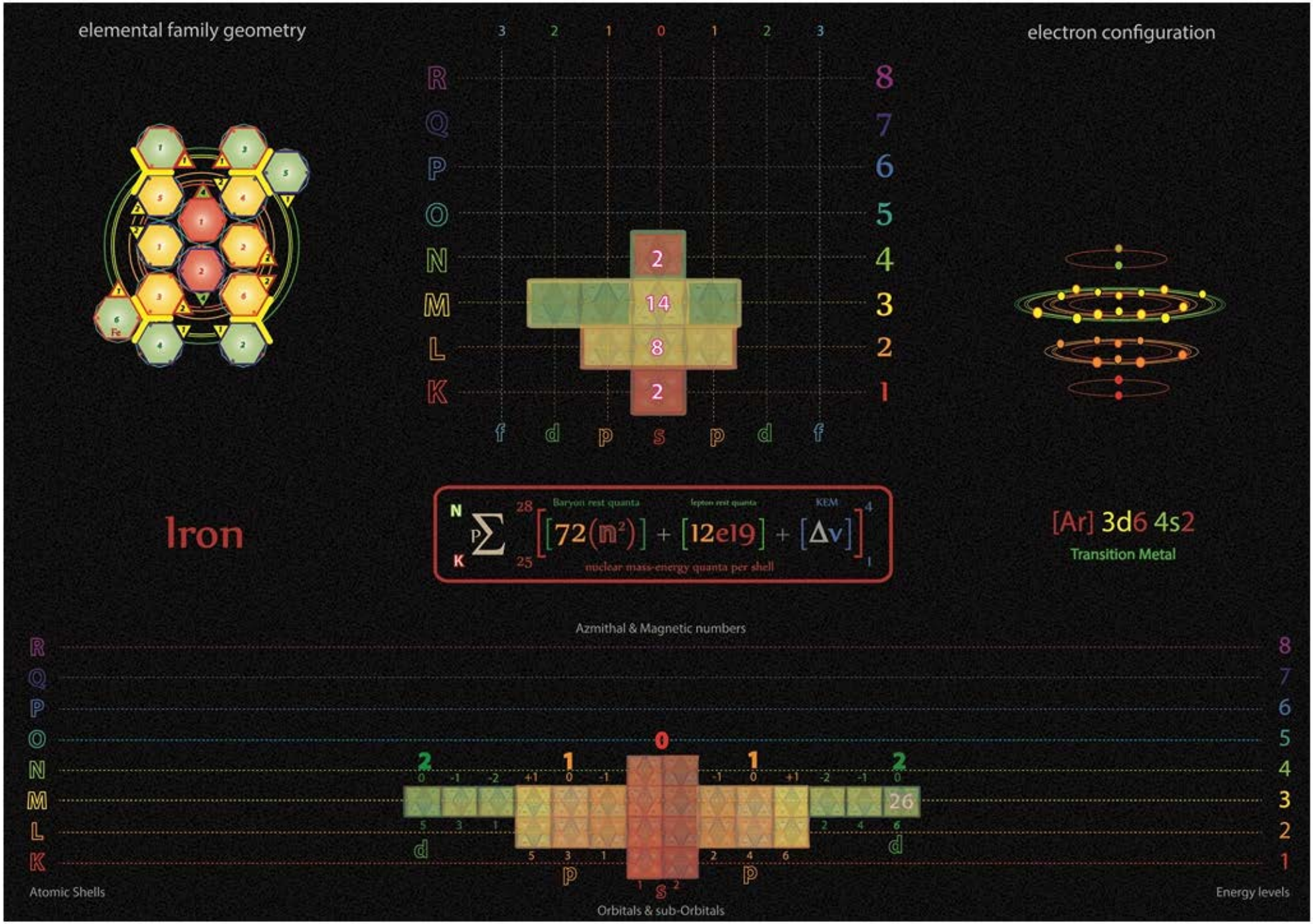

Tetryonics 53.26 - Iron atomic config

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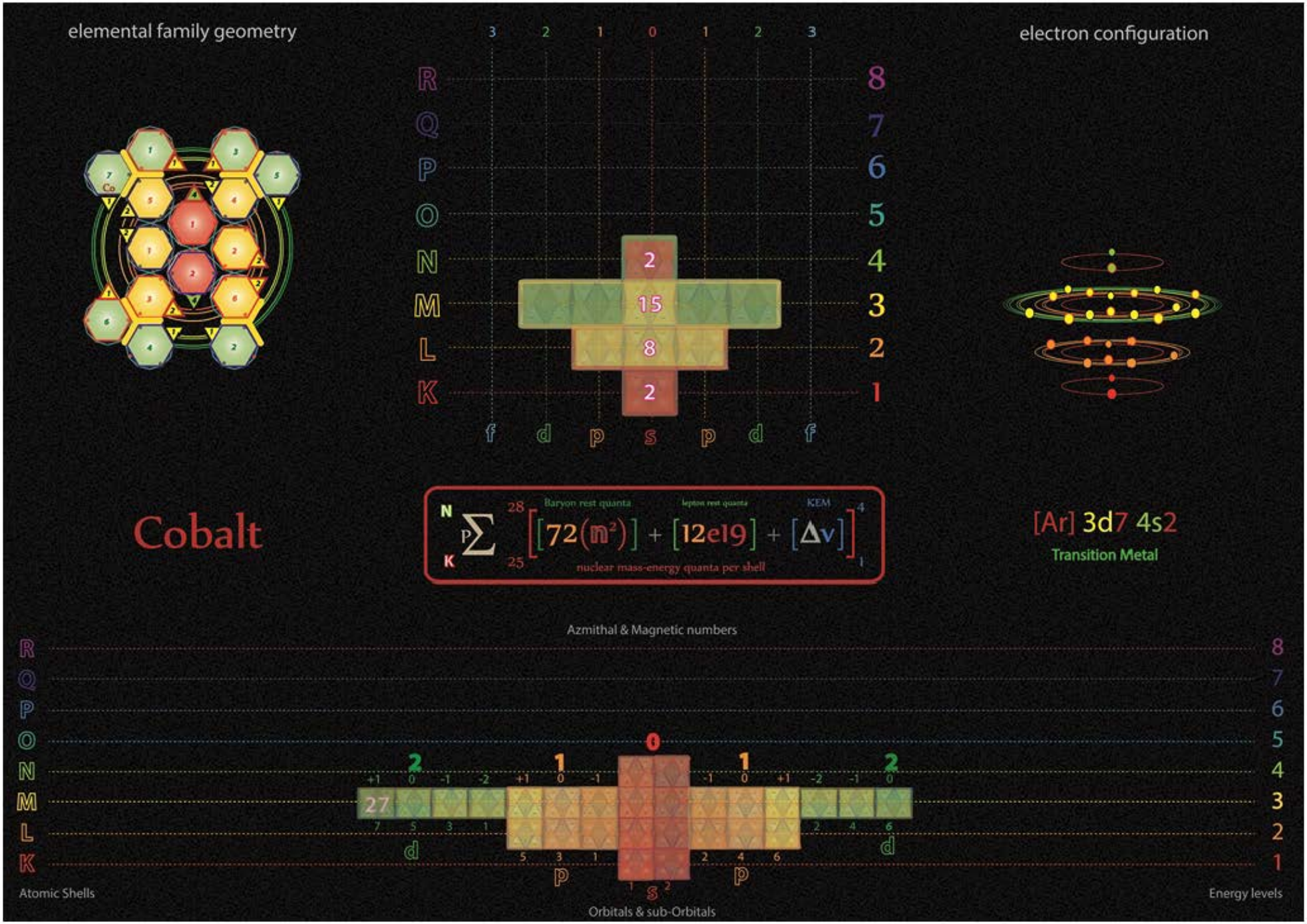

Tetryonics 53.27 - Cobalt atomic config

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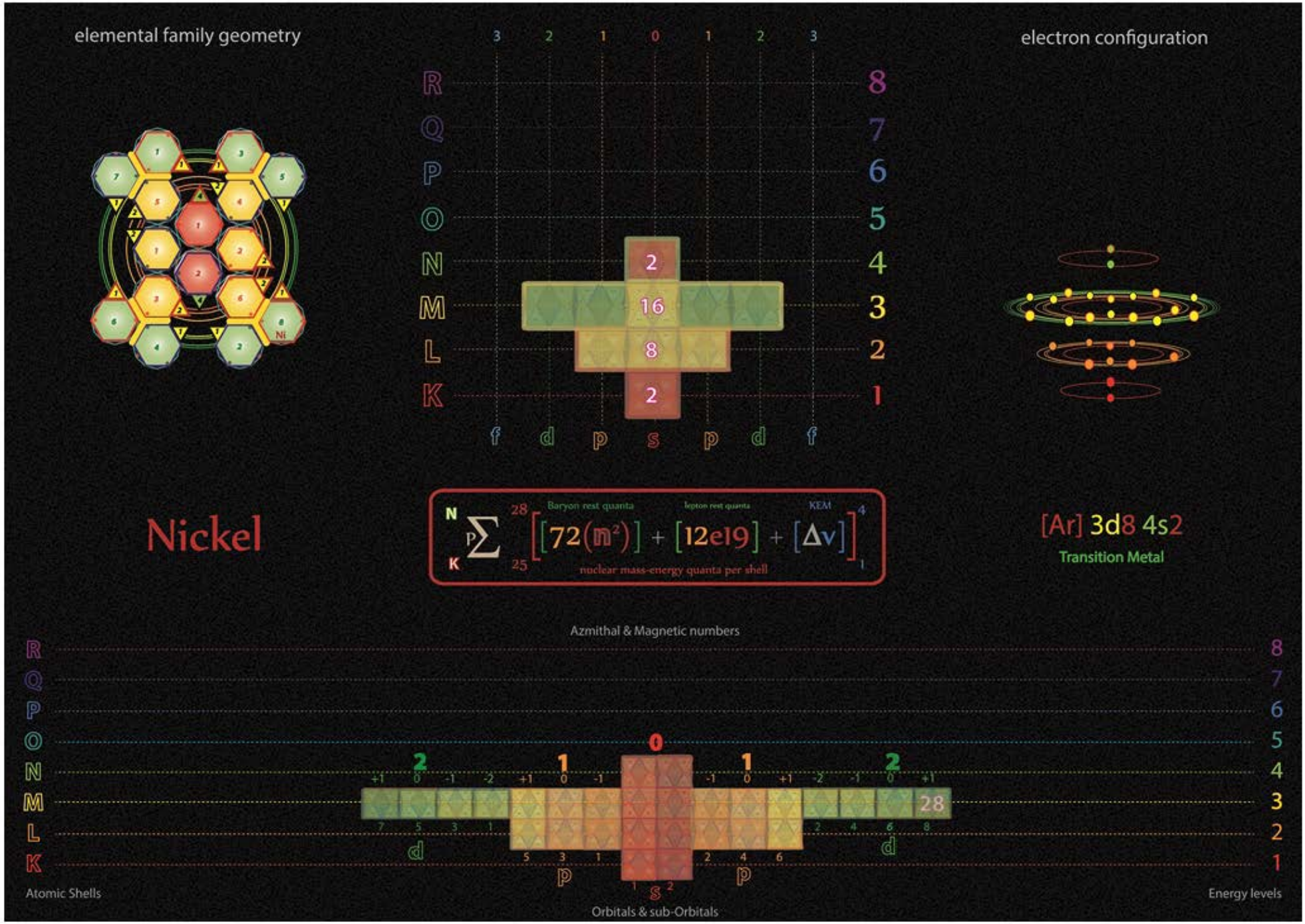

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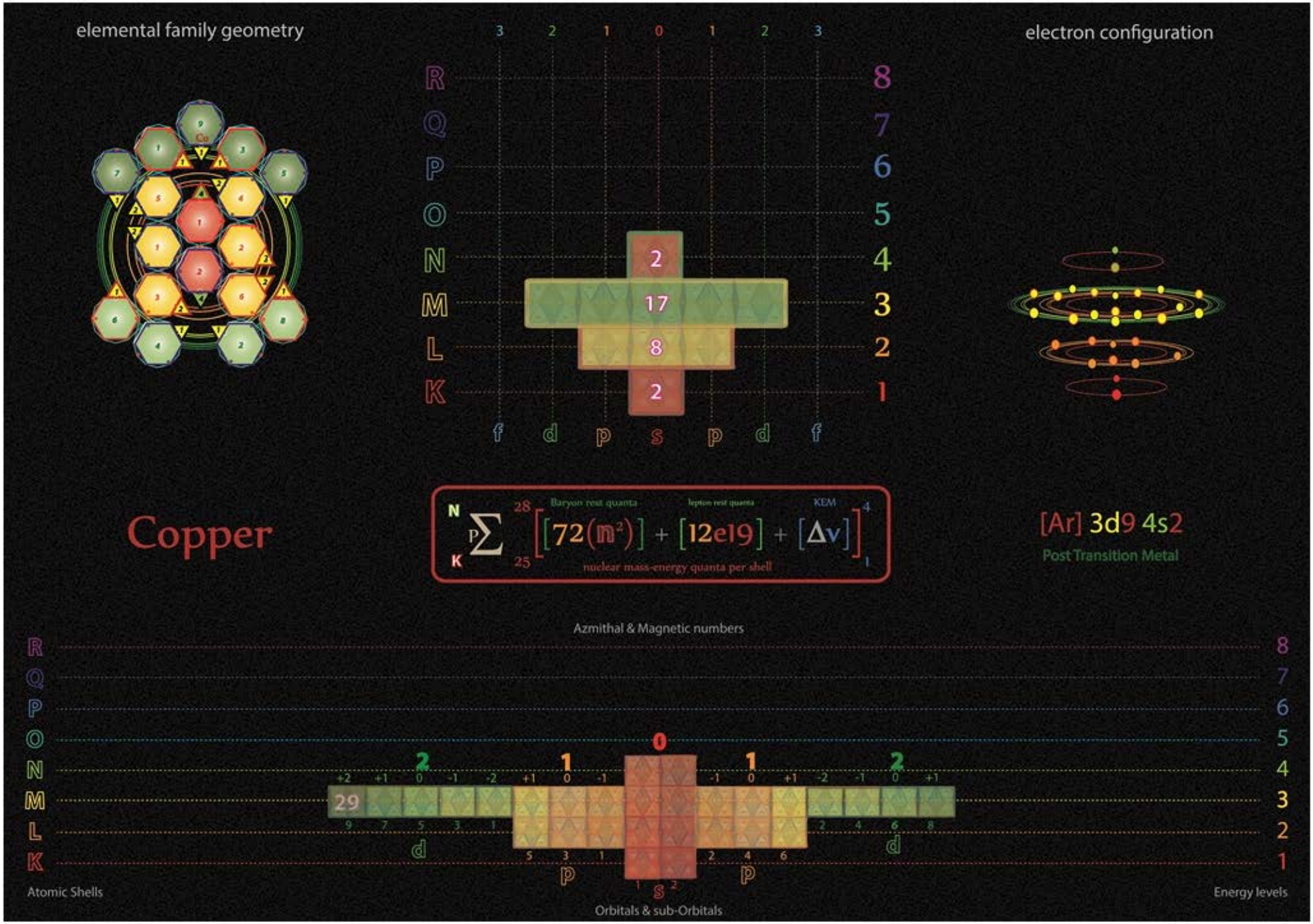

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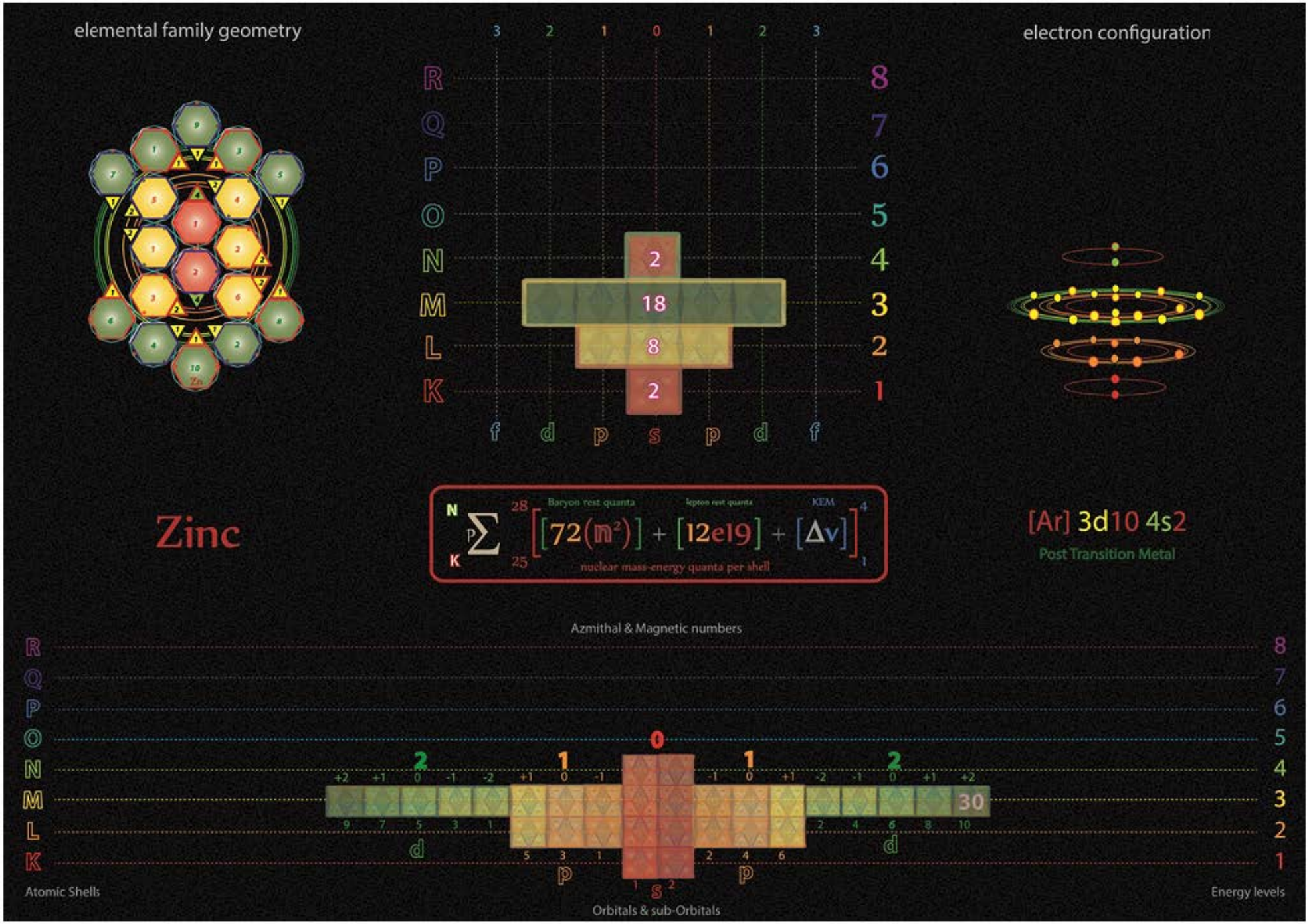

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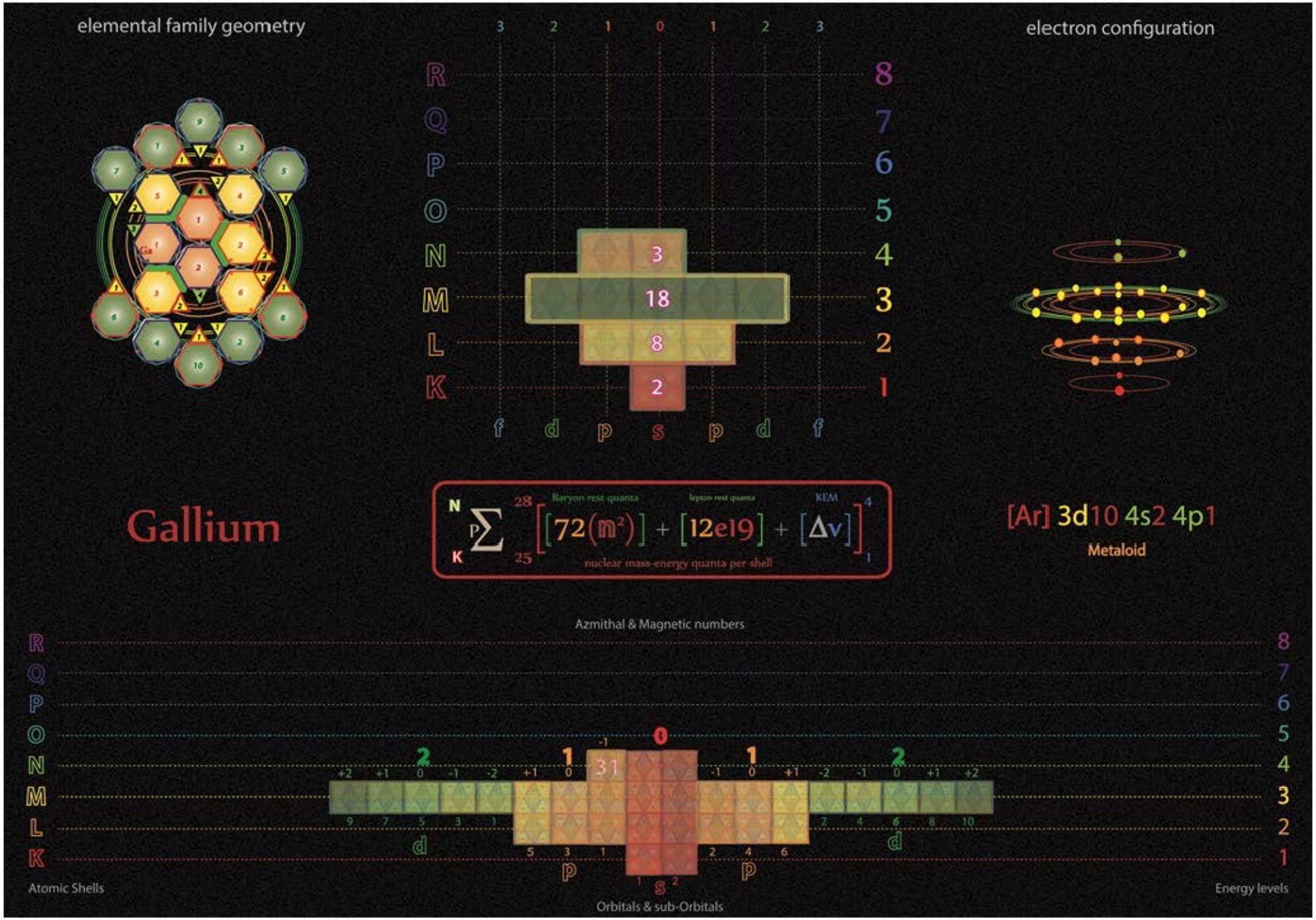

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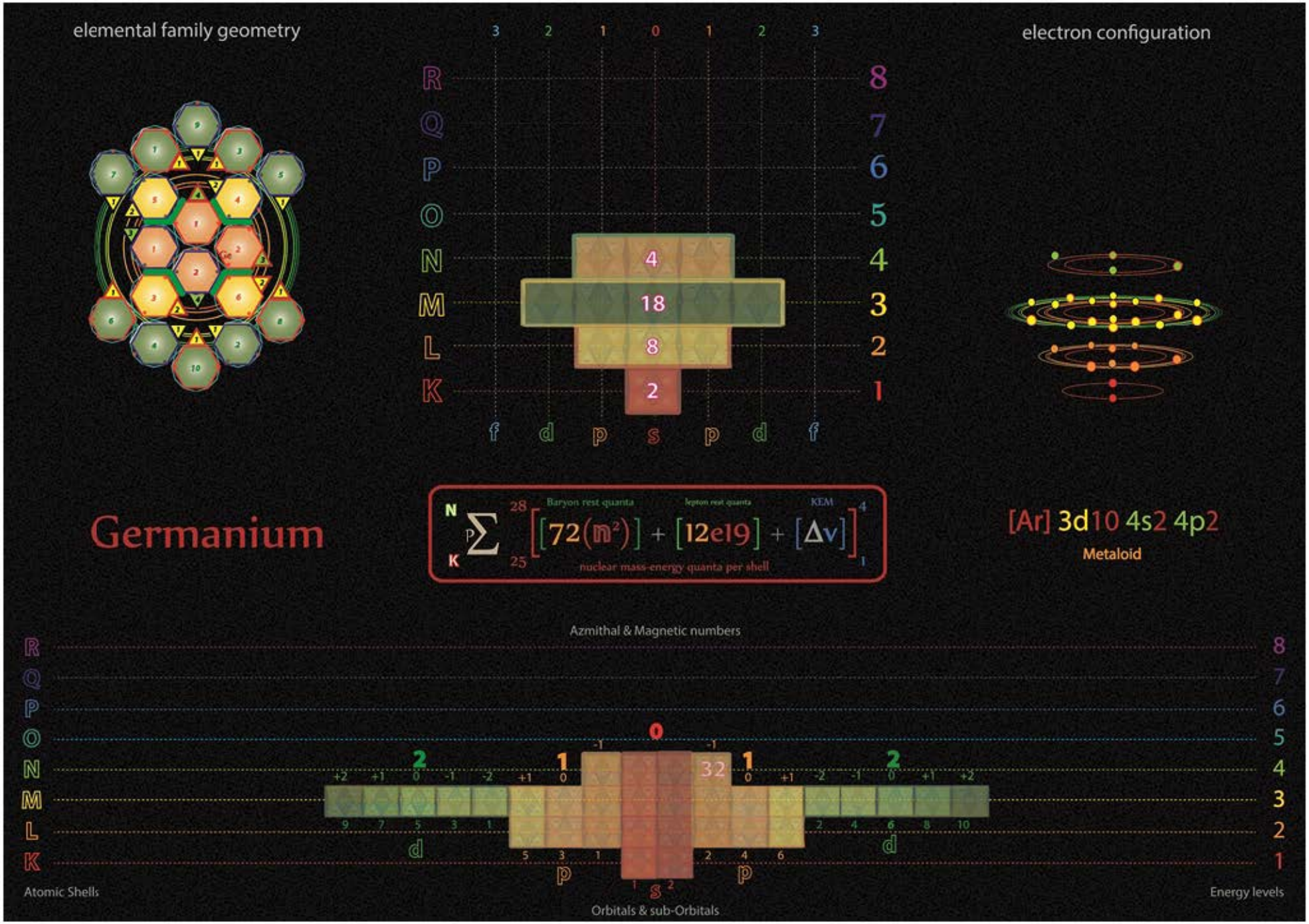

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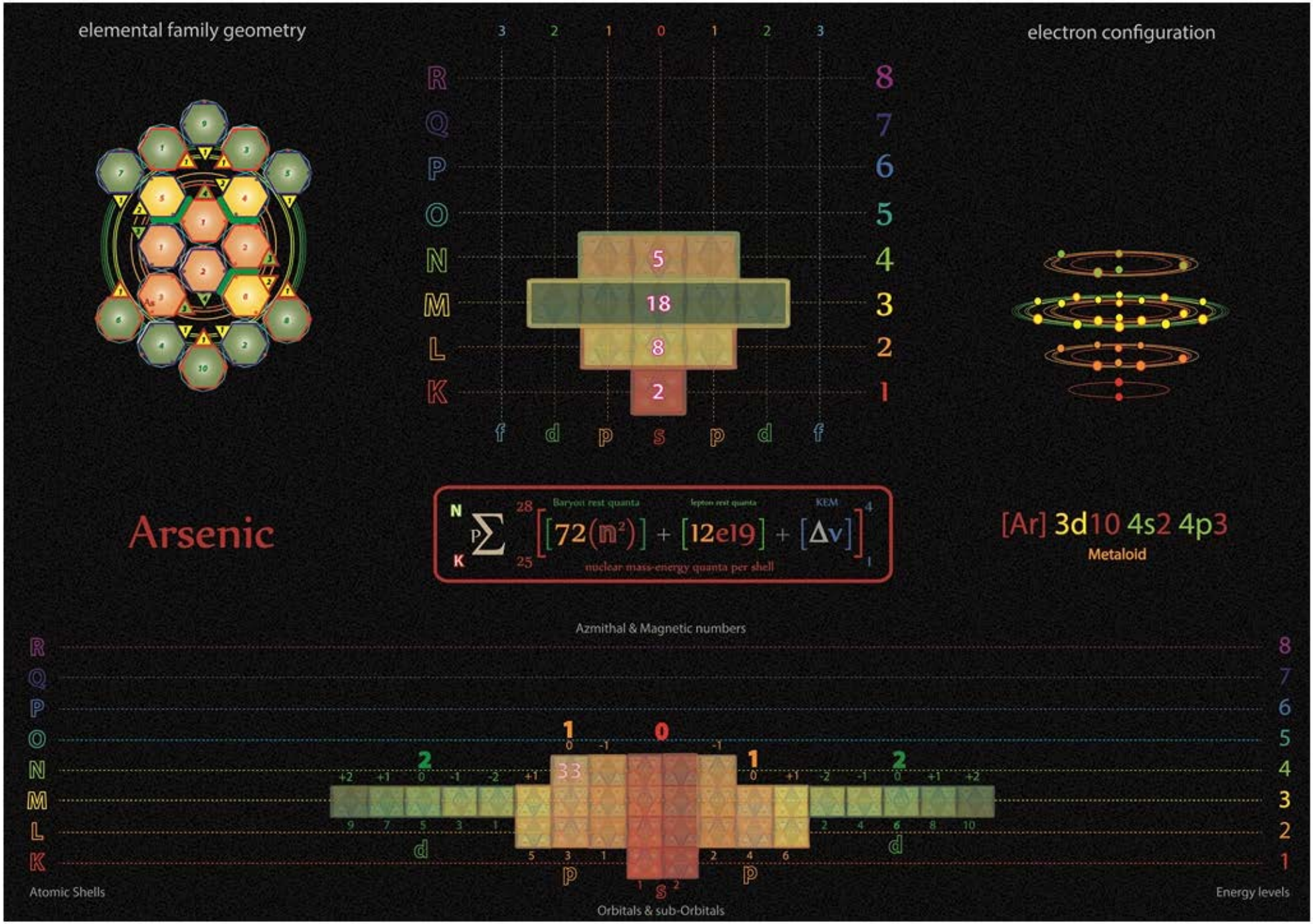

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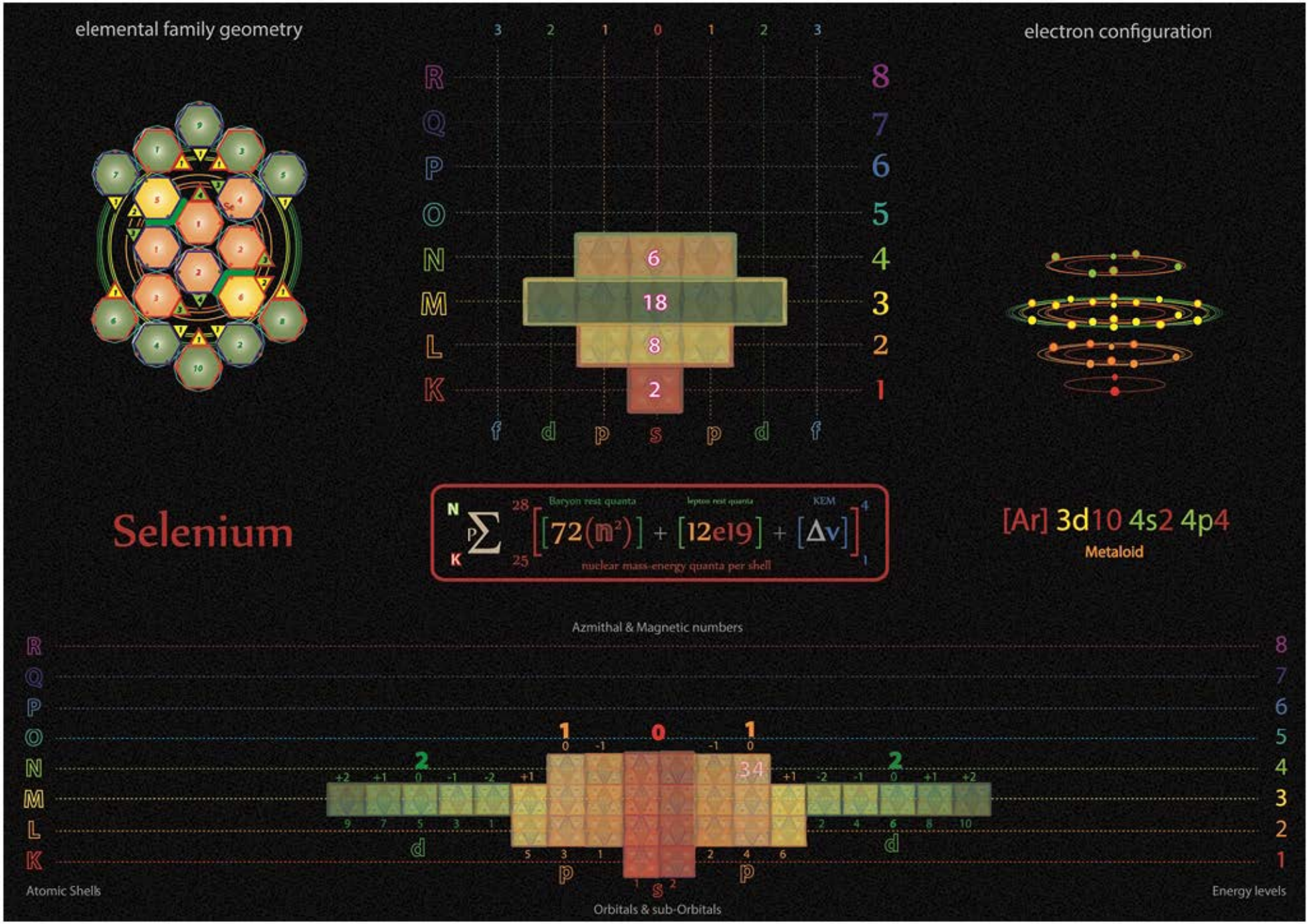

Tetryonics 53.34 - Selenium atomic config

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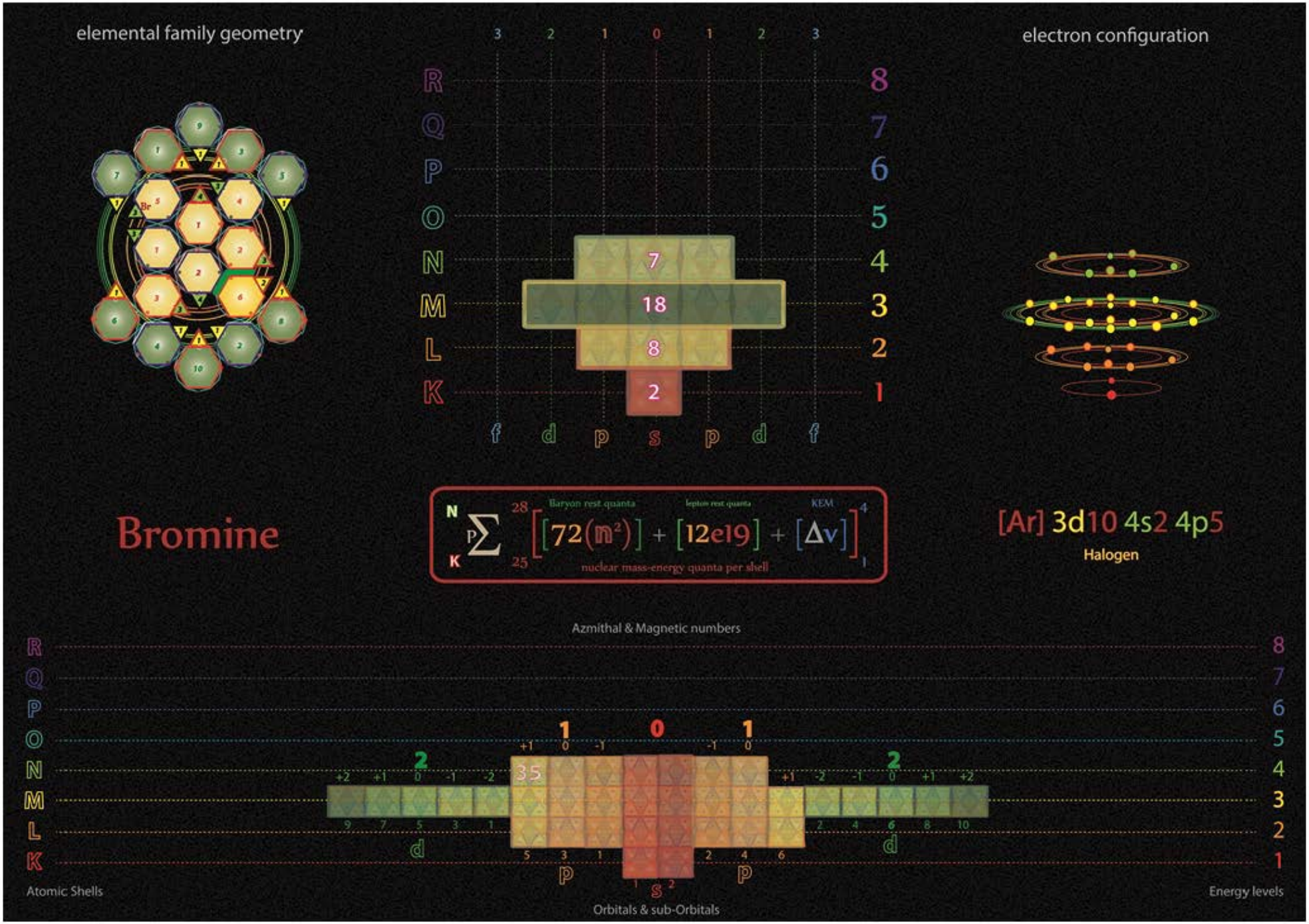

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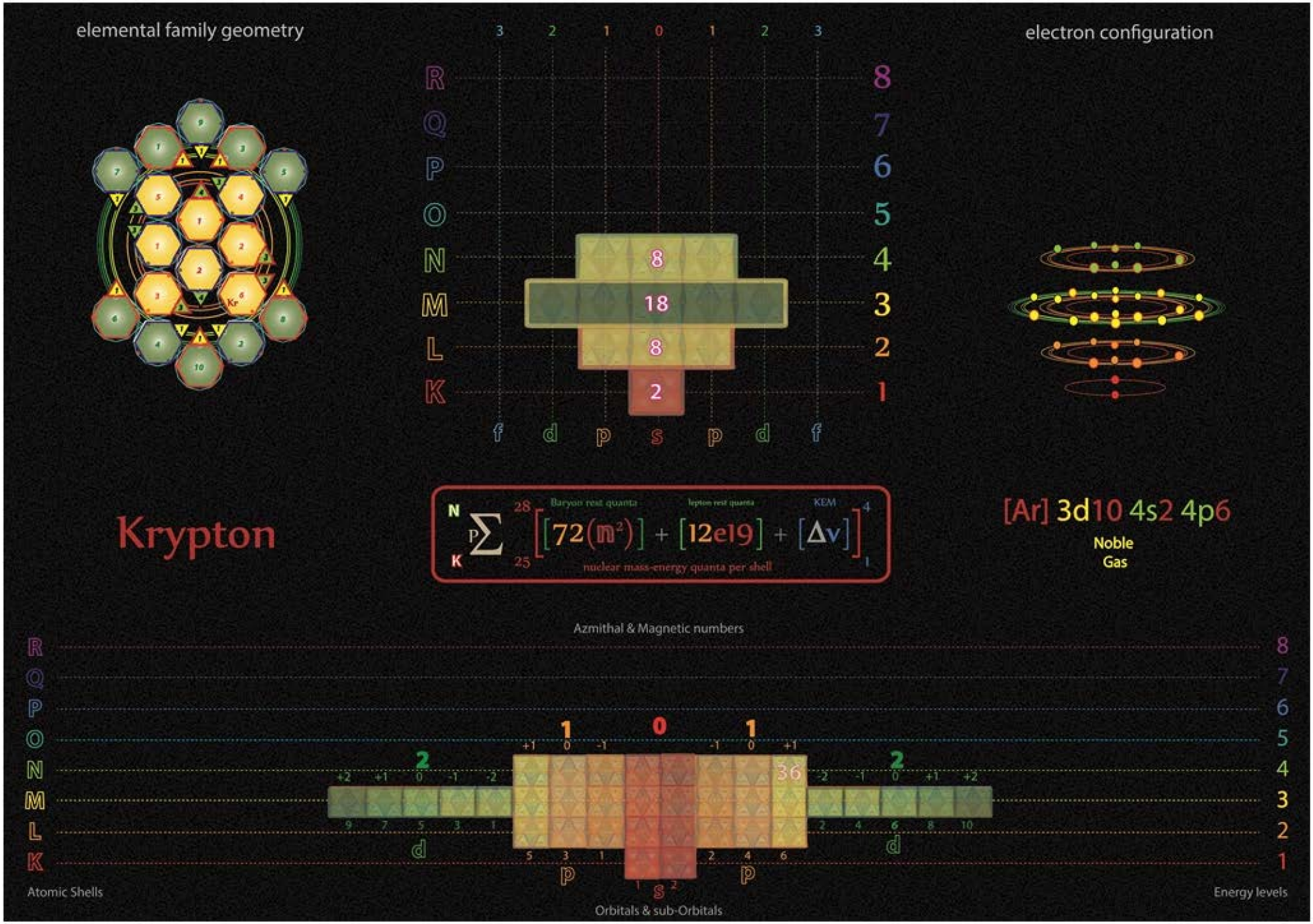

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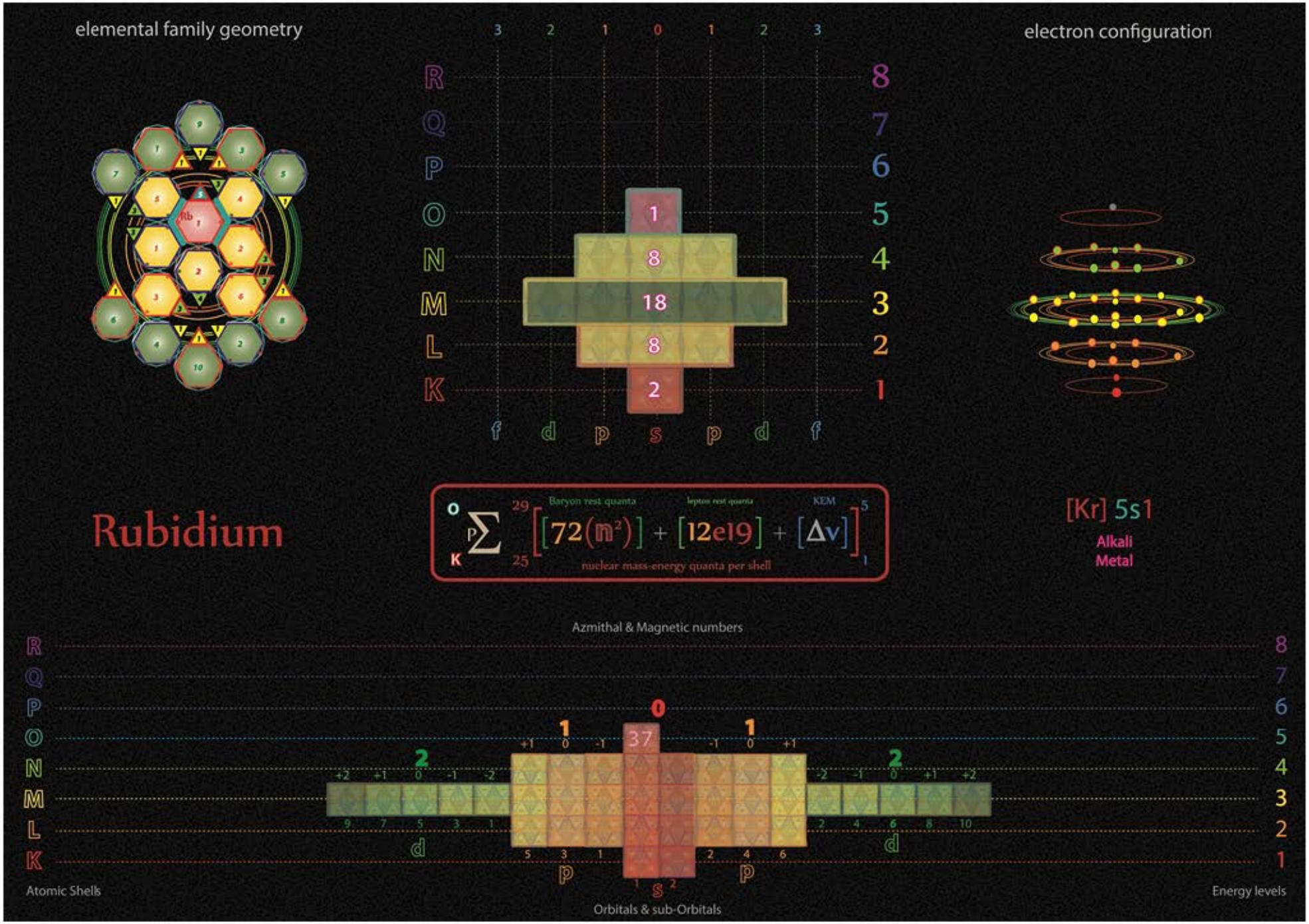

Tetryonics 53.37 - Rubidium atomic config

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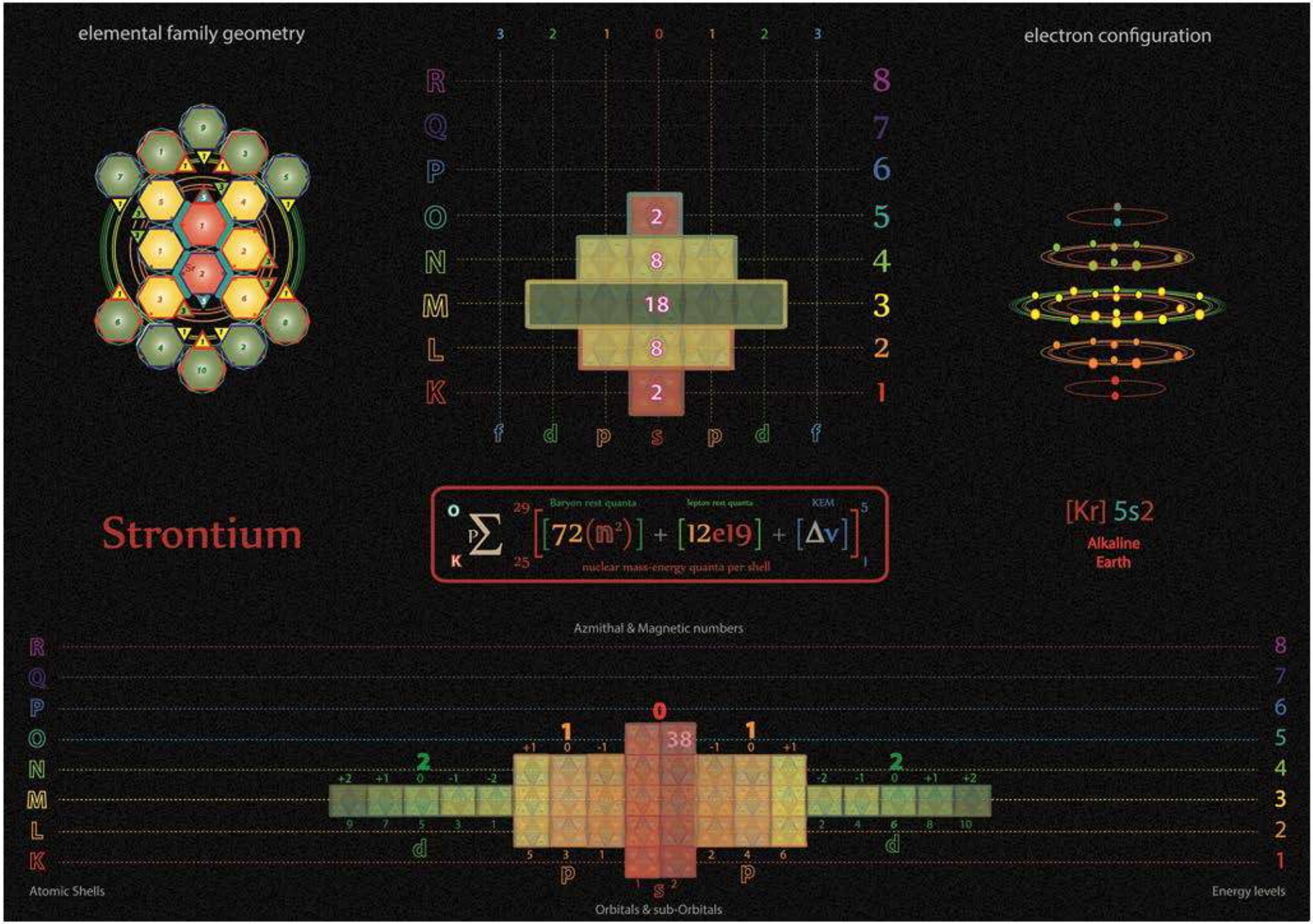

Tetryonics 53.38 - Strontium atomic config

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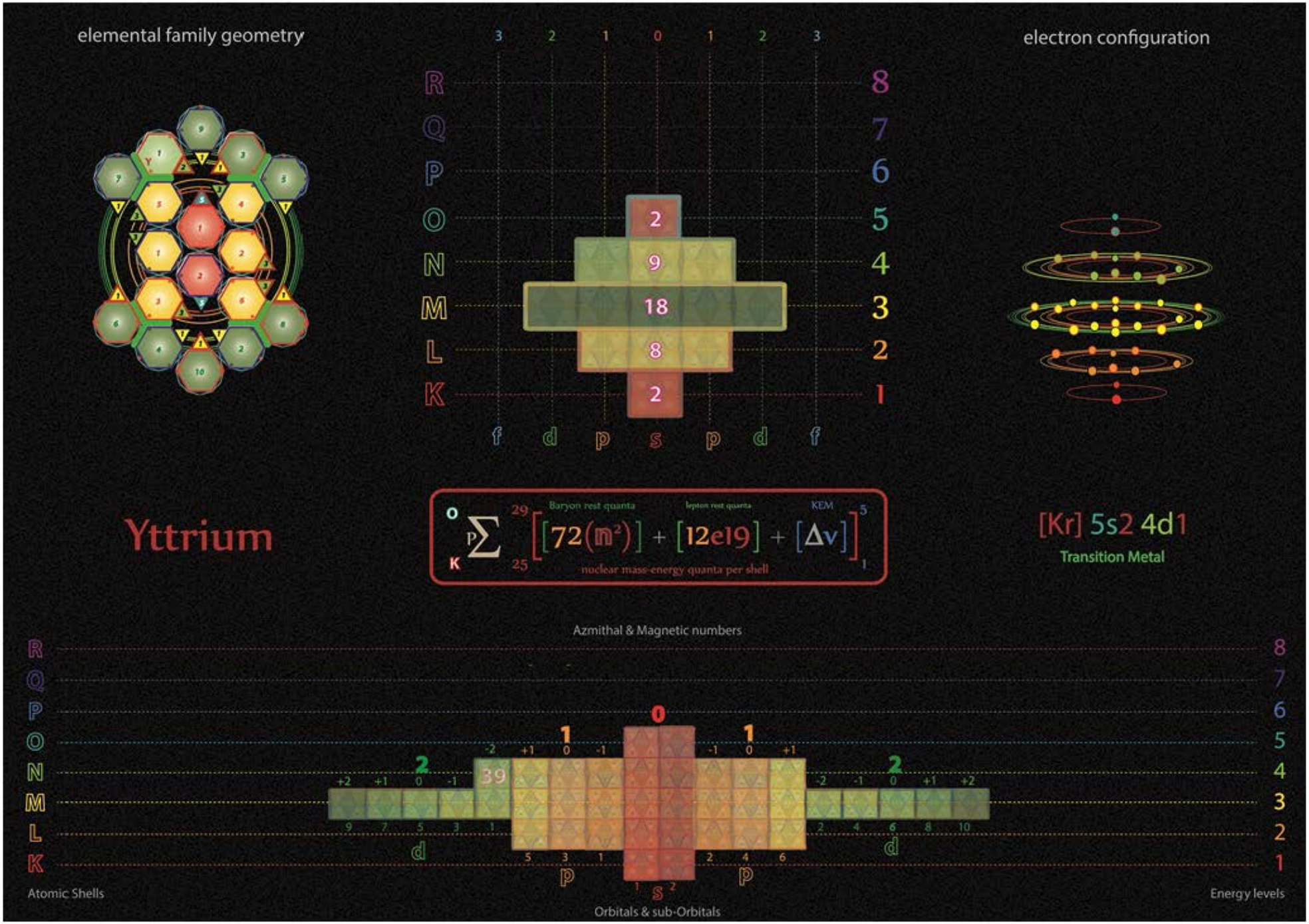

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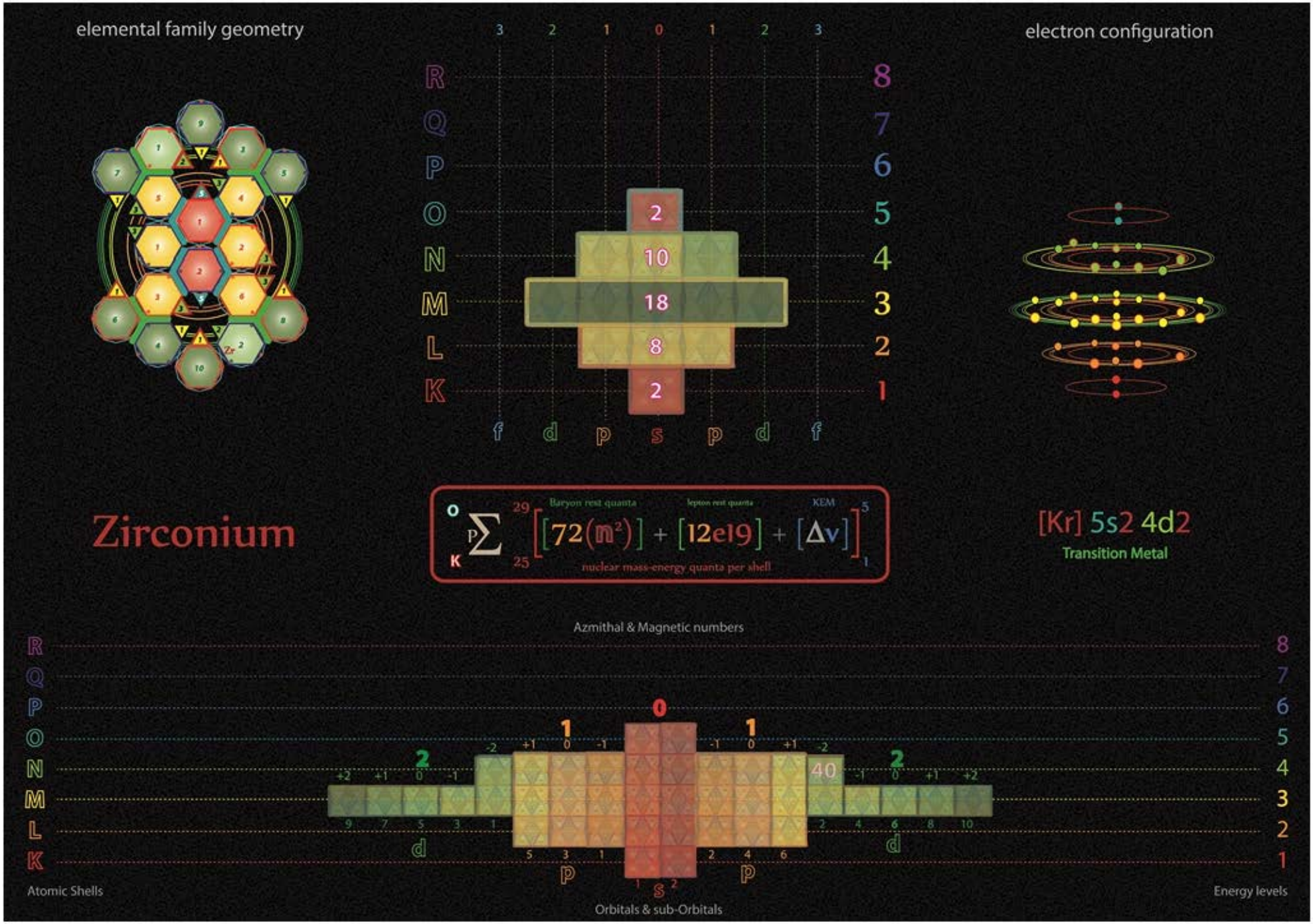

Tetryonics 53.40 - Zirconium atomic config

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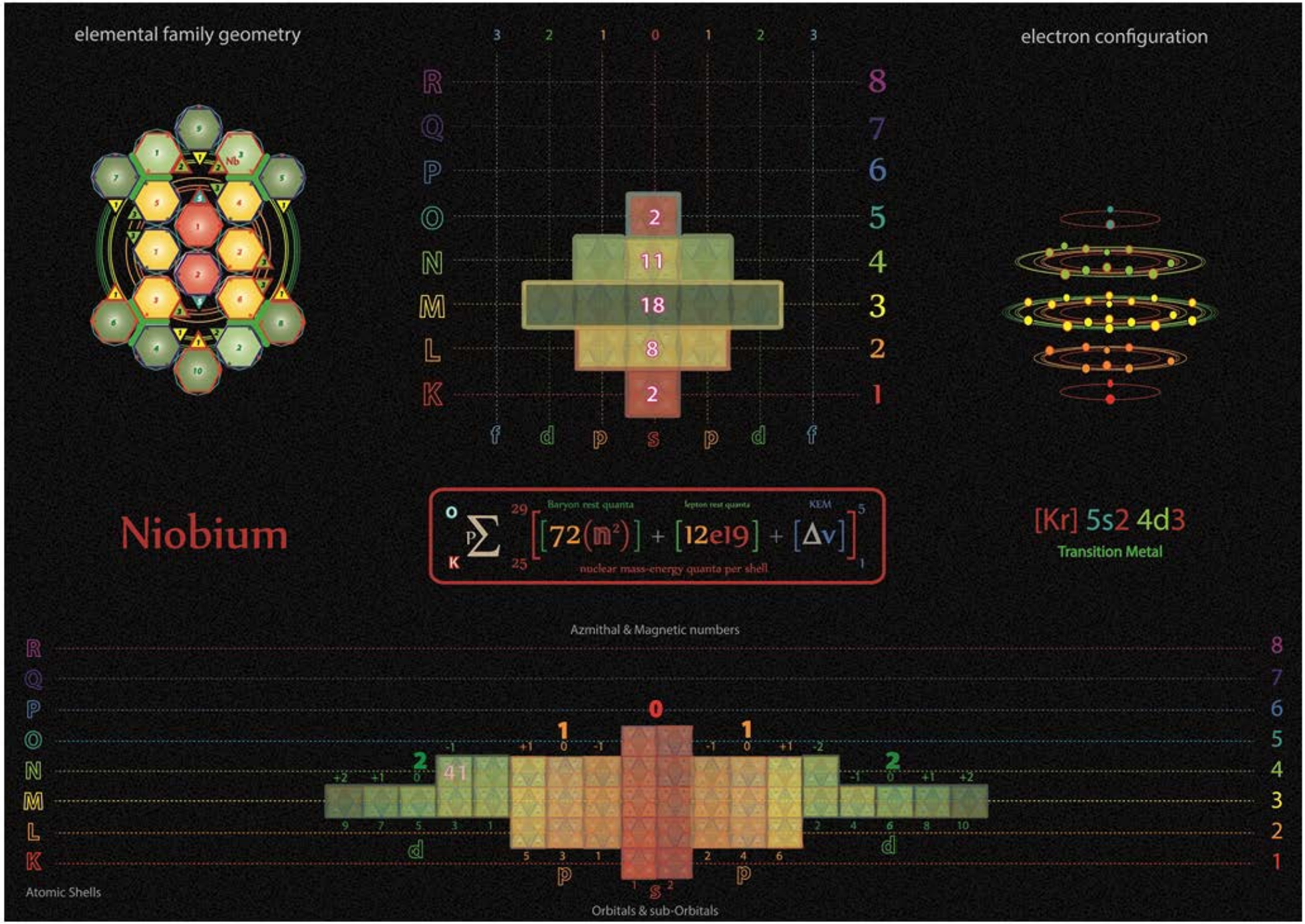

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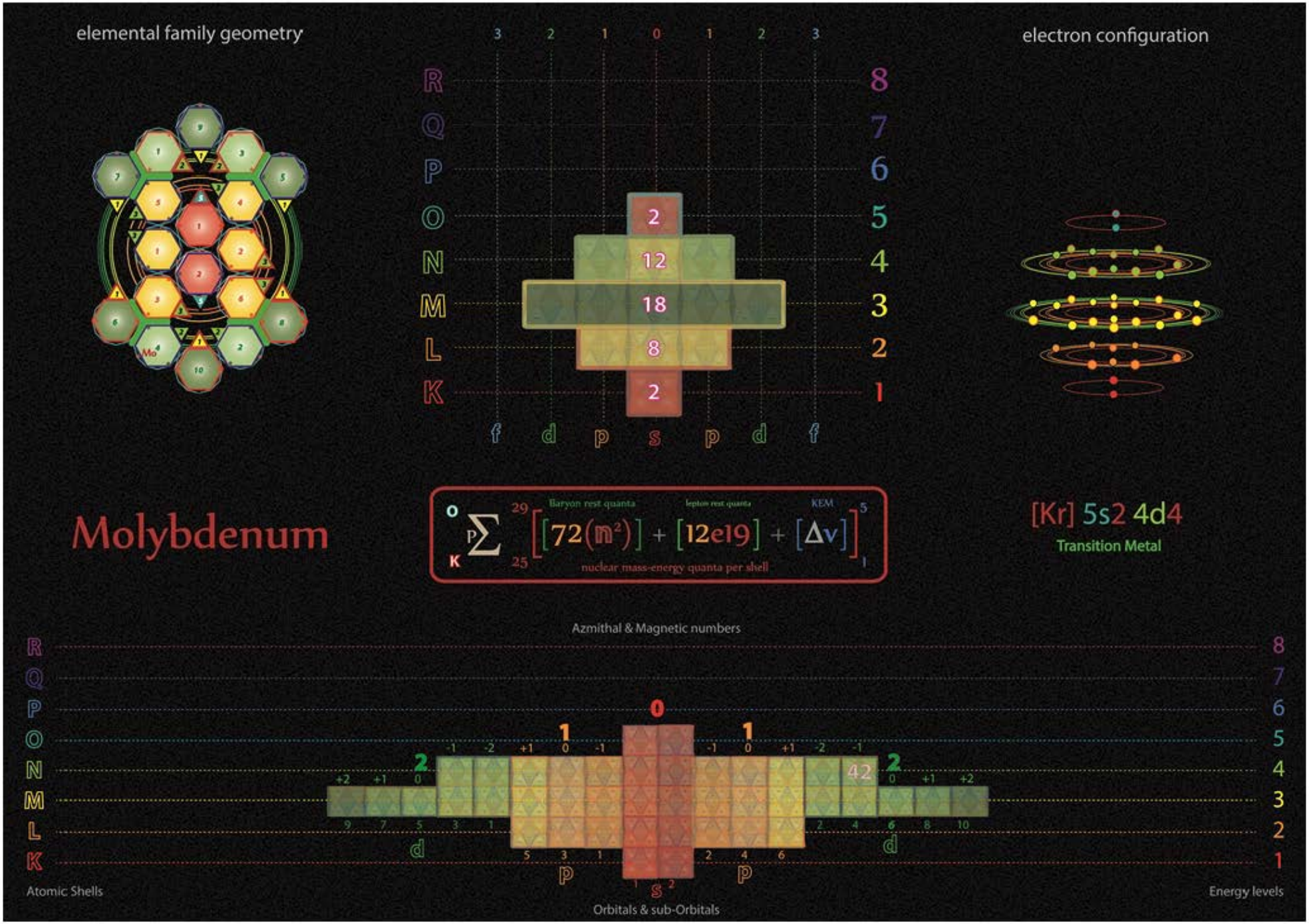

Tetryonics 53.42 - Molybdenum atomic config

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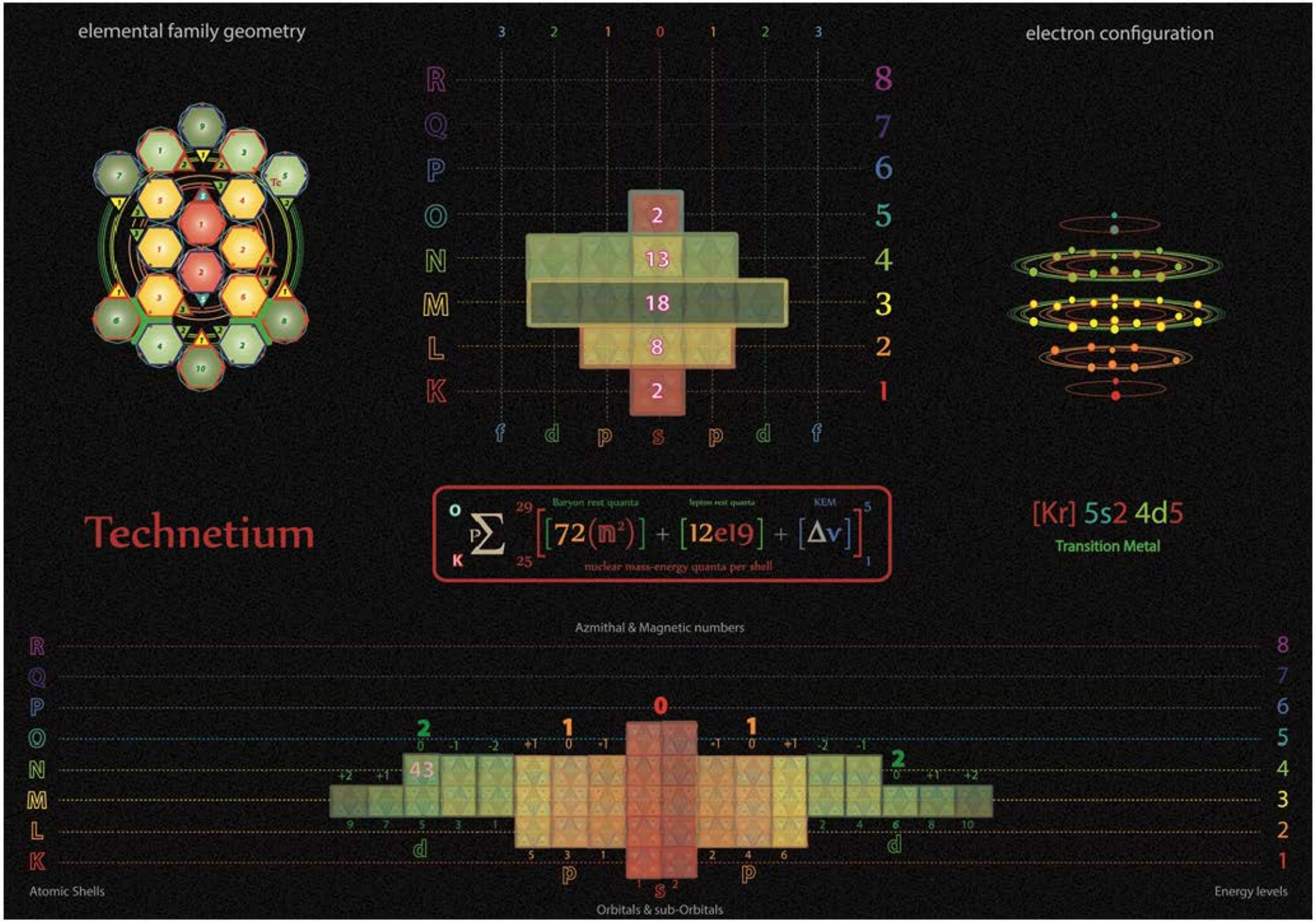

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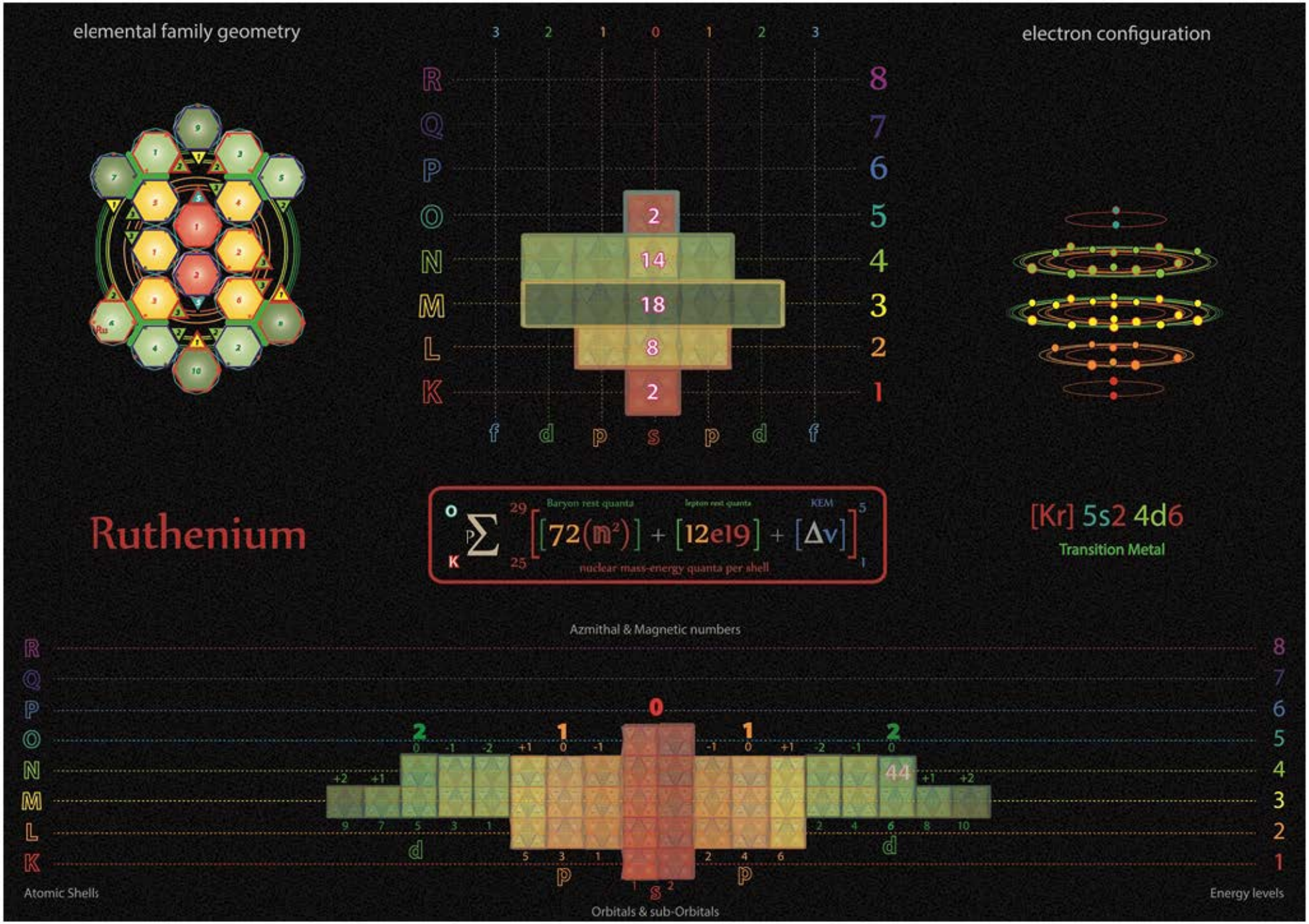

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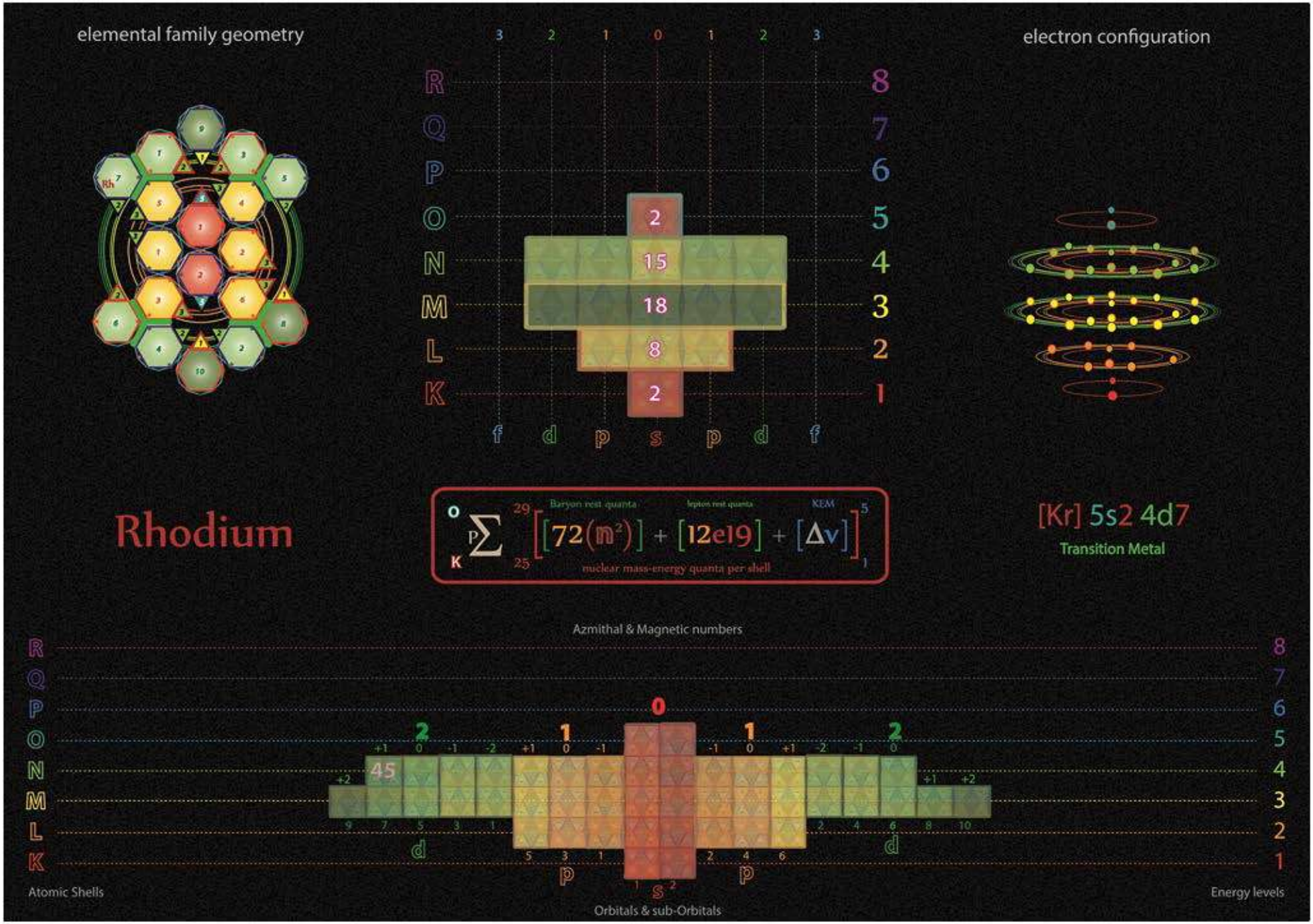

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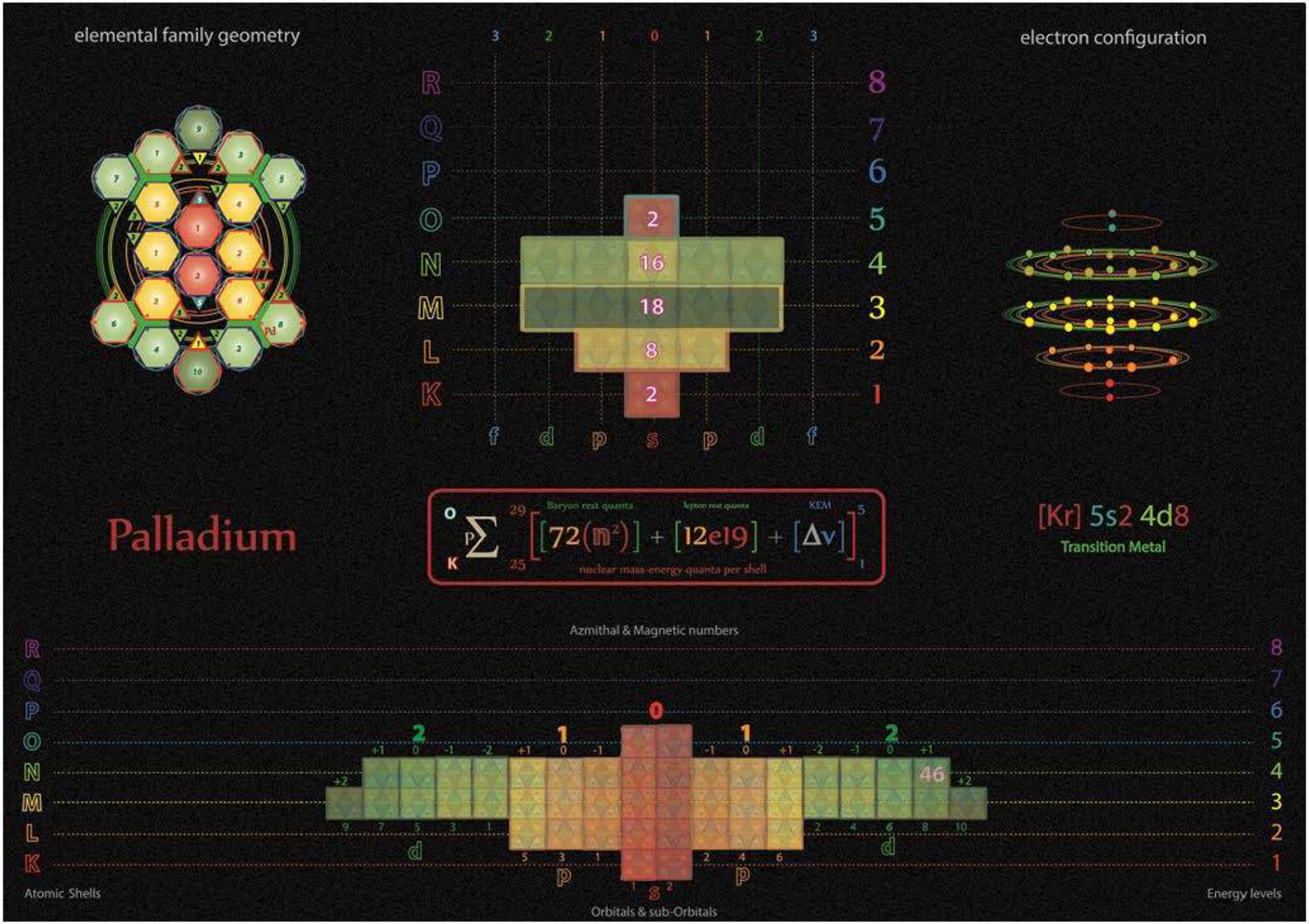

Tetryonics 53.46 - Palladium atomic config

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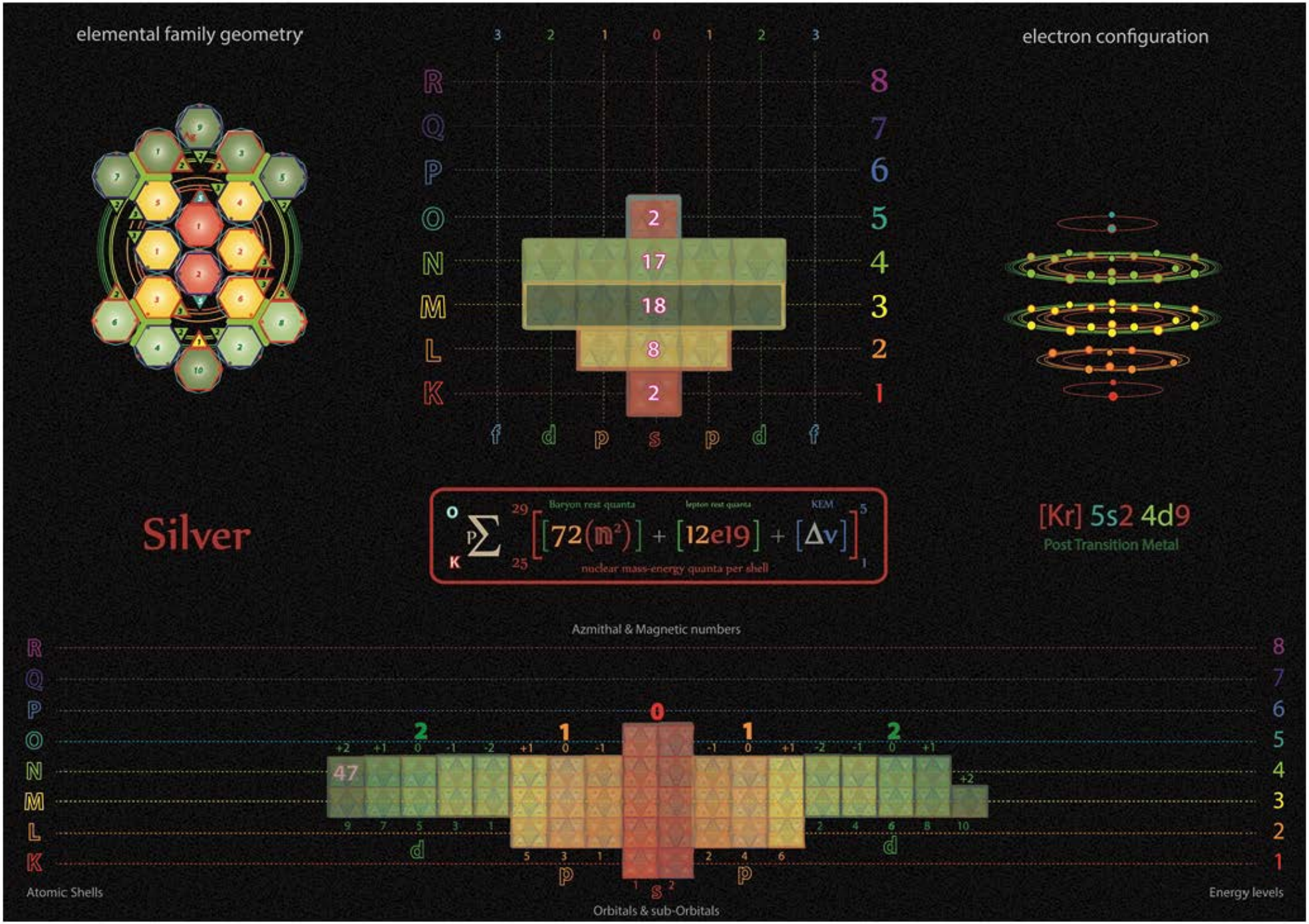

Tetryonics 53.47 - Silver atomic config

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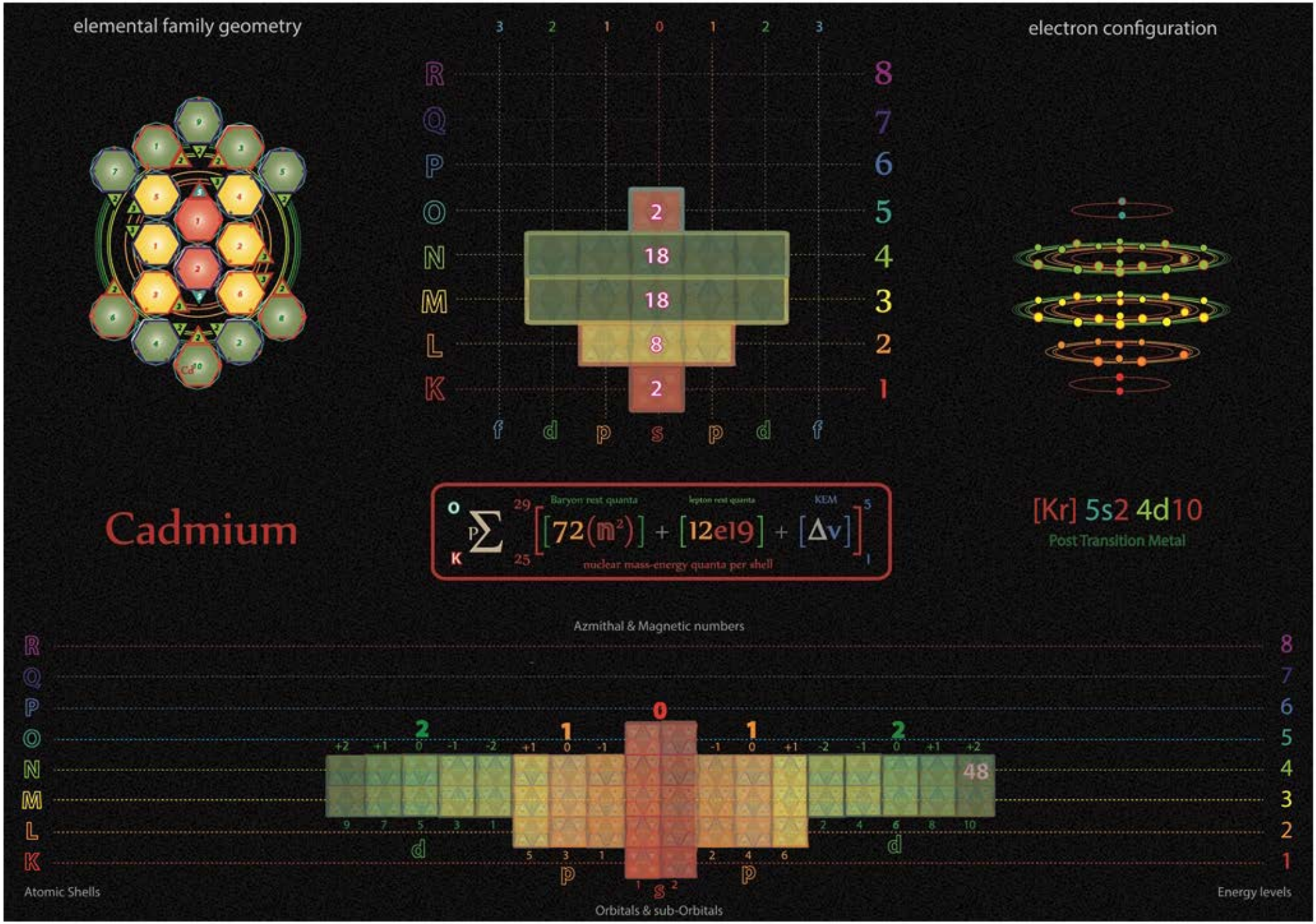

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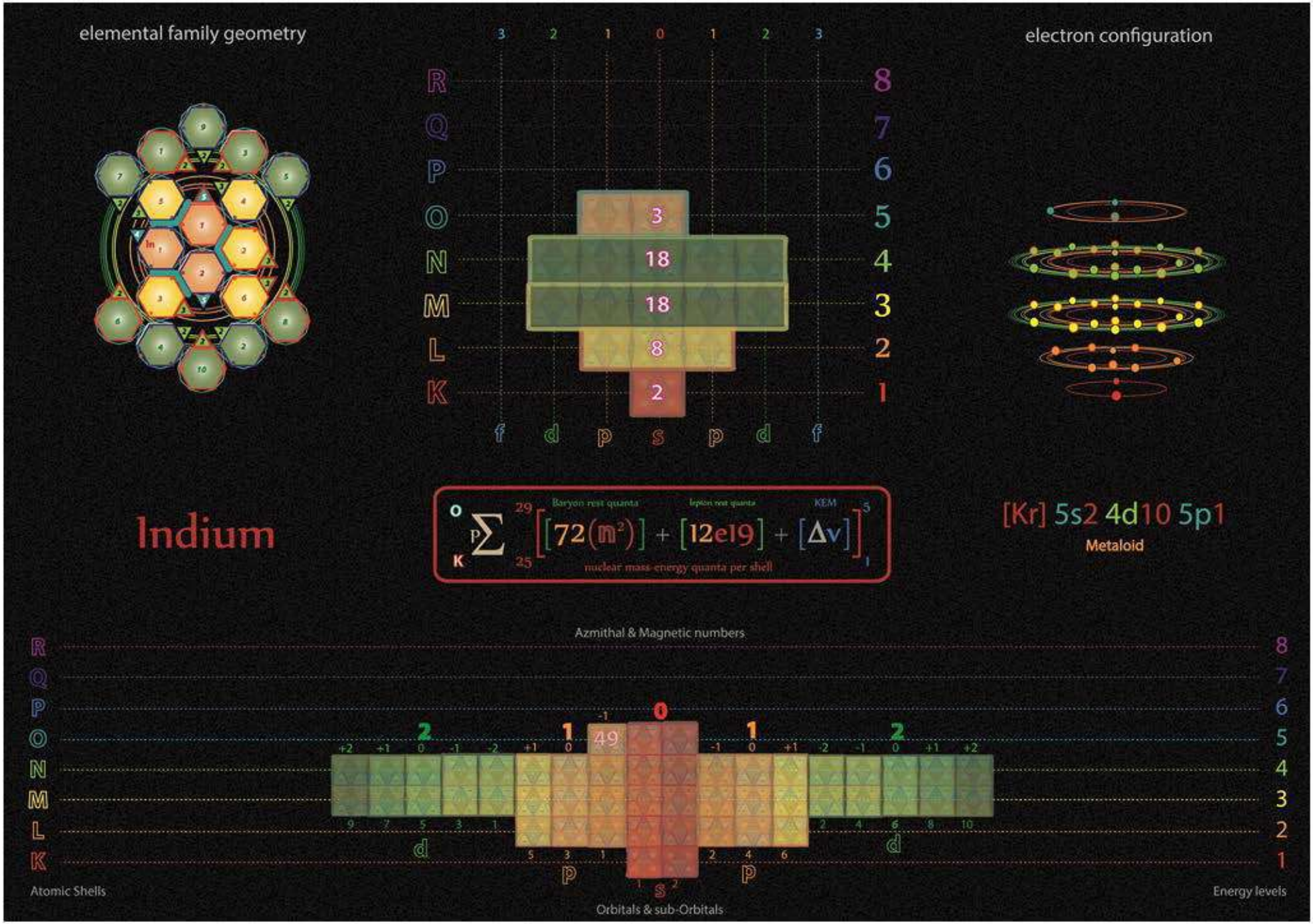

Tetryonics 53.49 - Indium atomic config

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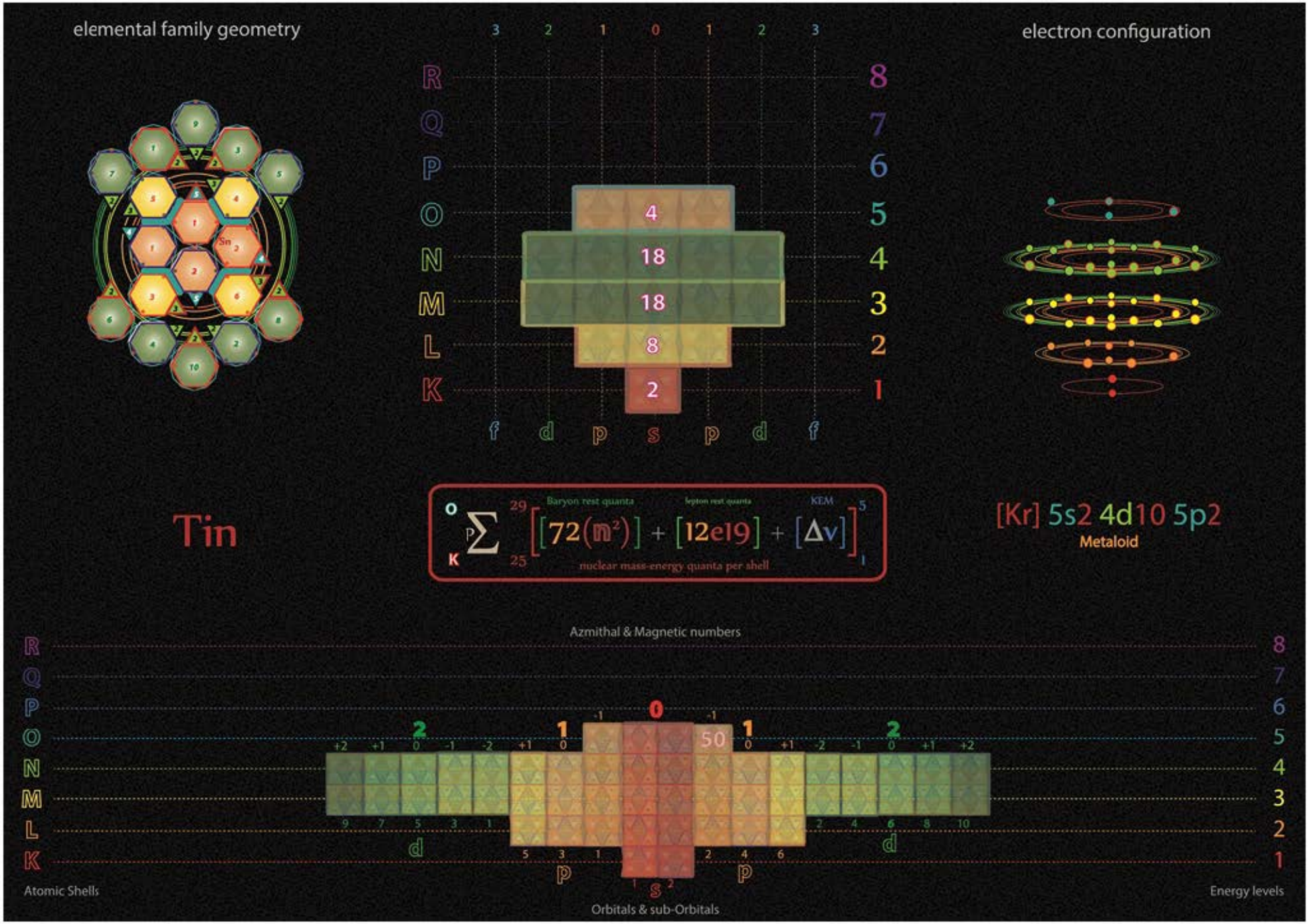

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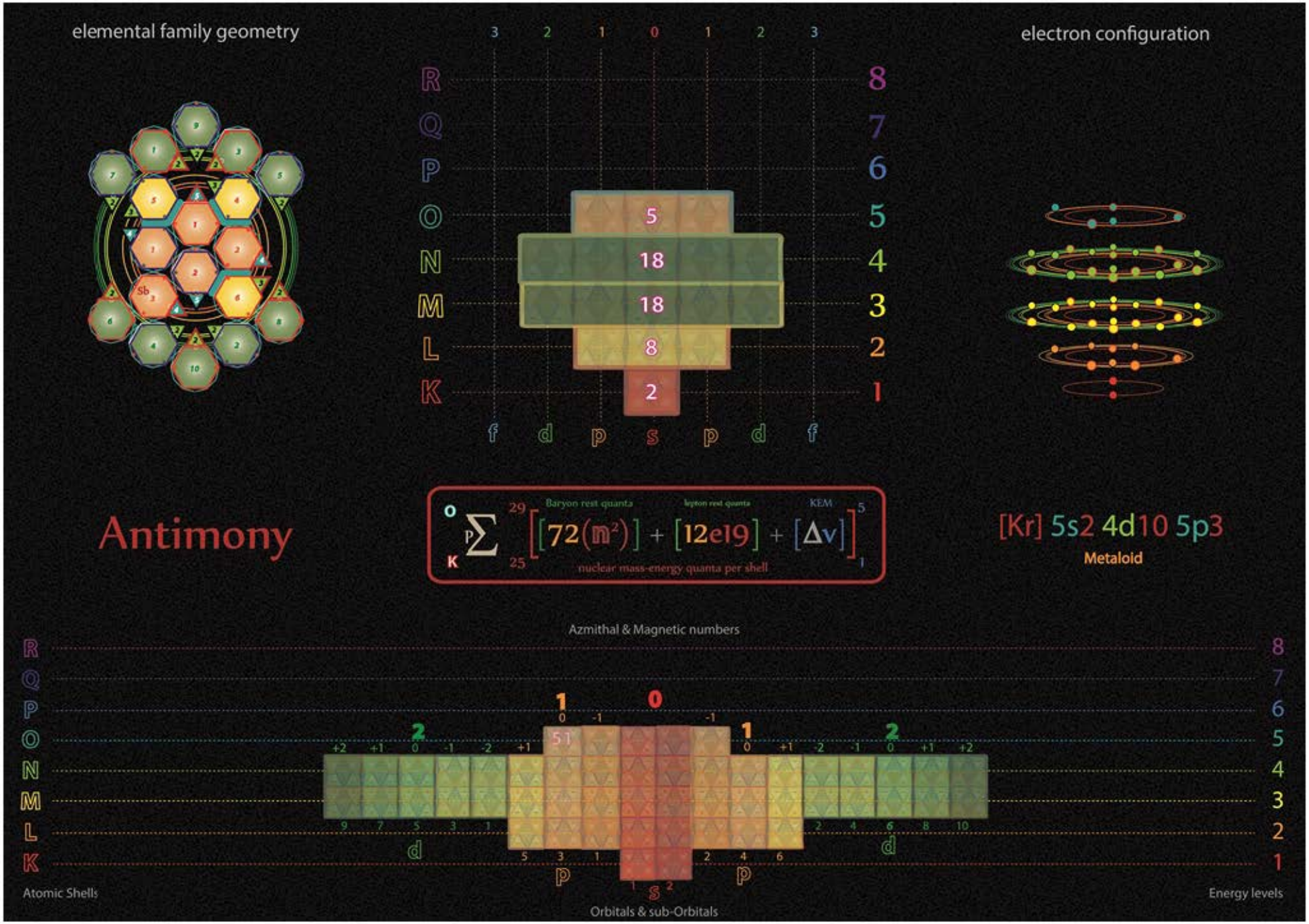

Tetryonics 53.51 - Antimony atomic config

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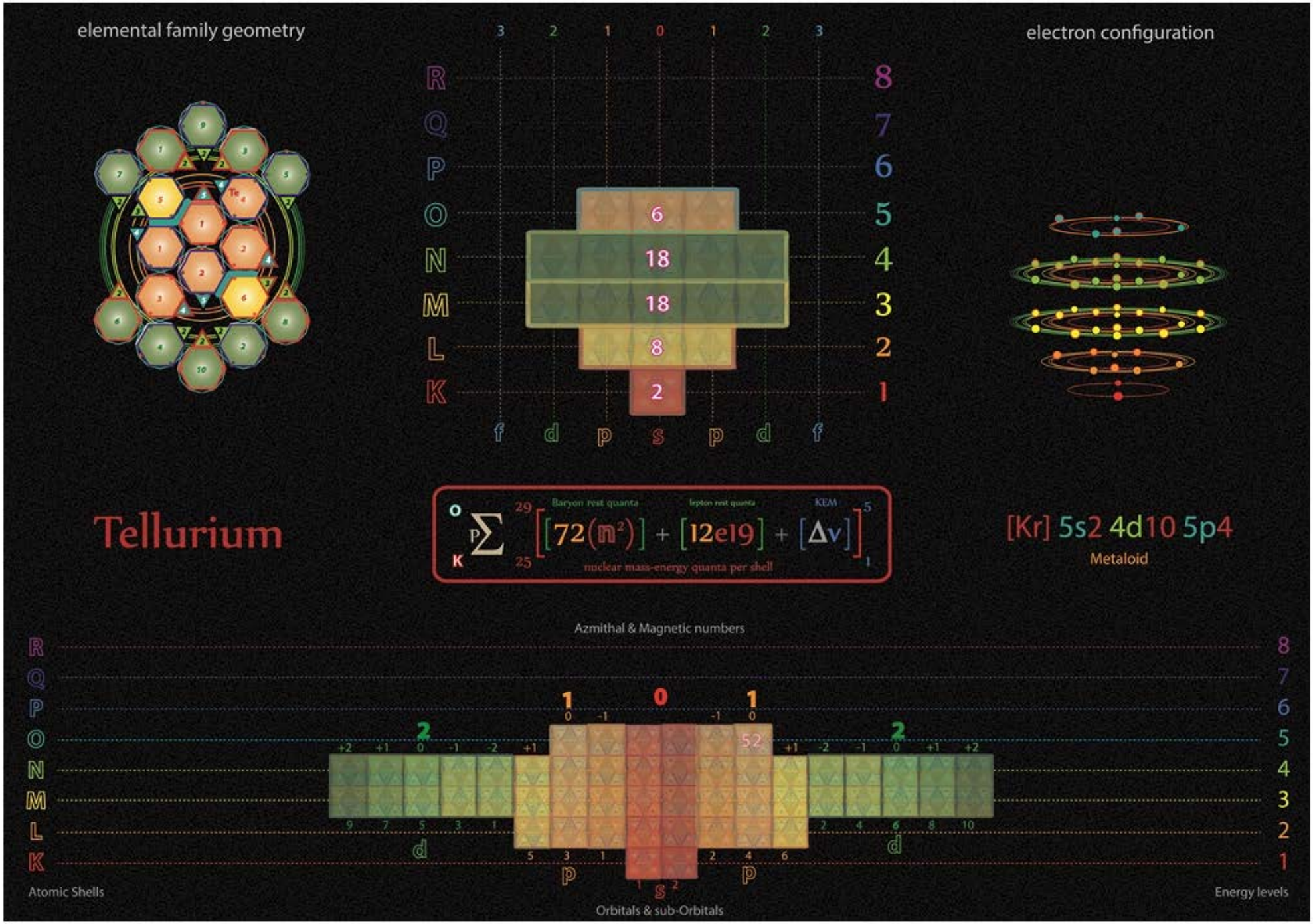

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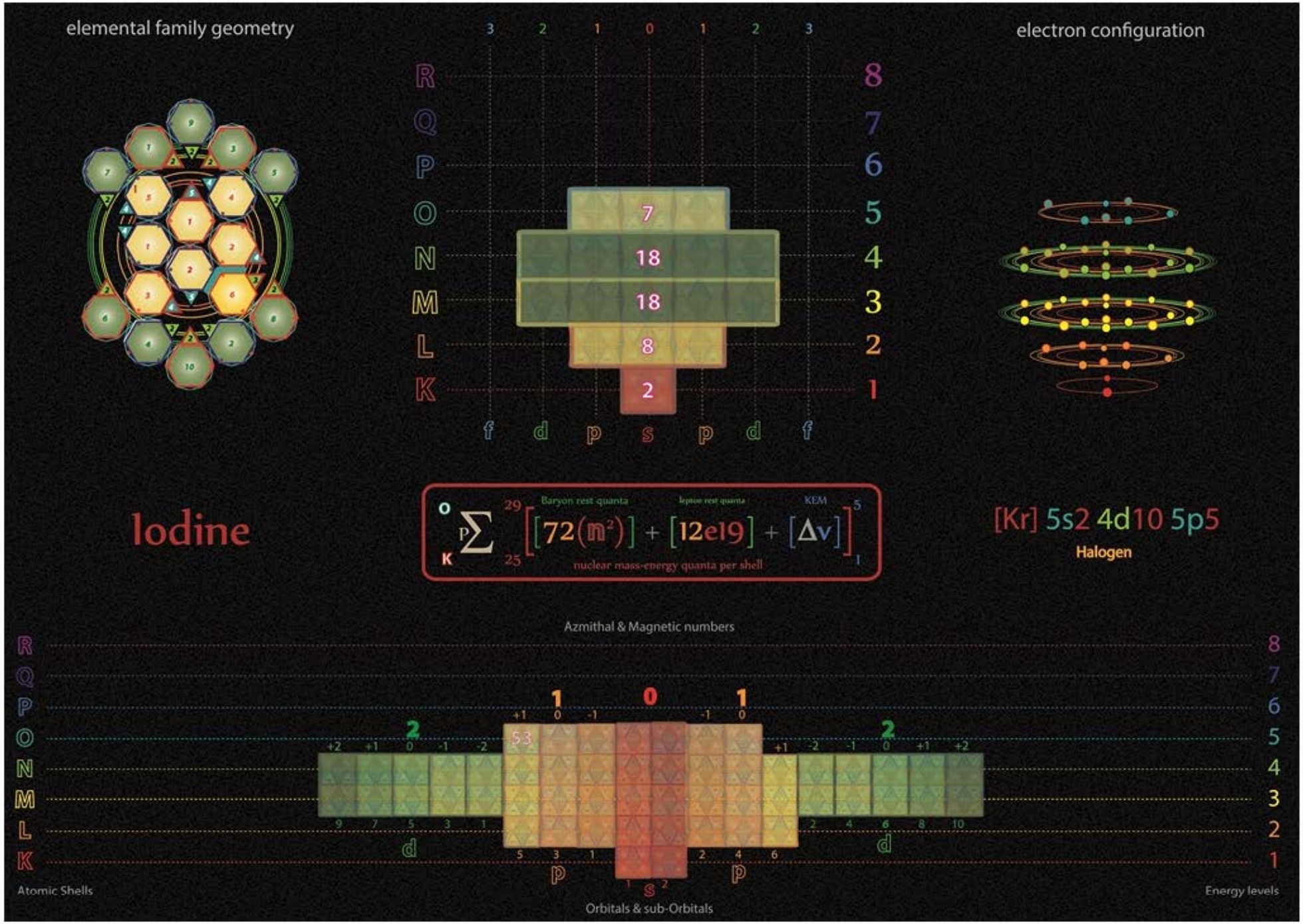

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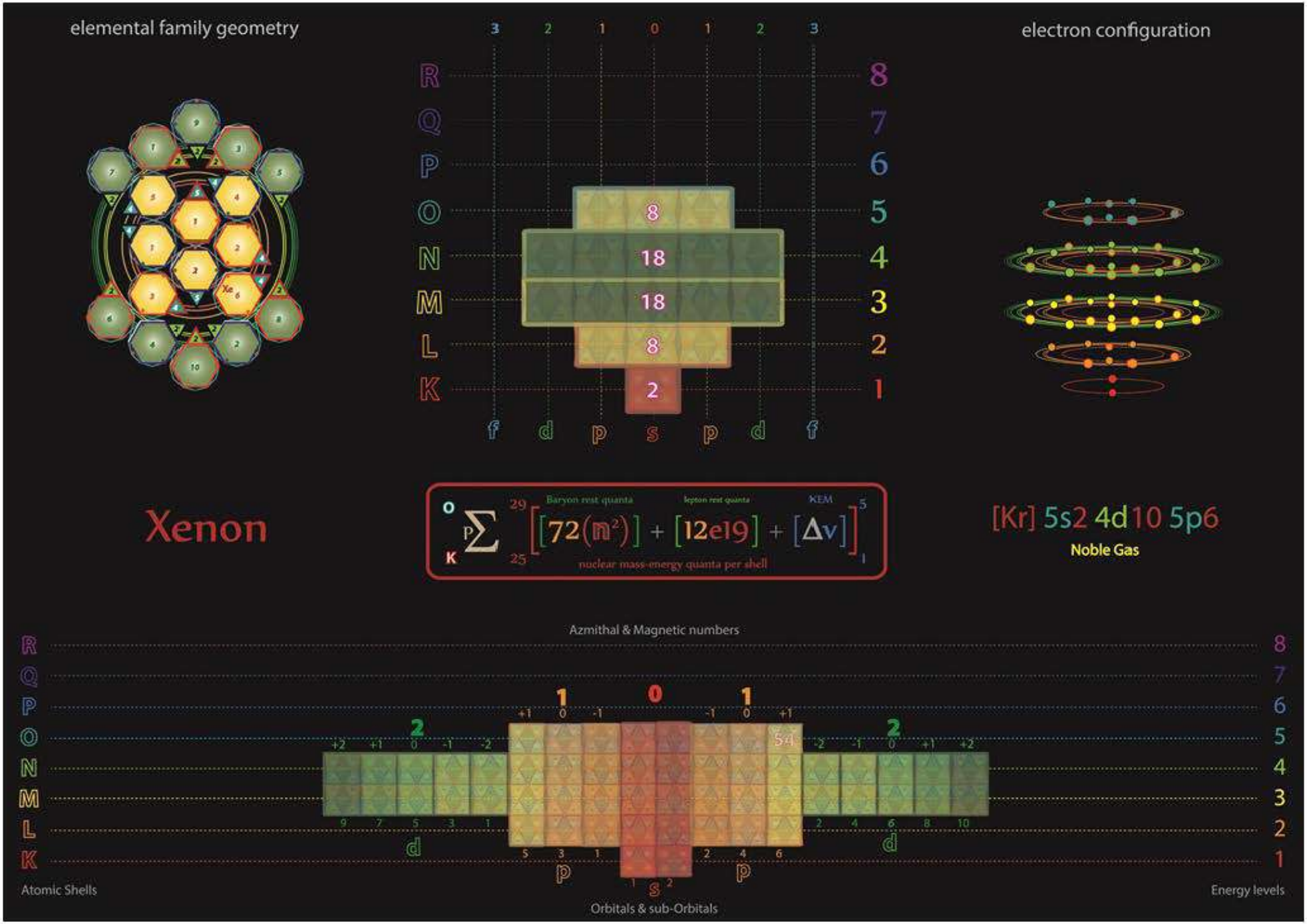

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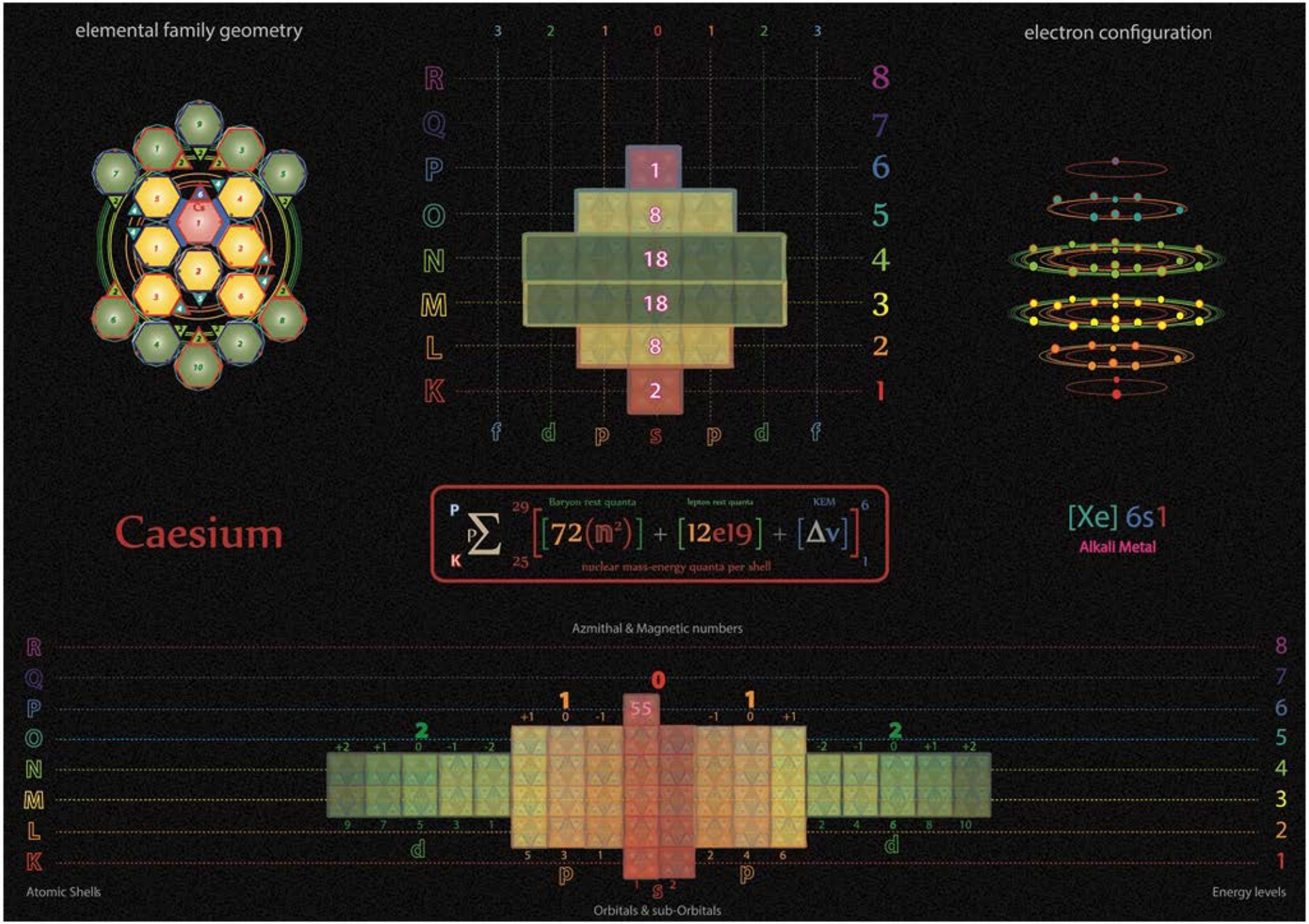

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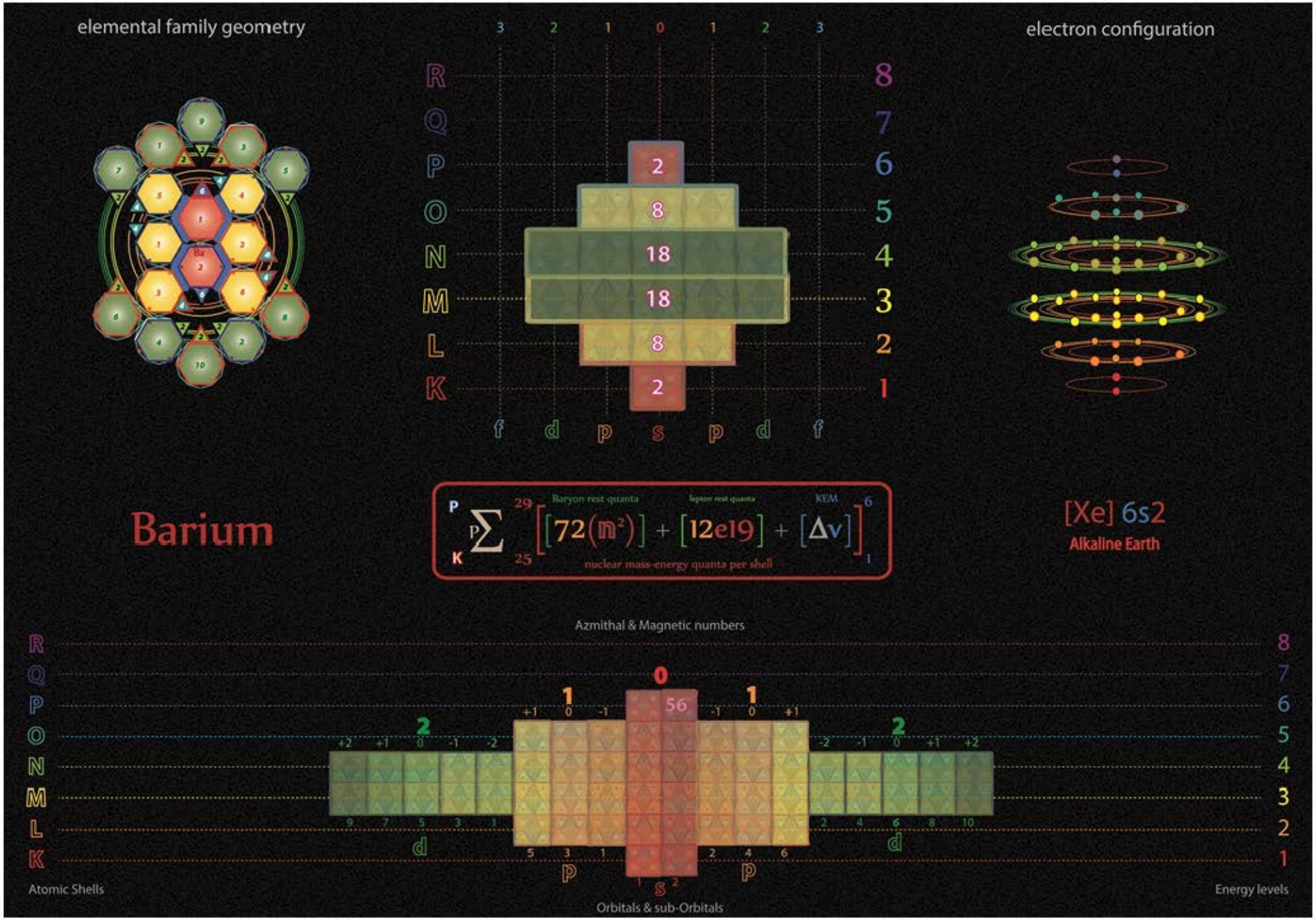

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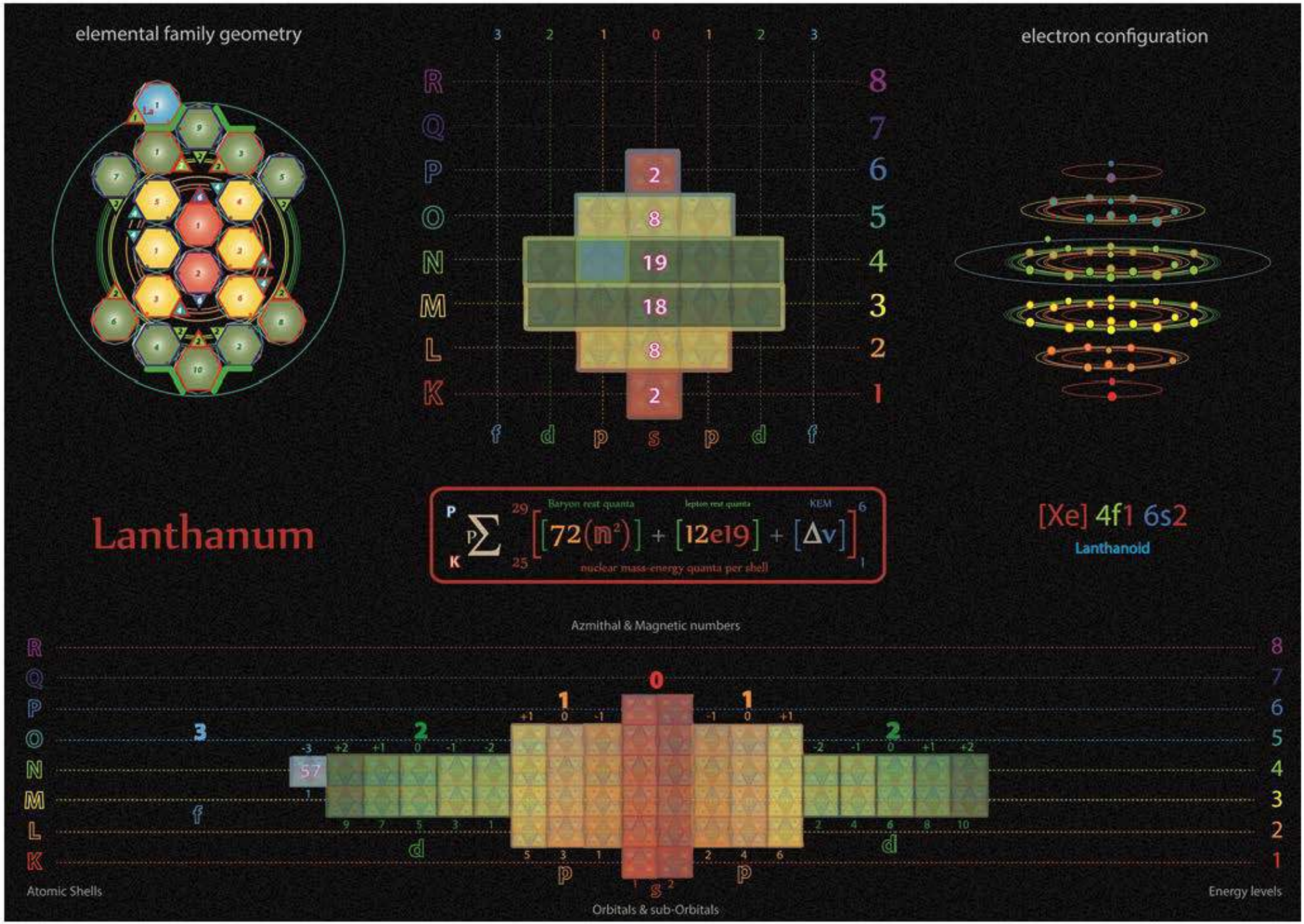

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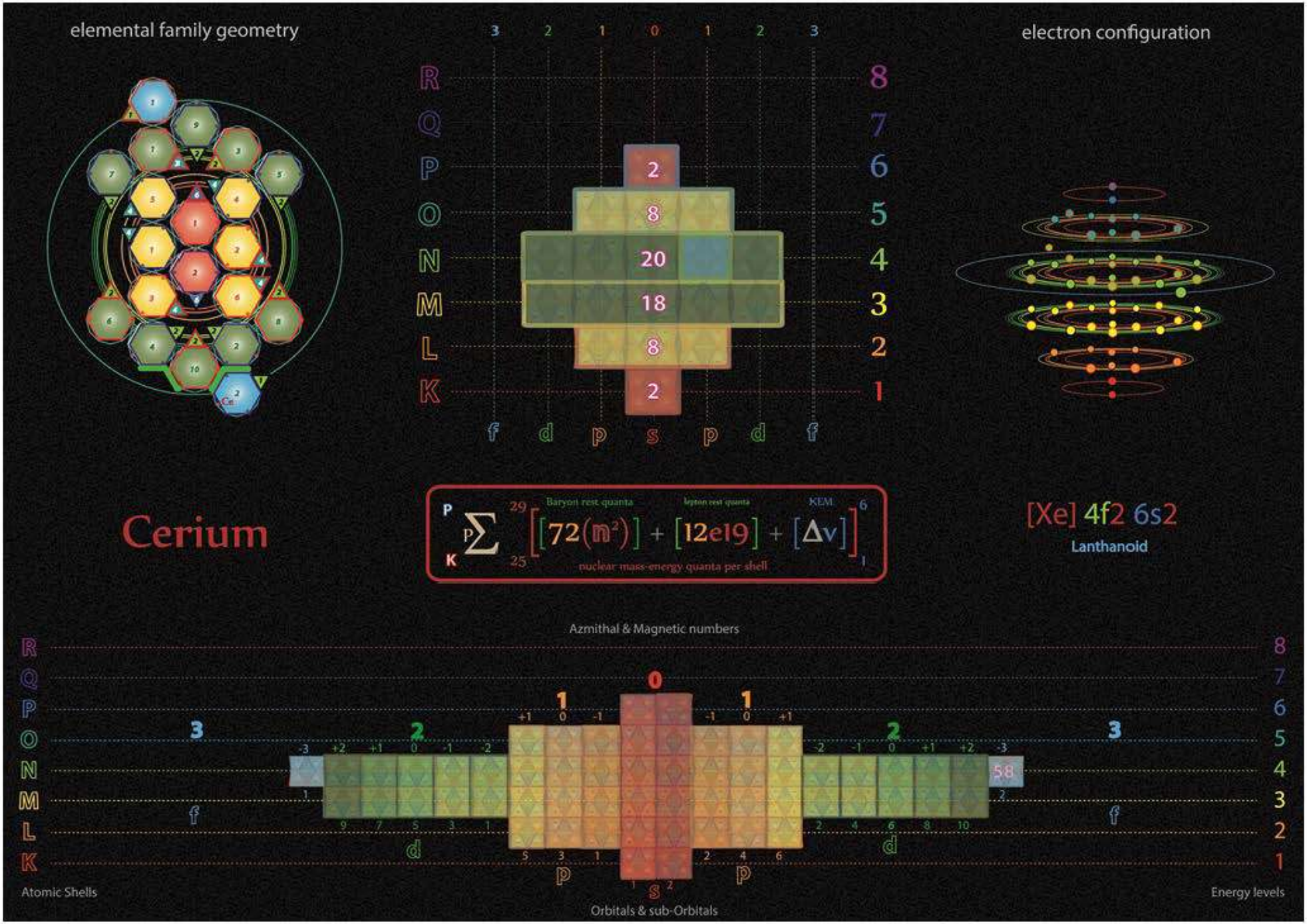

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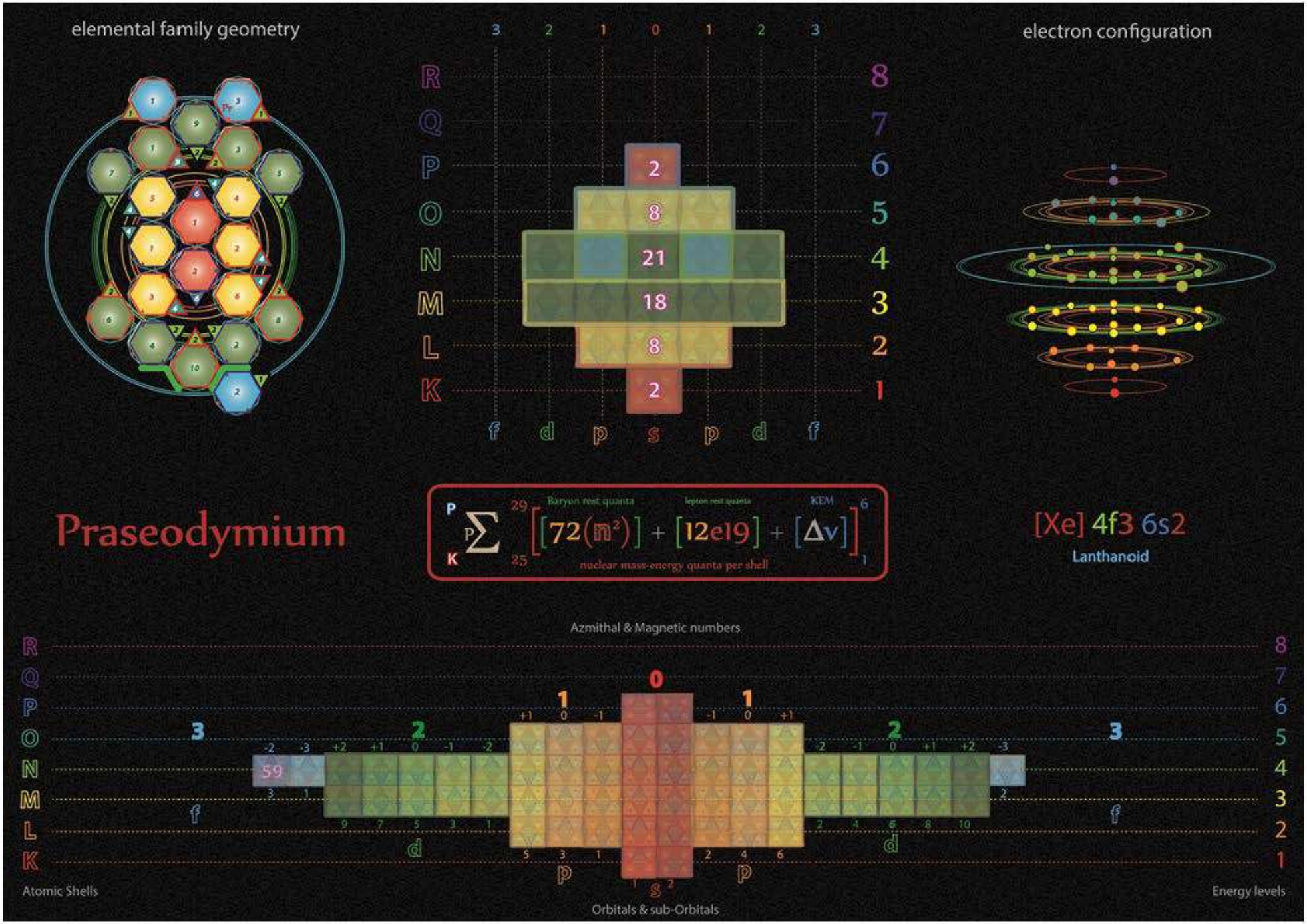

Tetryonics 53.59 - Praseodymium atomic config

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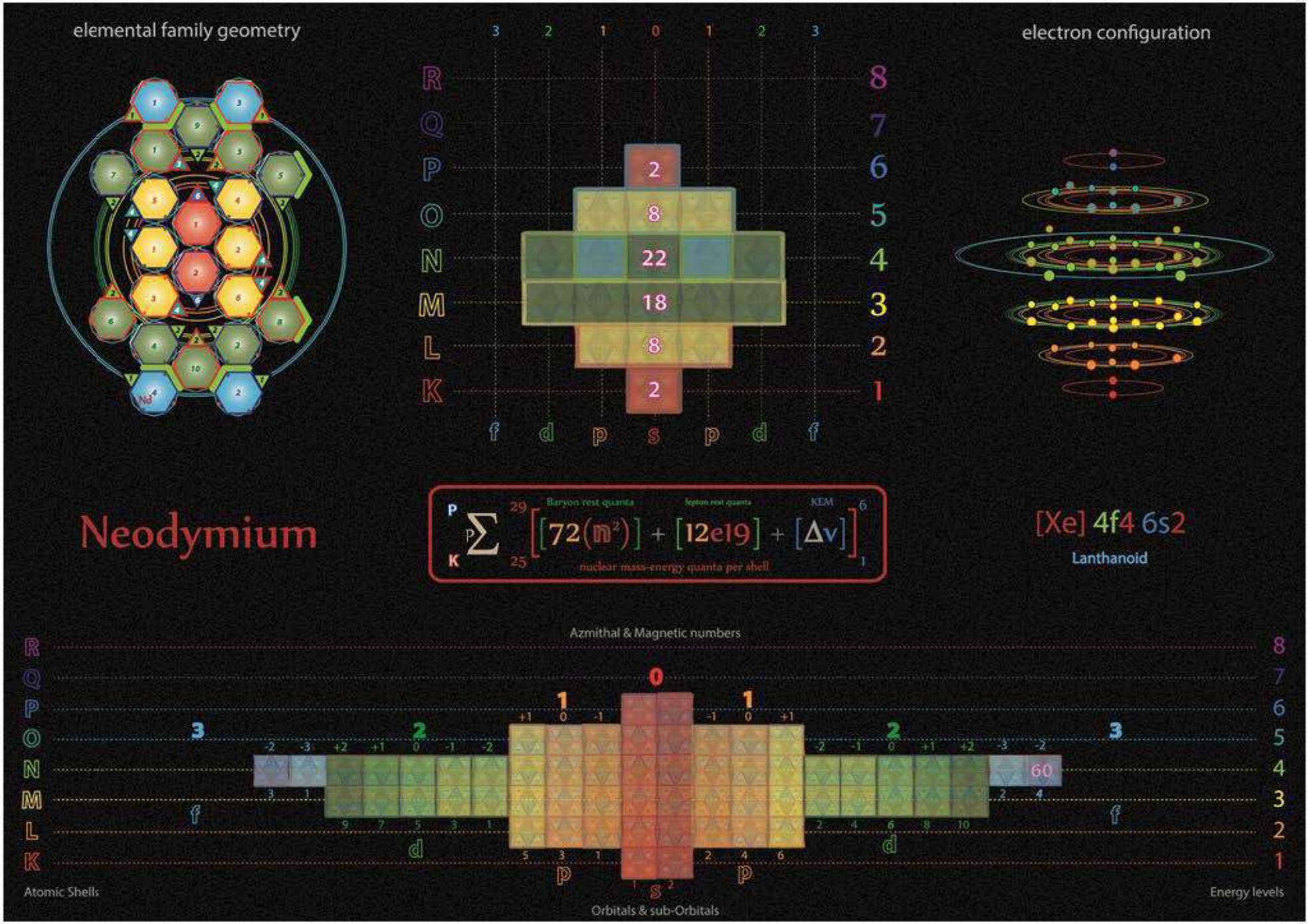

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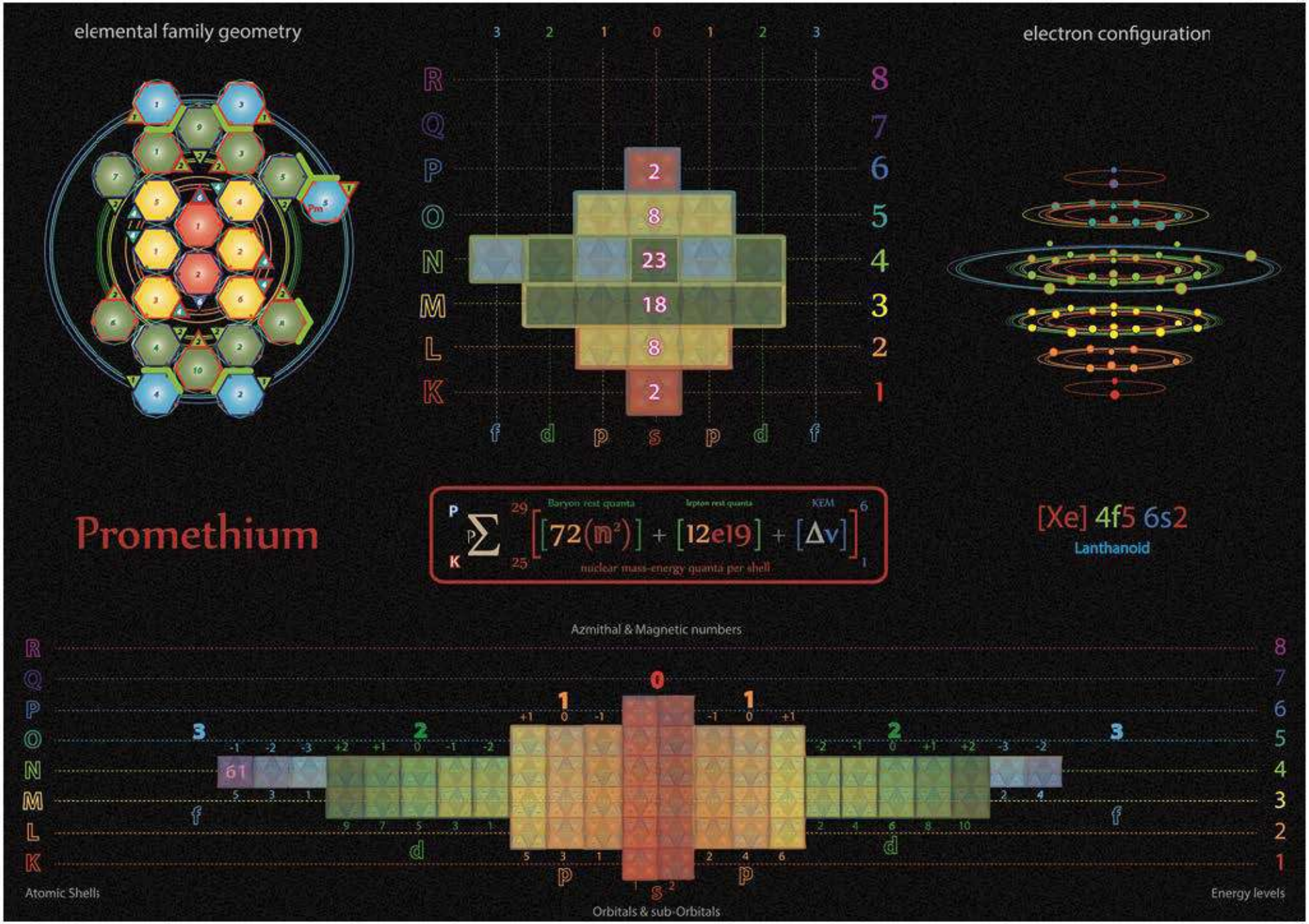

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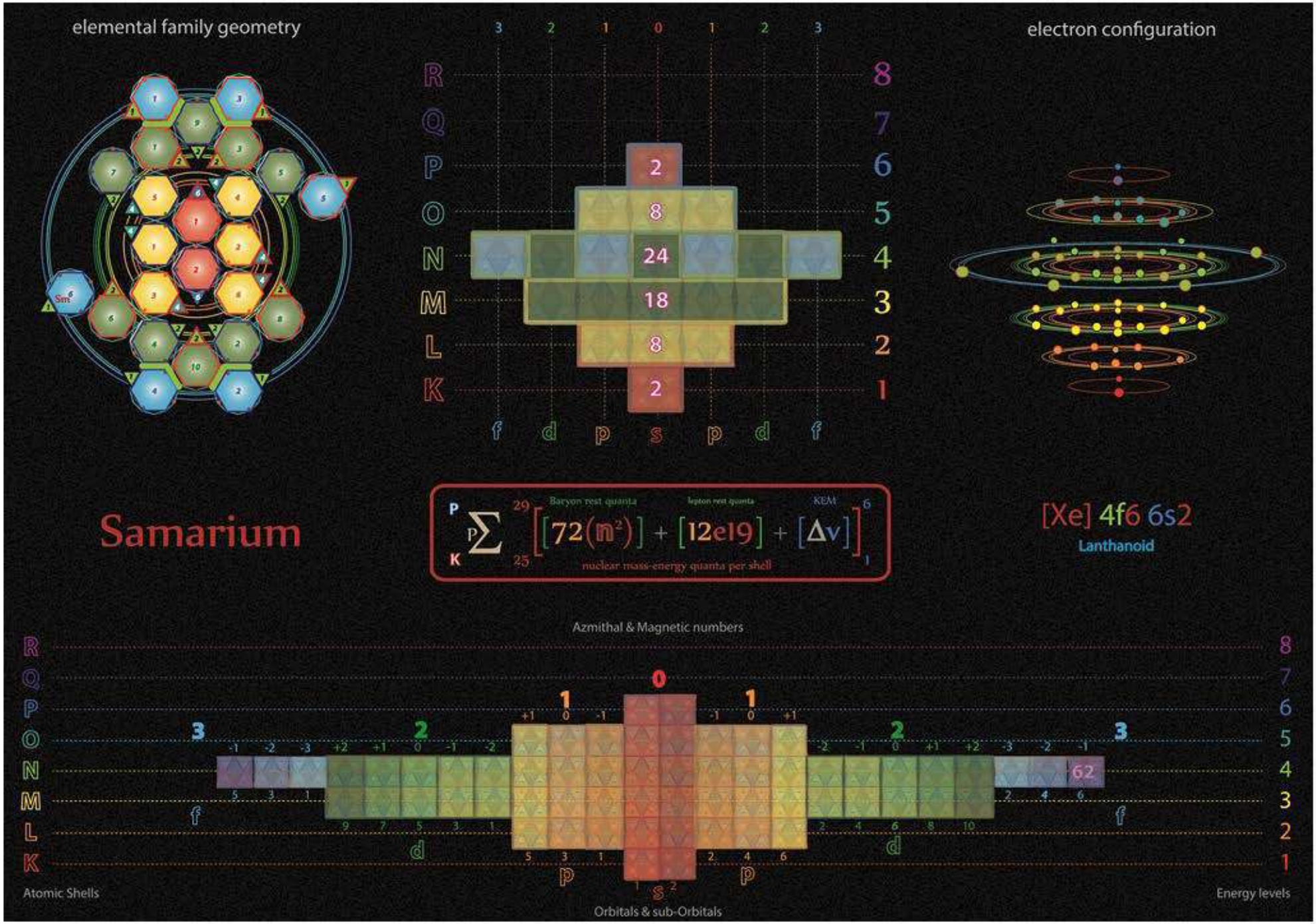

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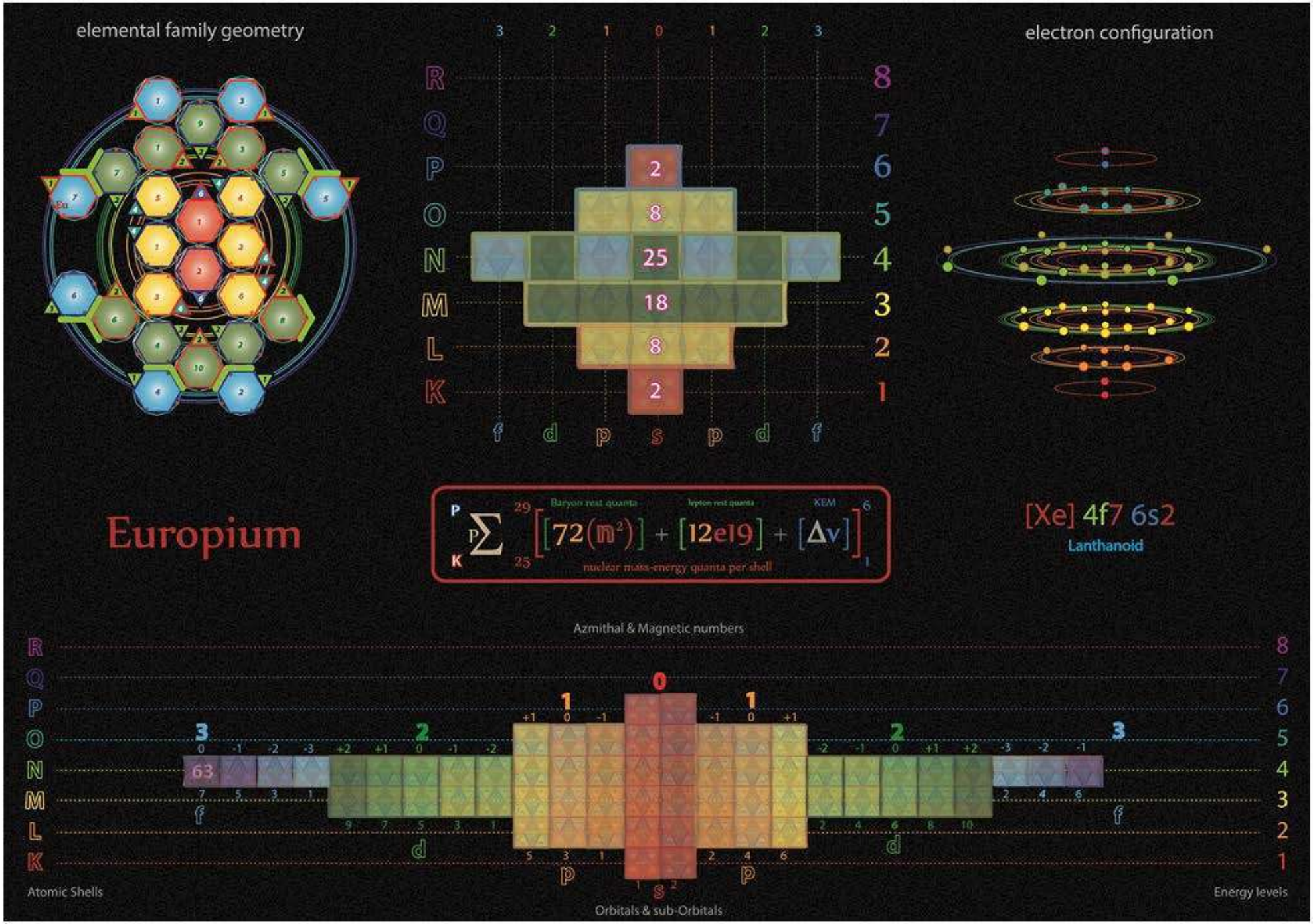

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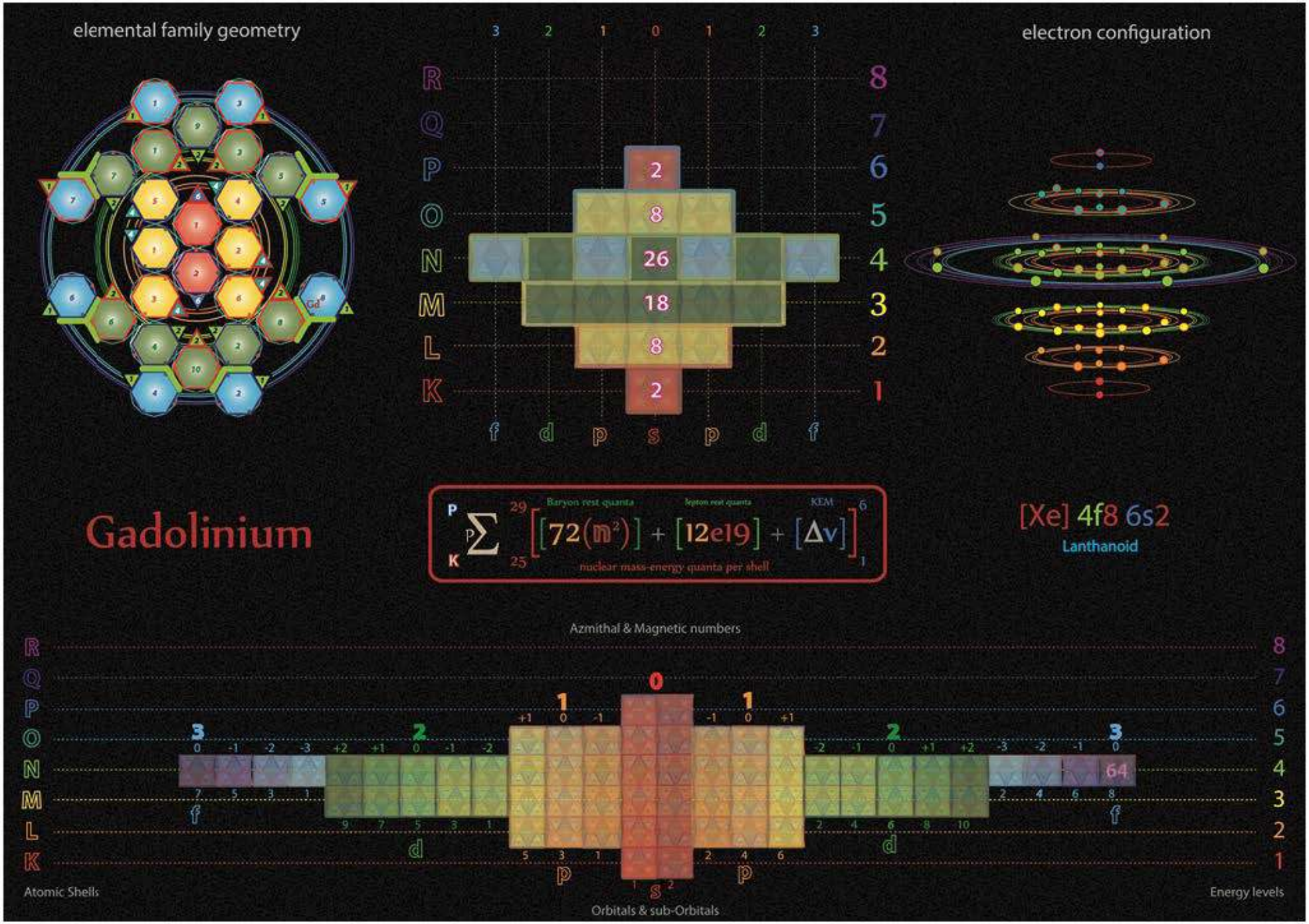

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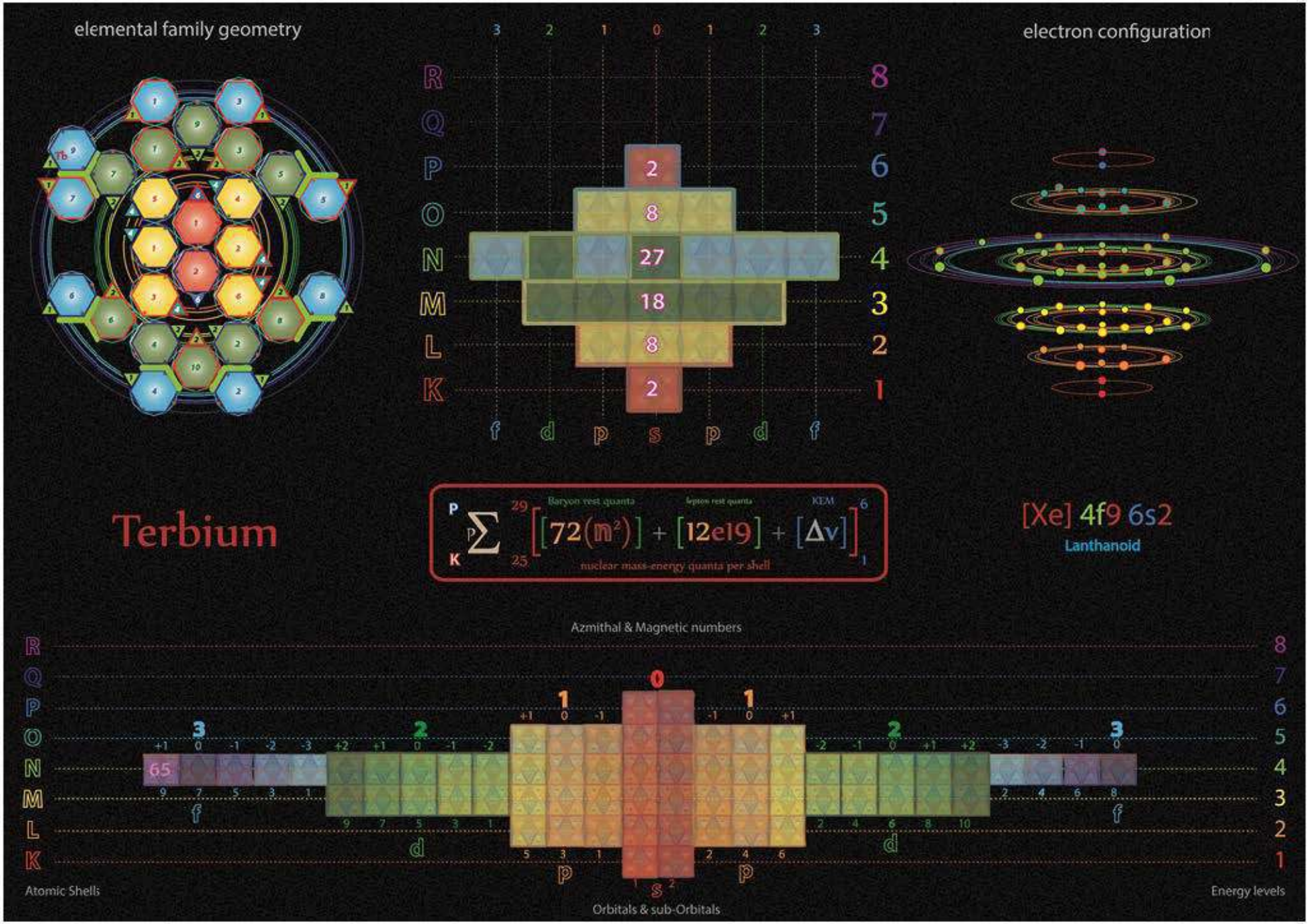

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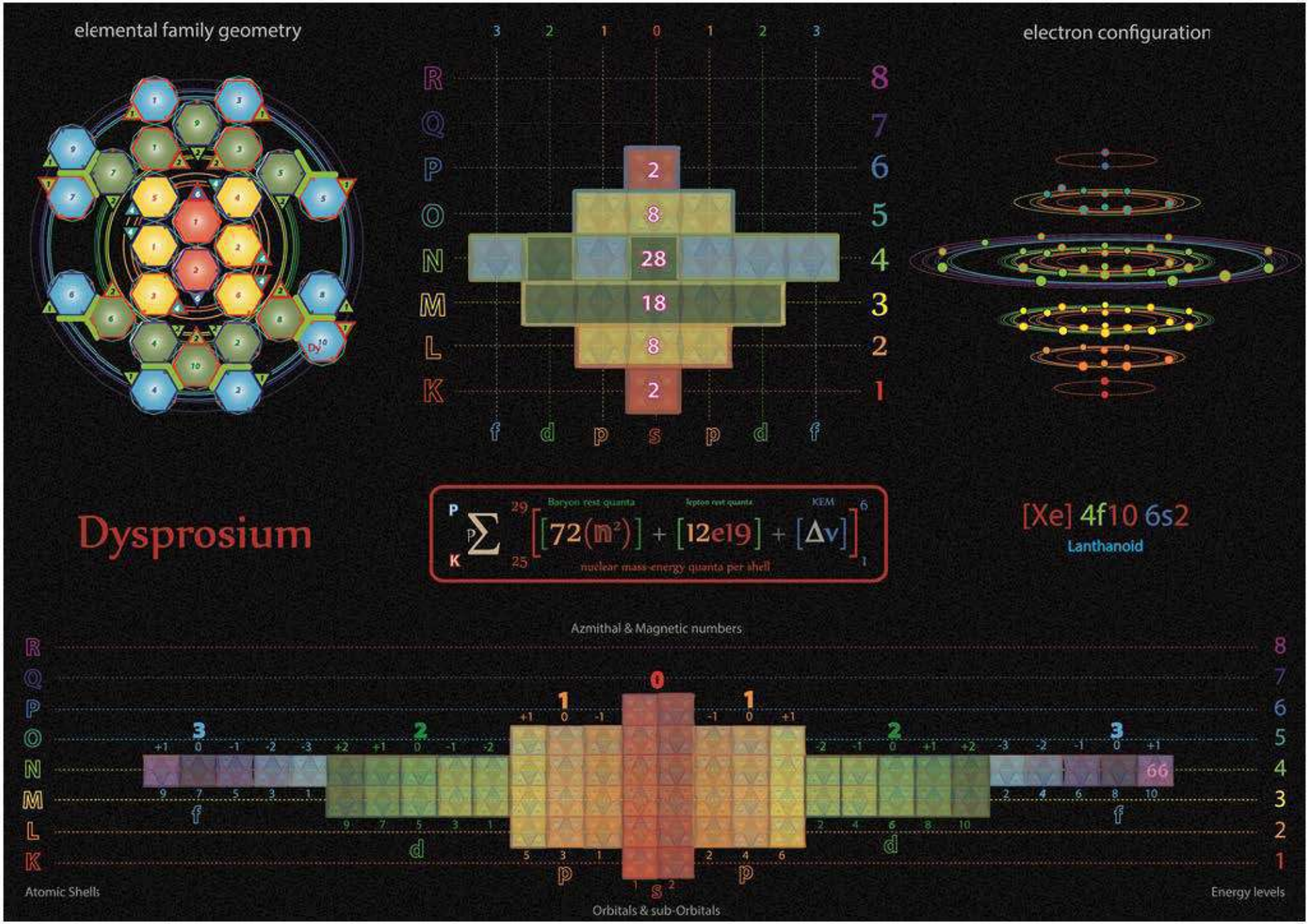

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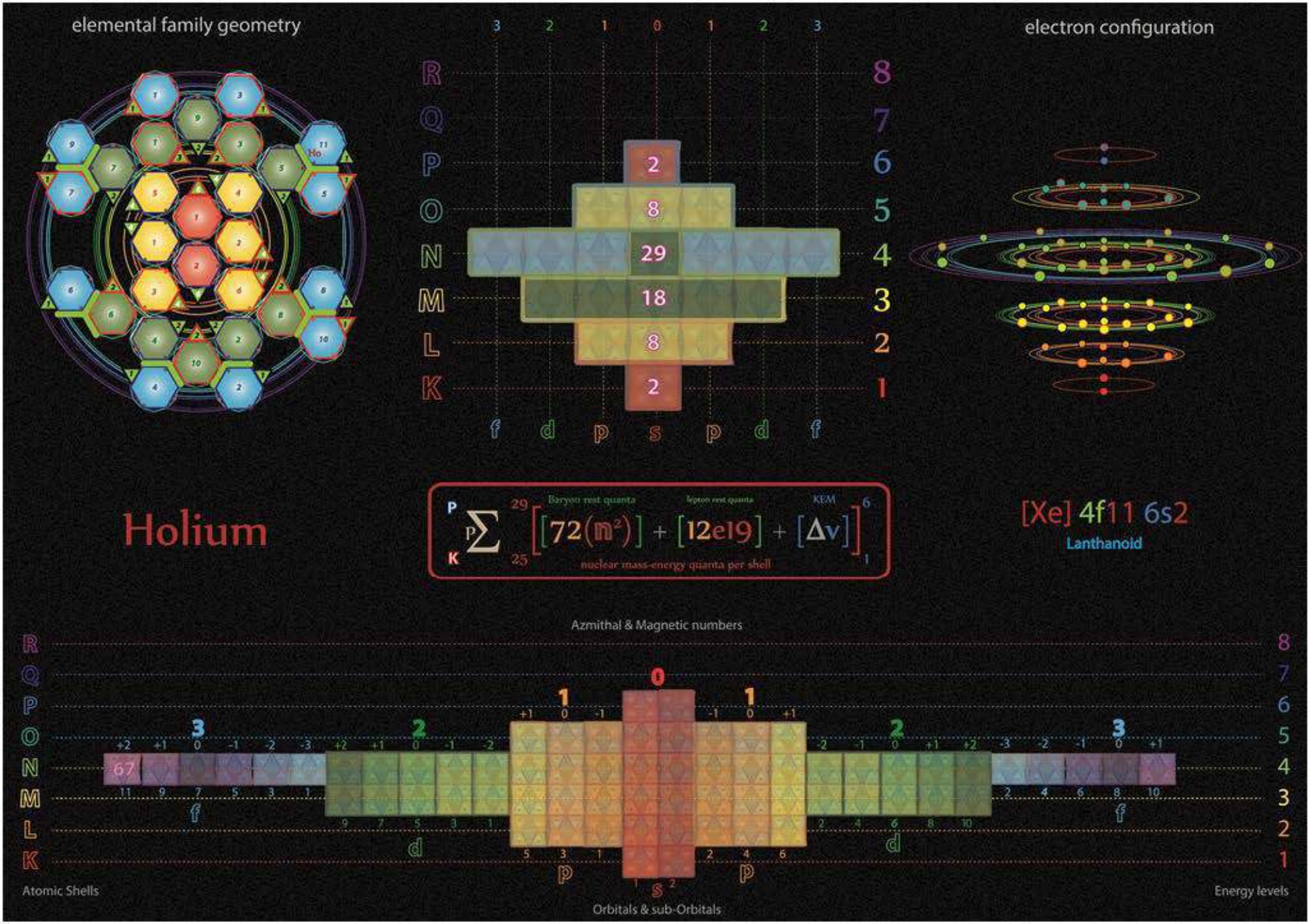

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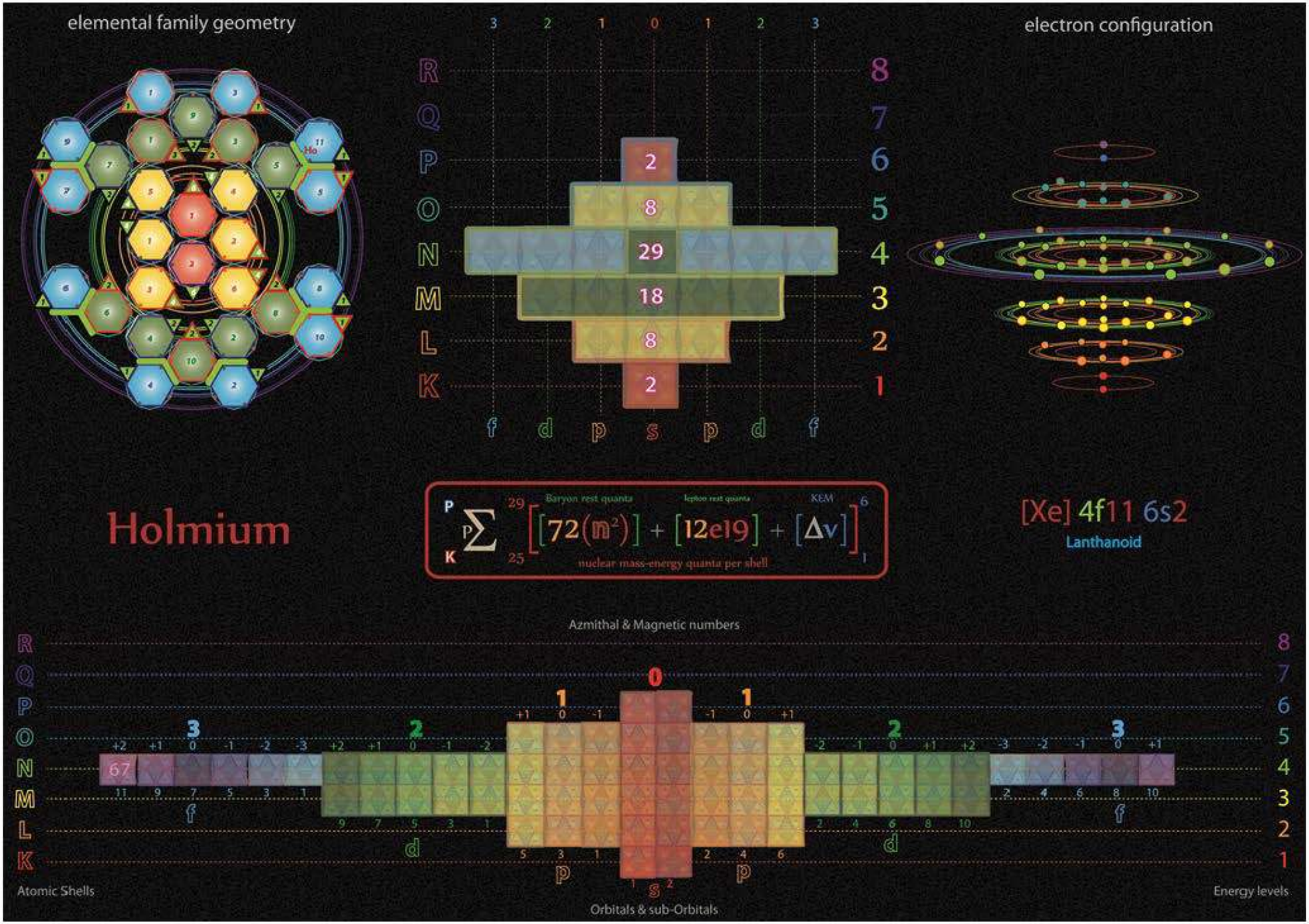

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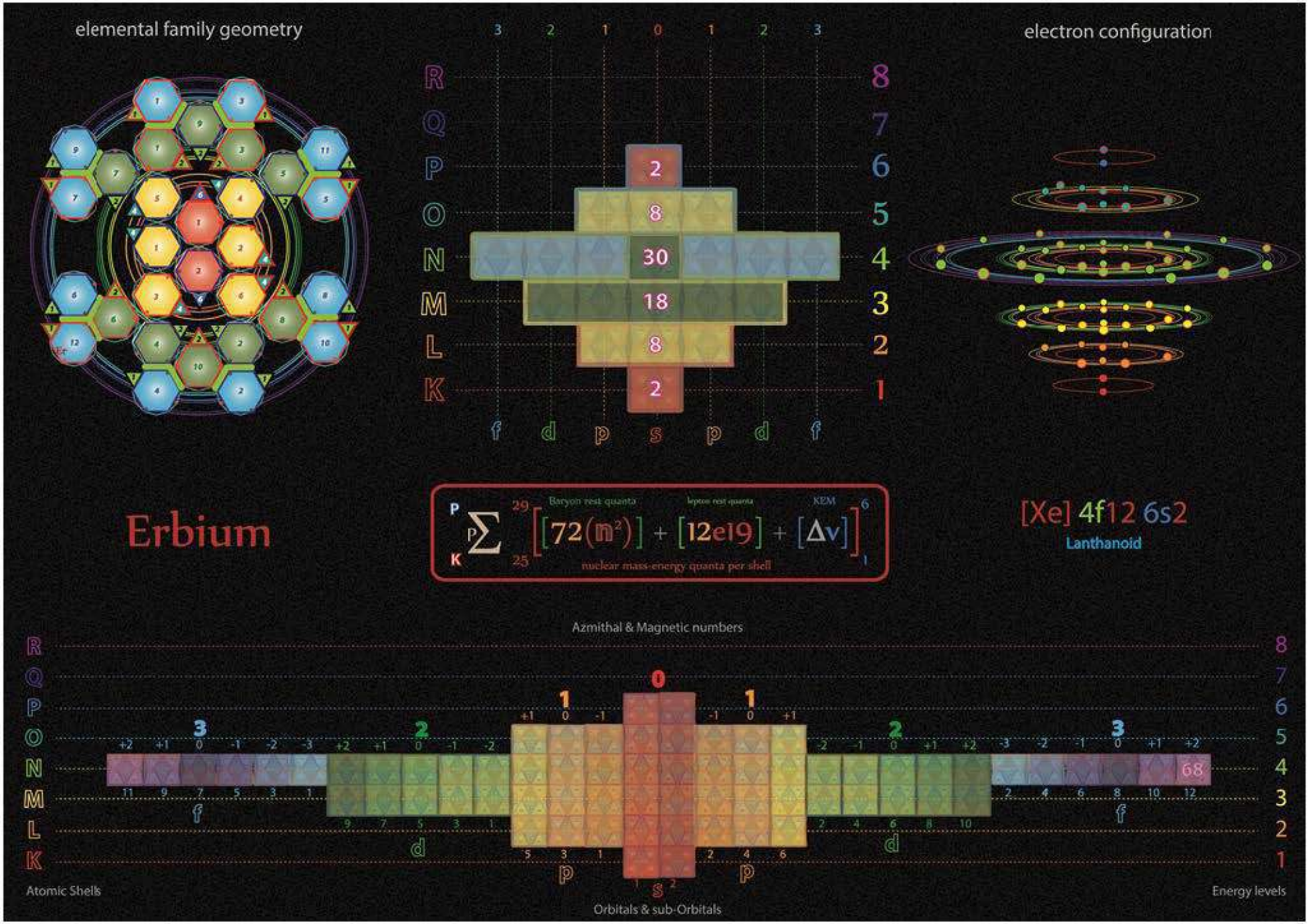

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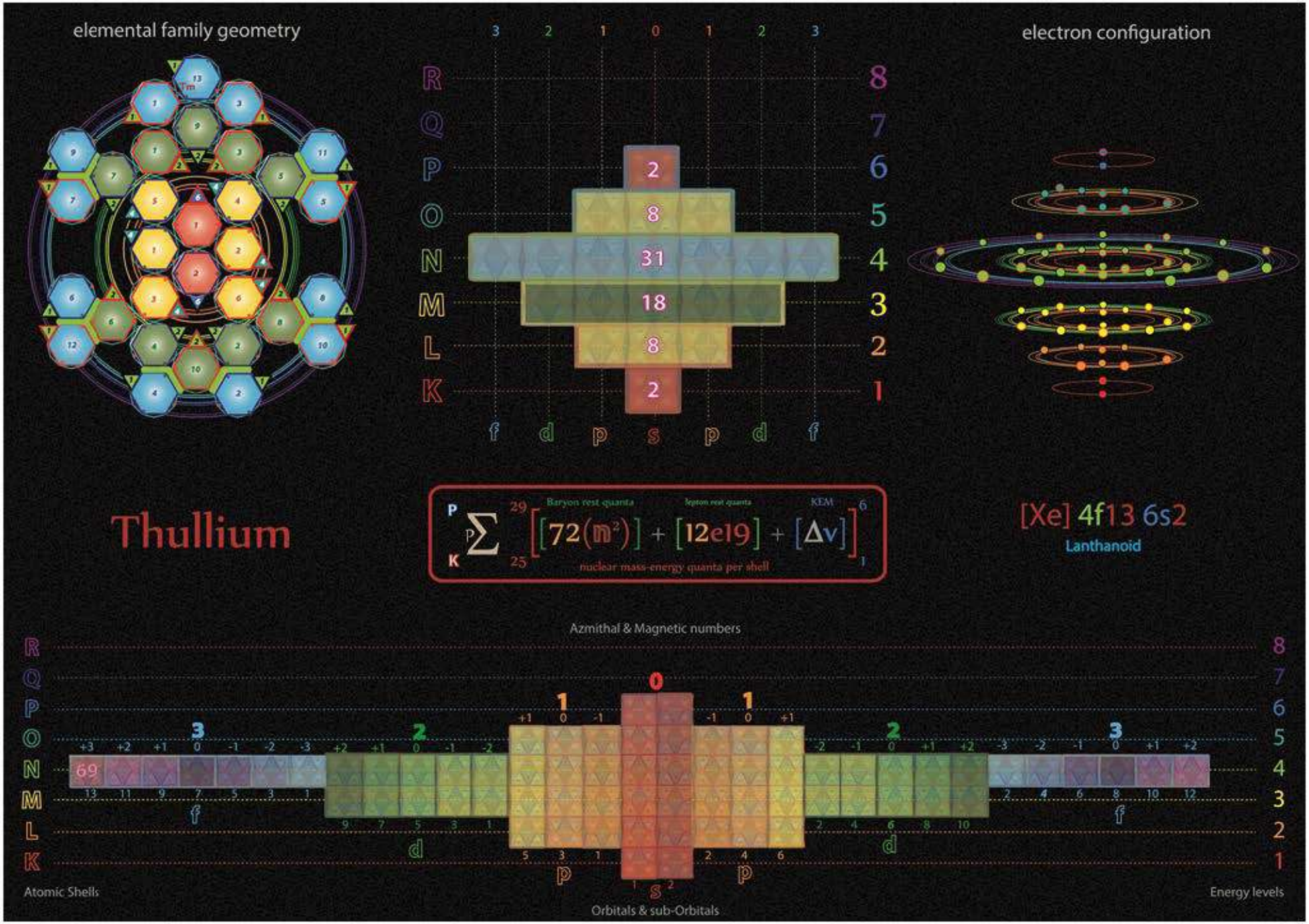

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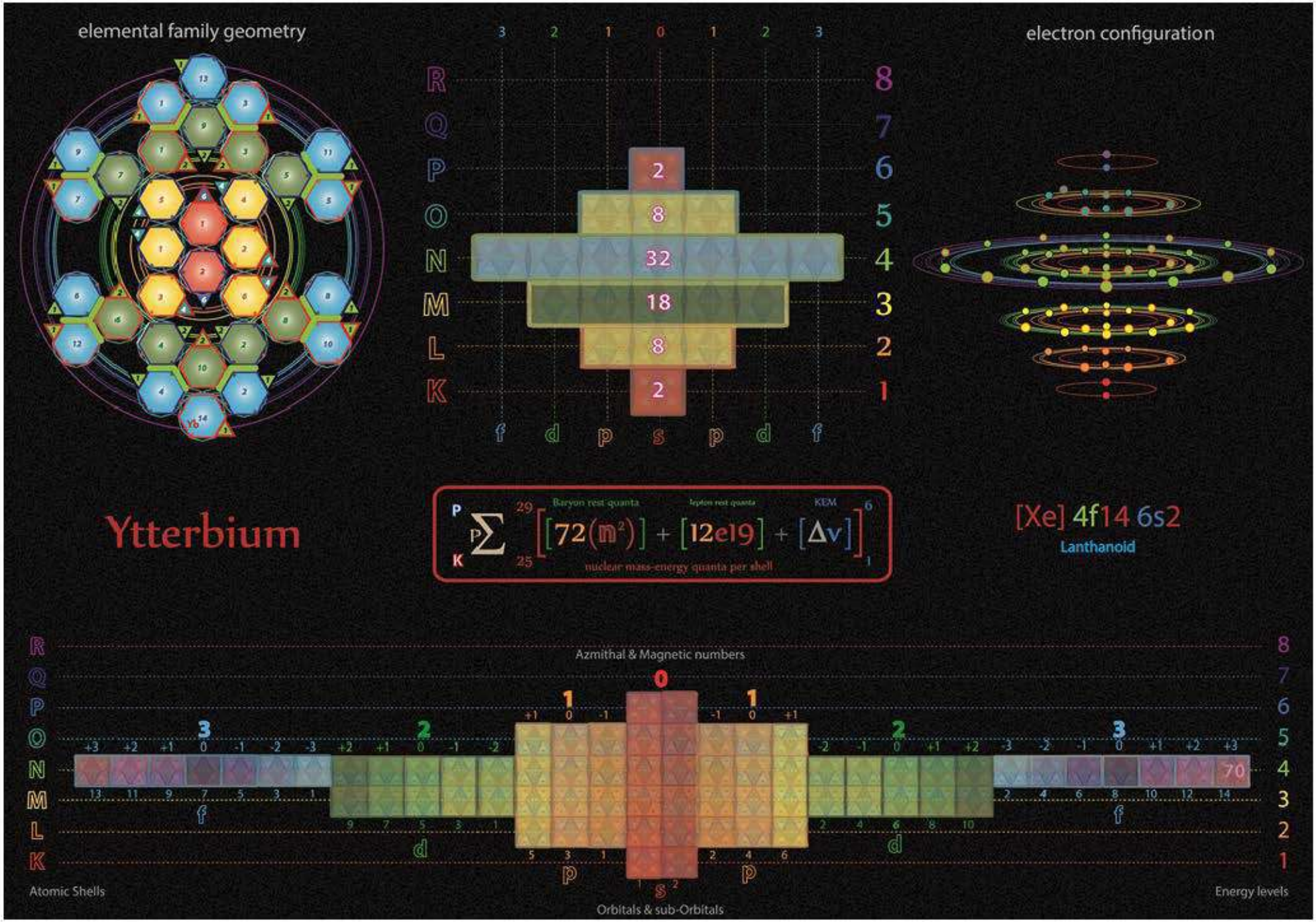

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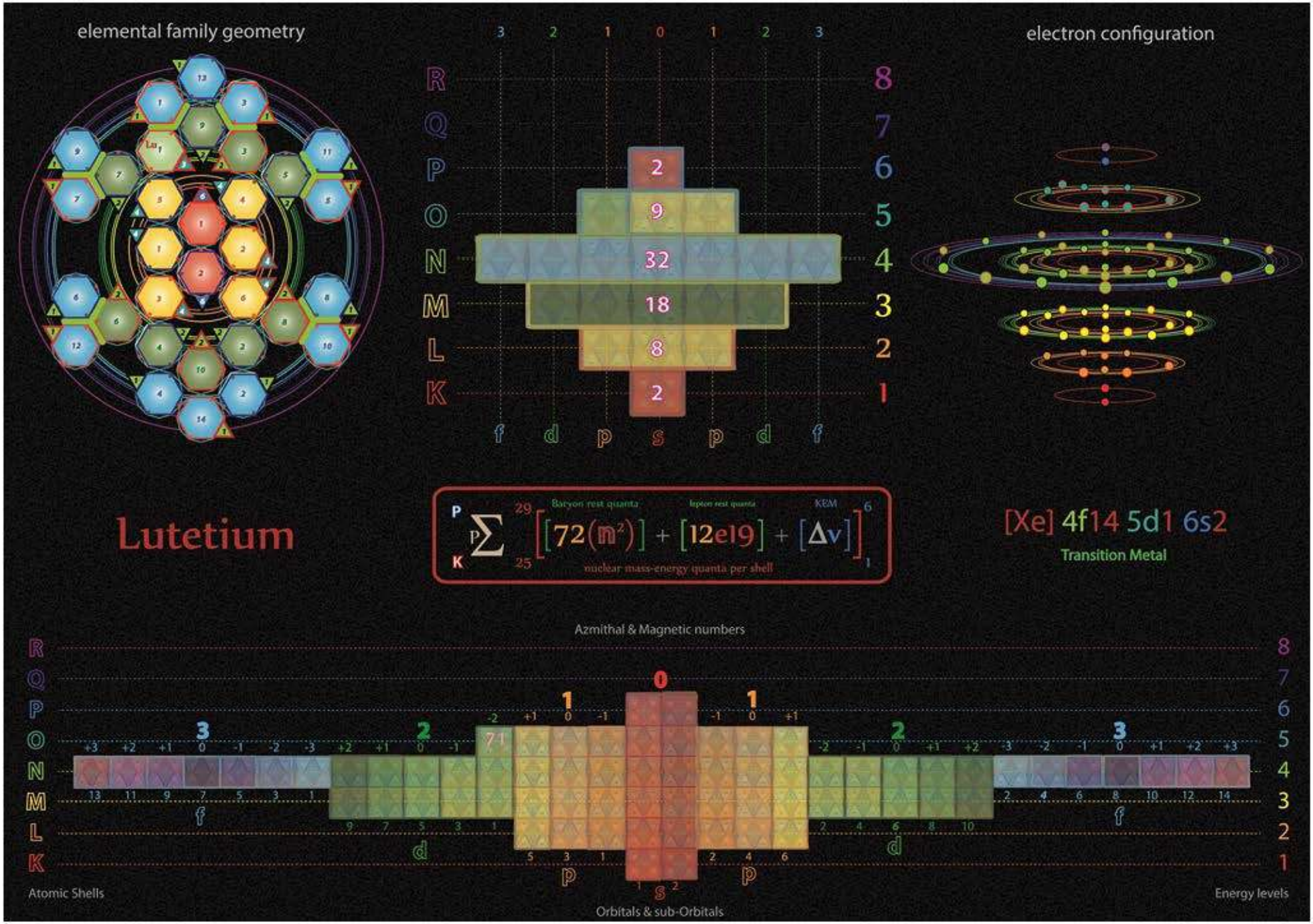

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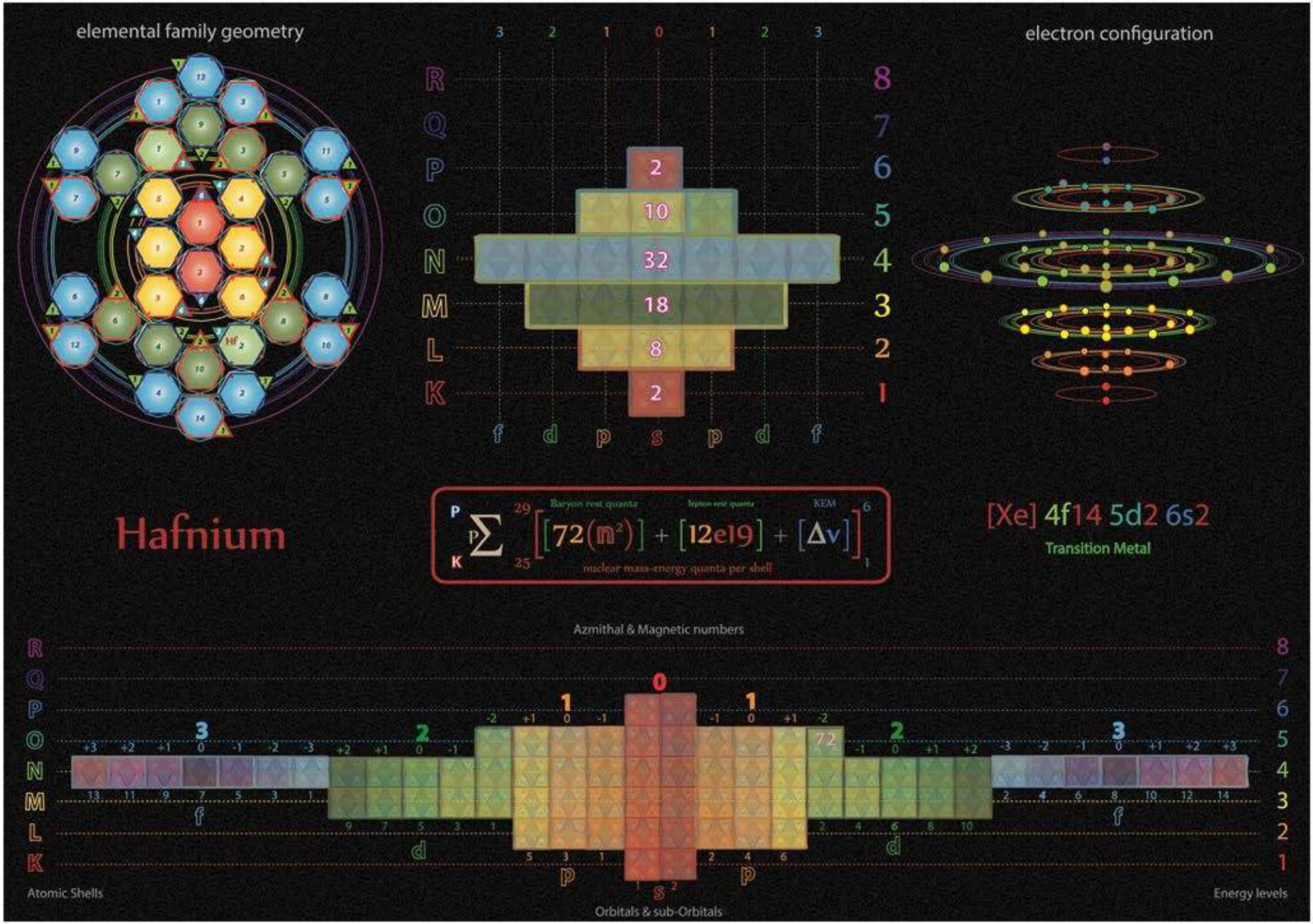

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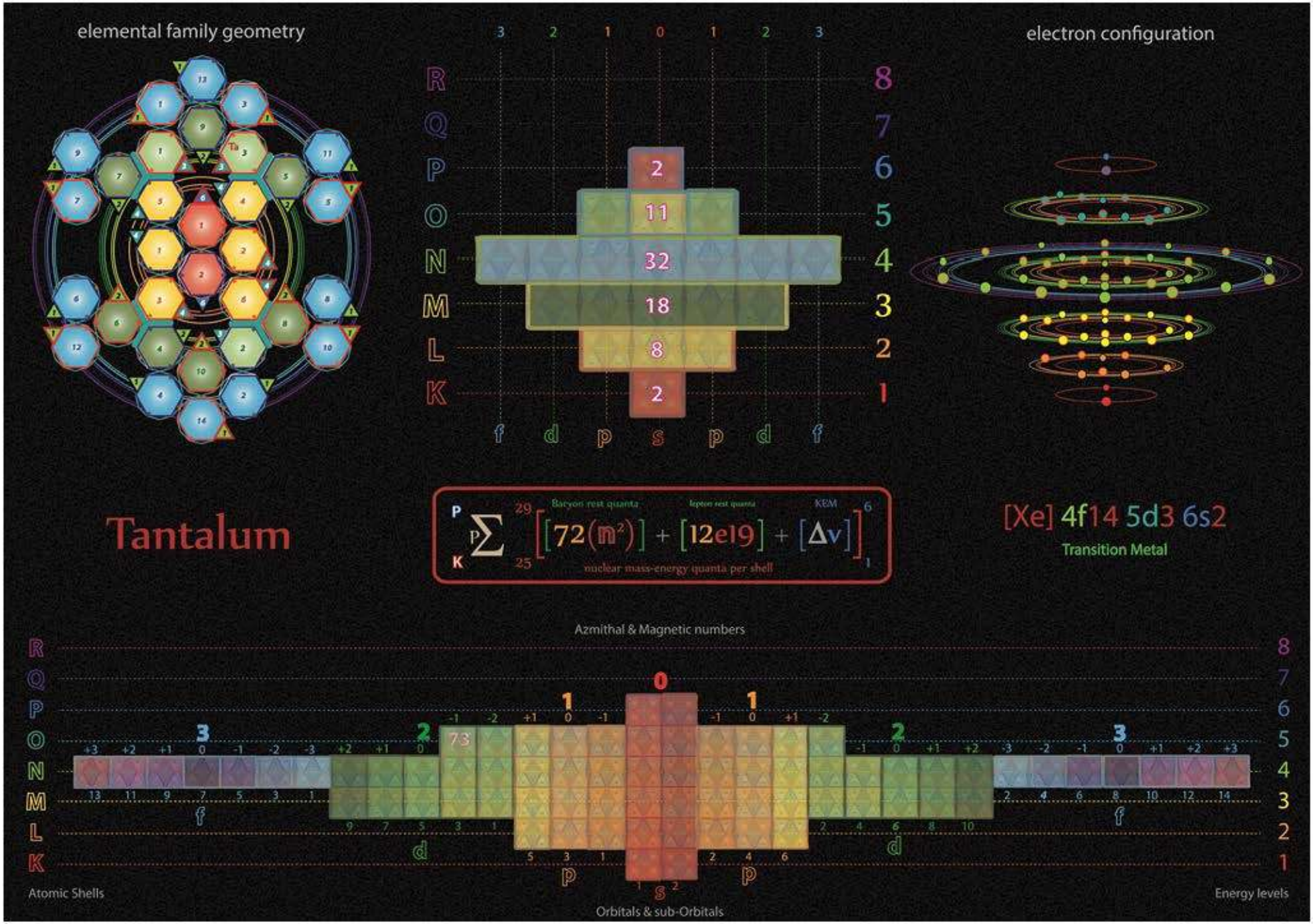

Tetryonics 53.73 - Tantalum atomic config

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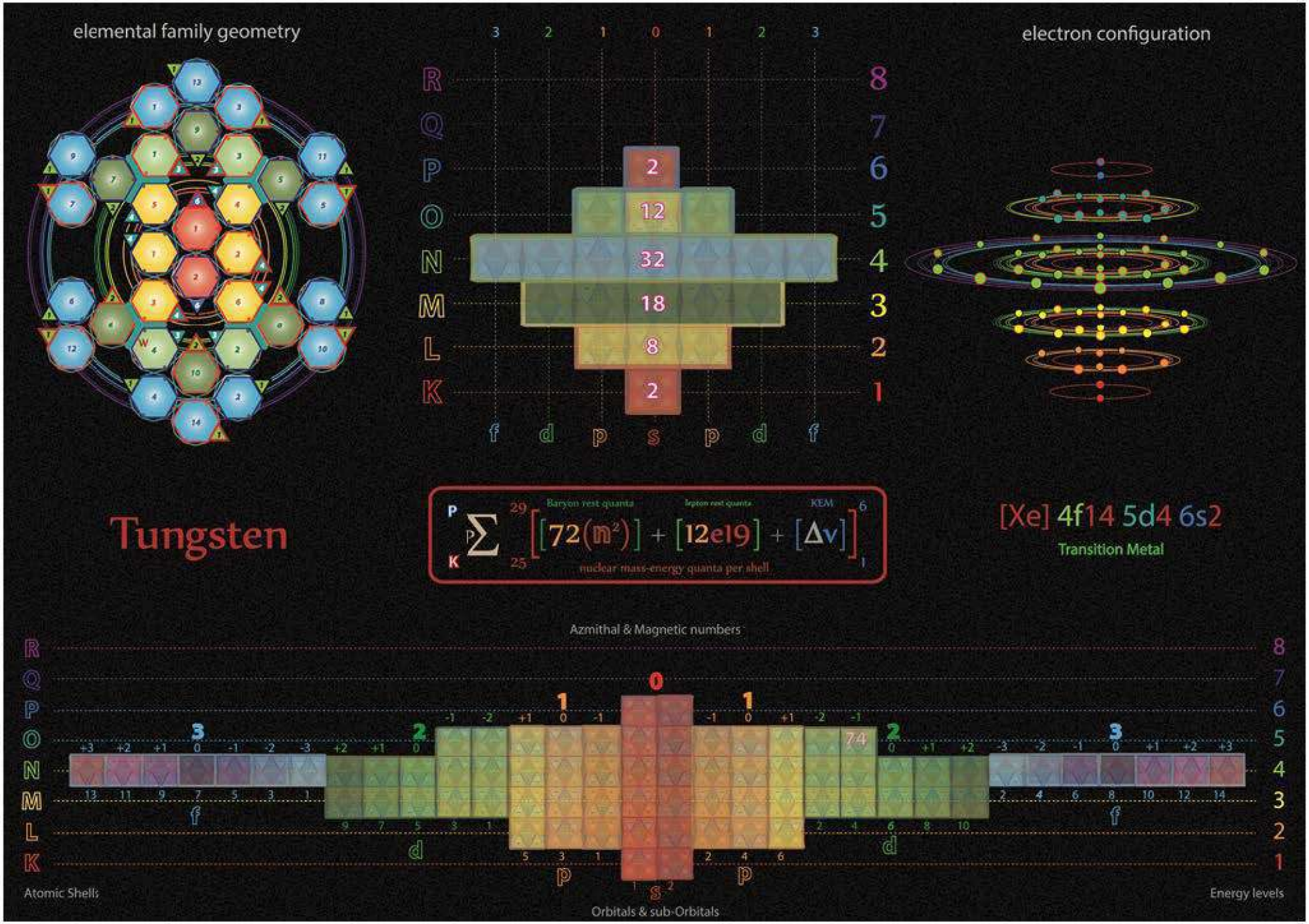

Tetryonics 53.74 - Tungsten atomic config

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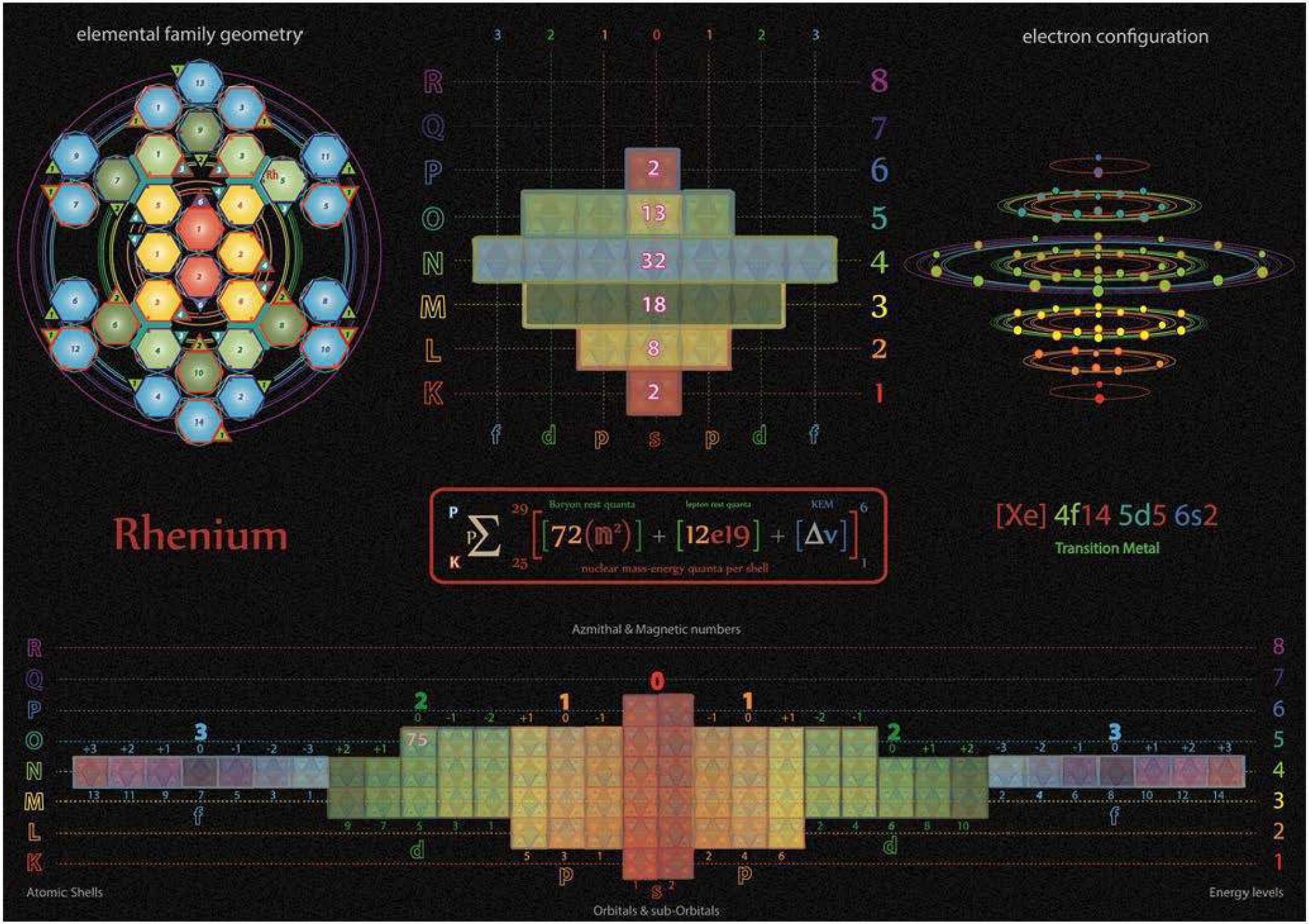

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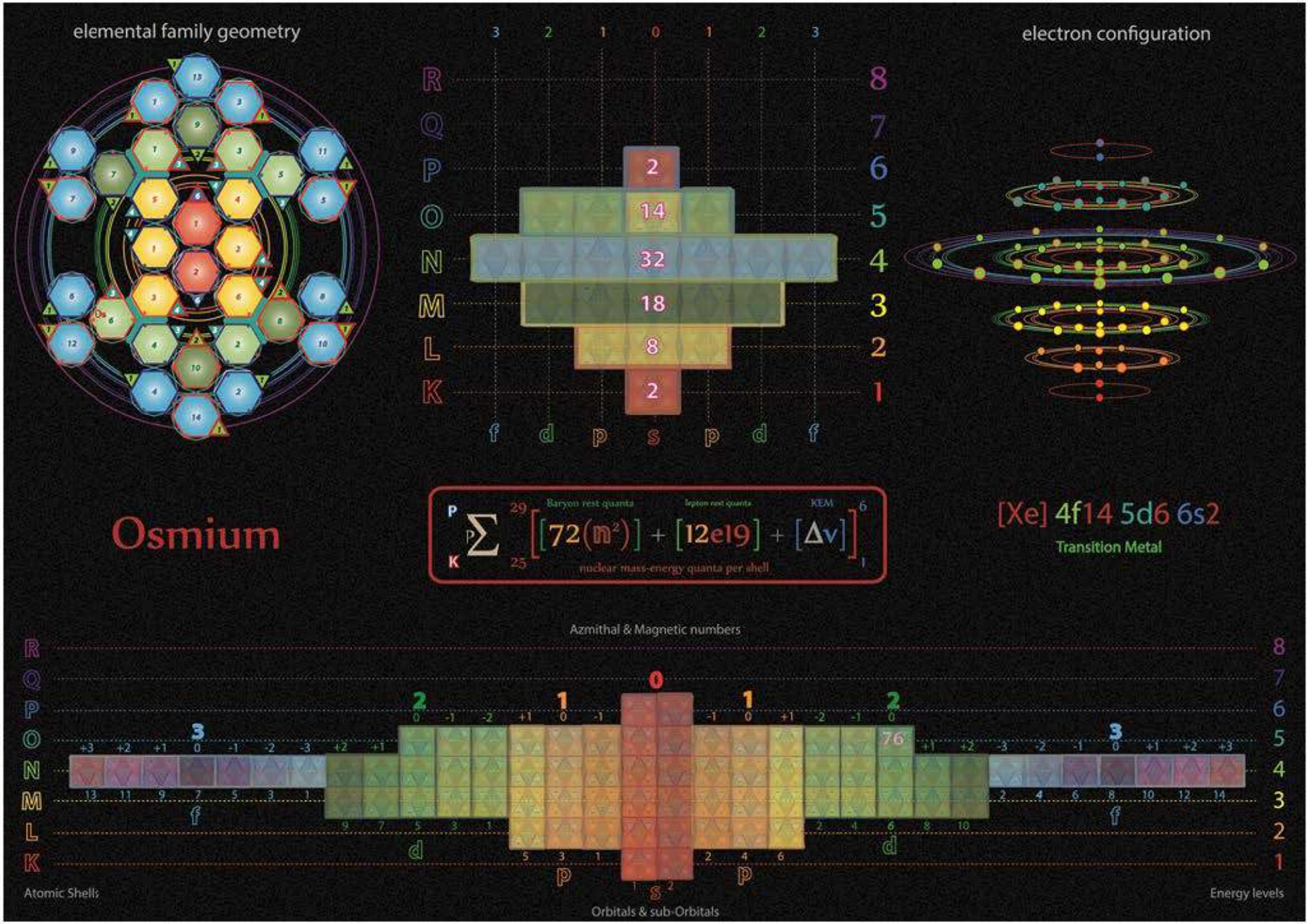

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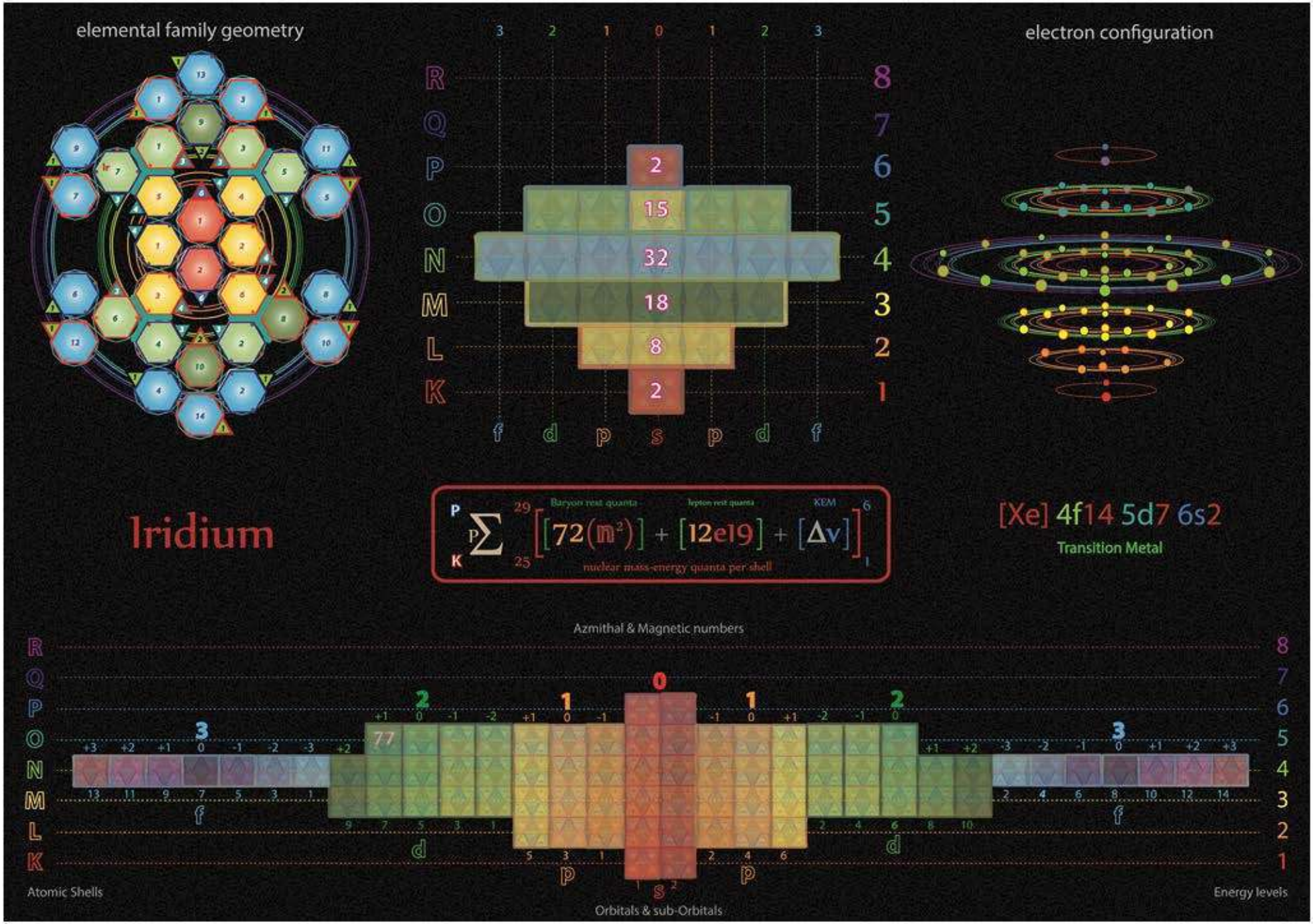

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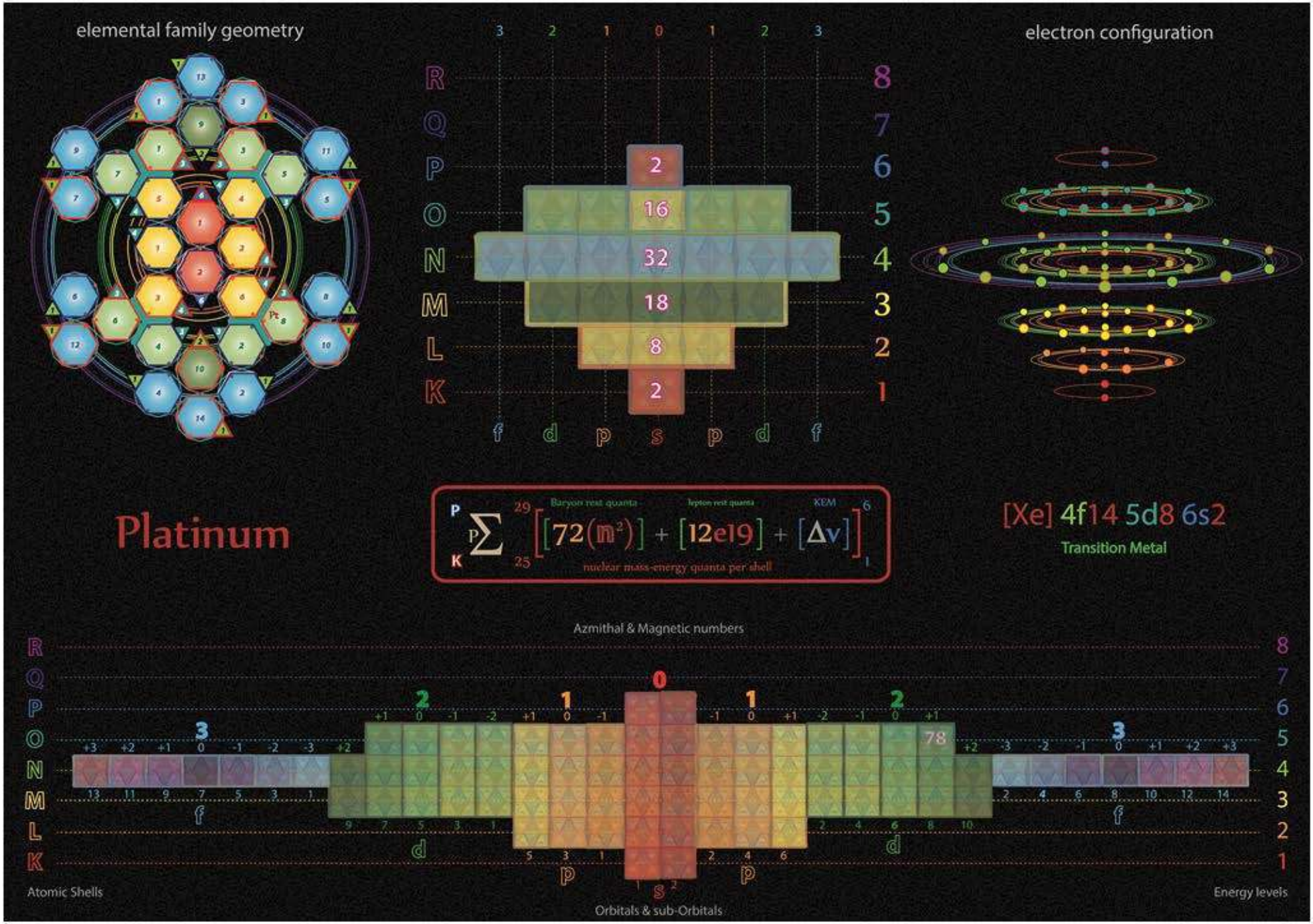

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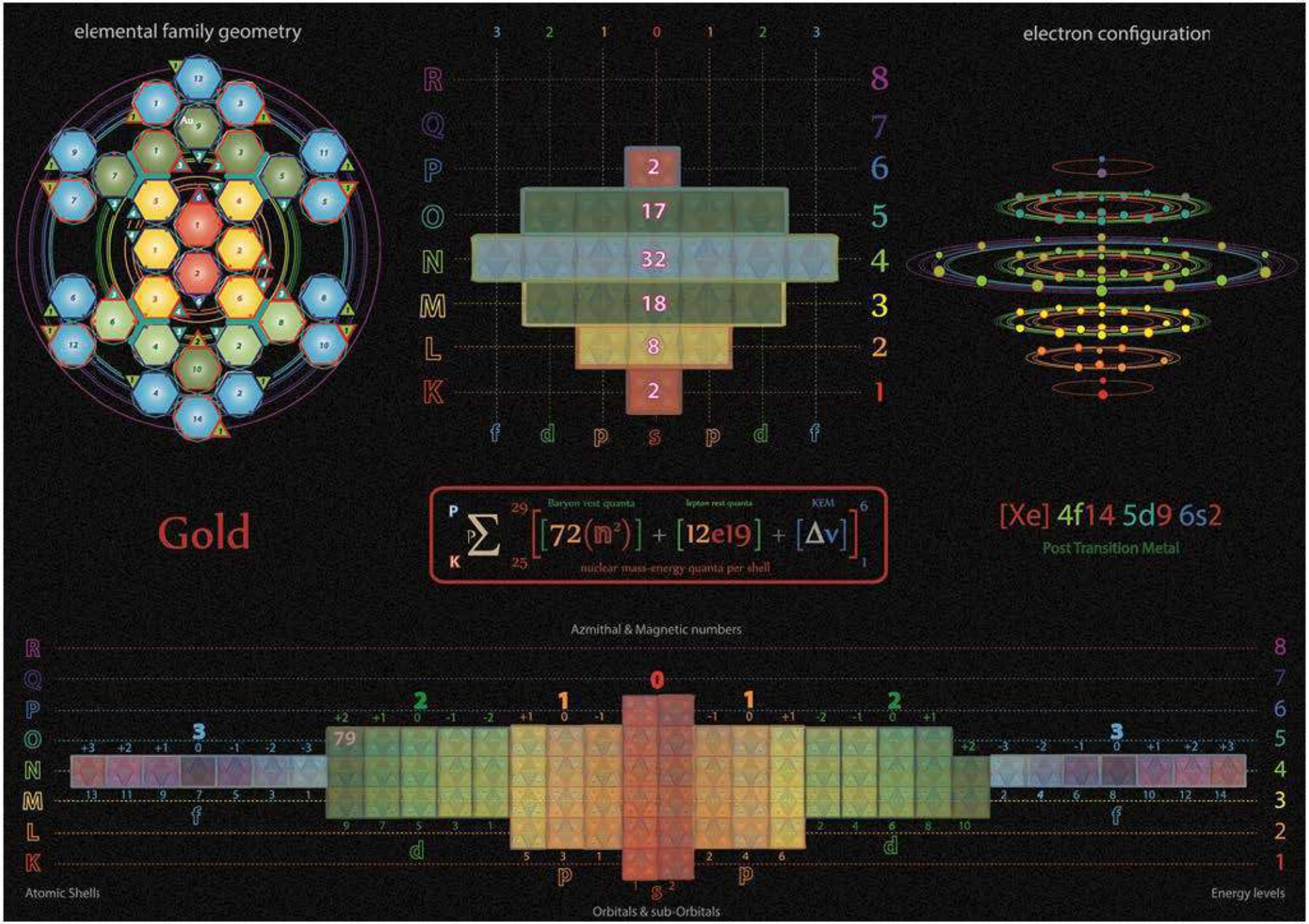

Tetryonics 53.79 - Gold atomic config

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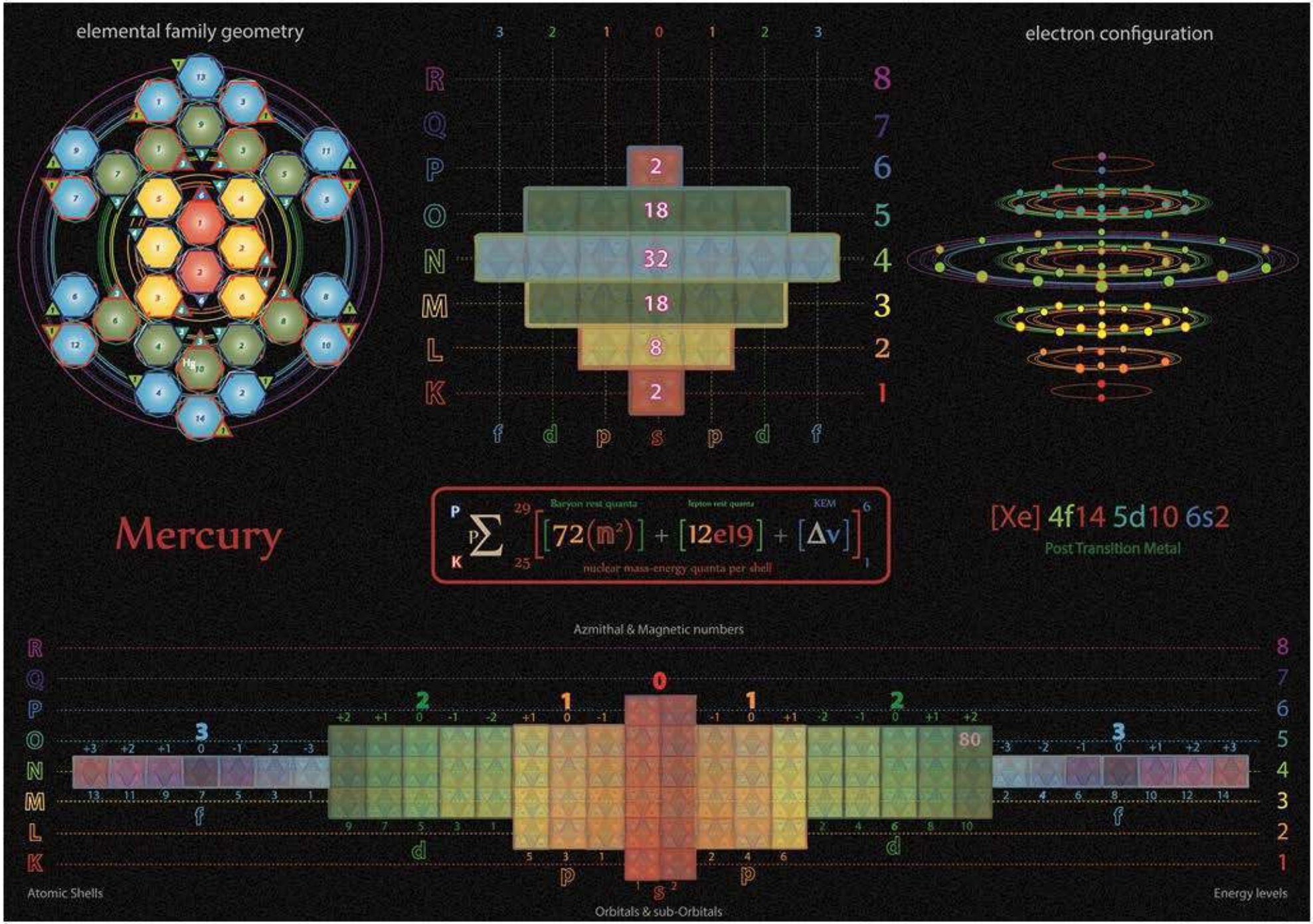

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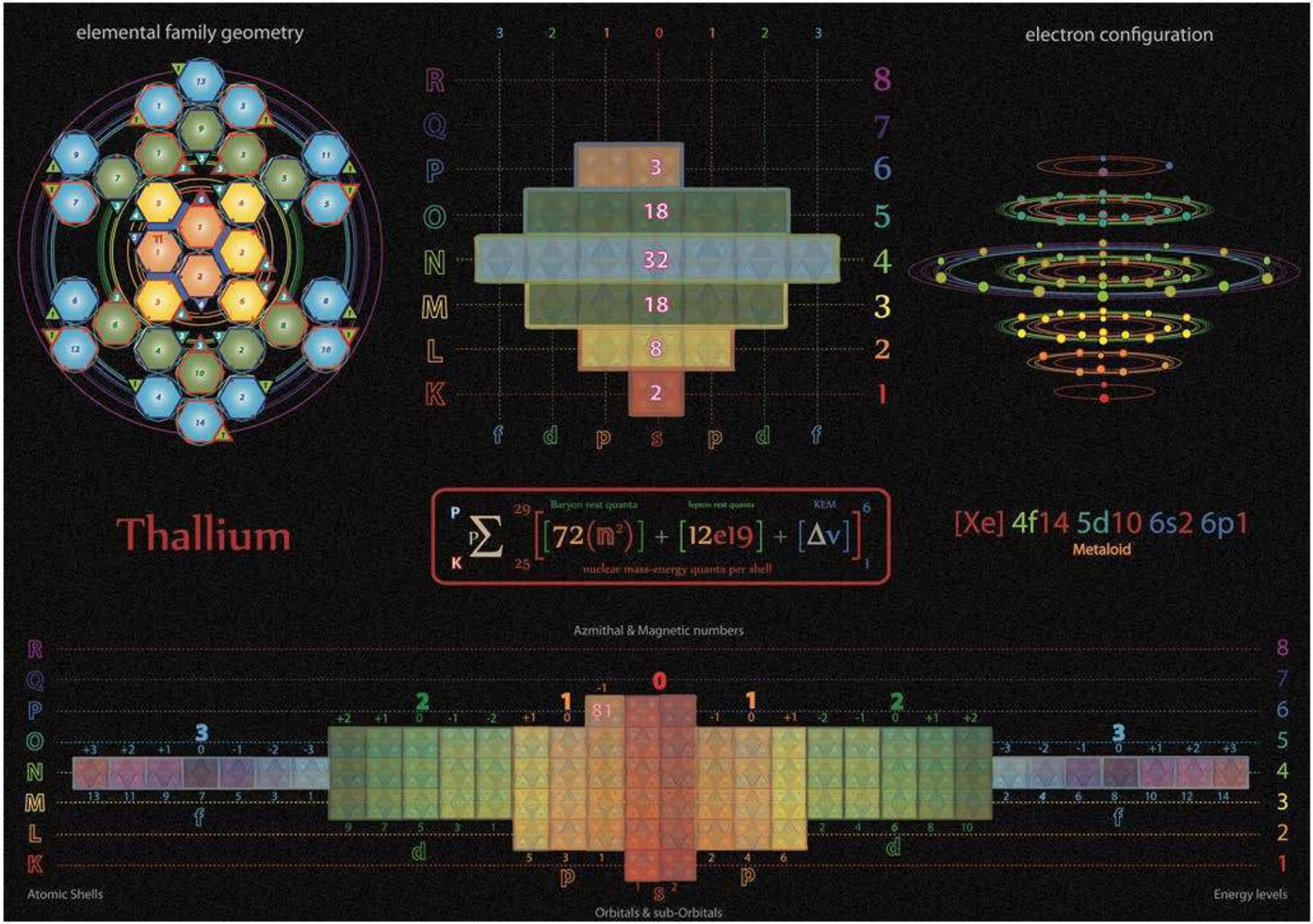

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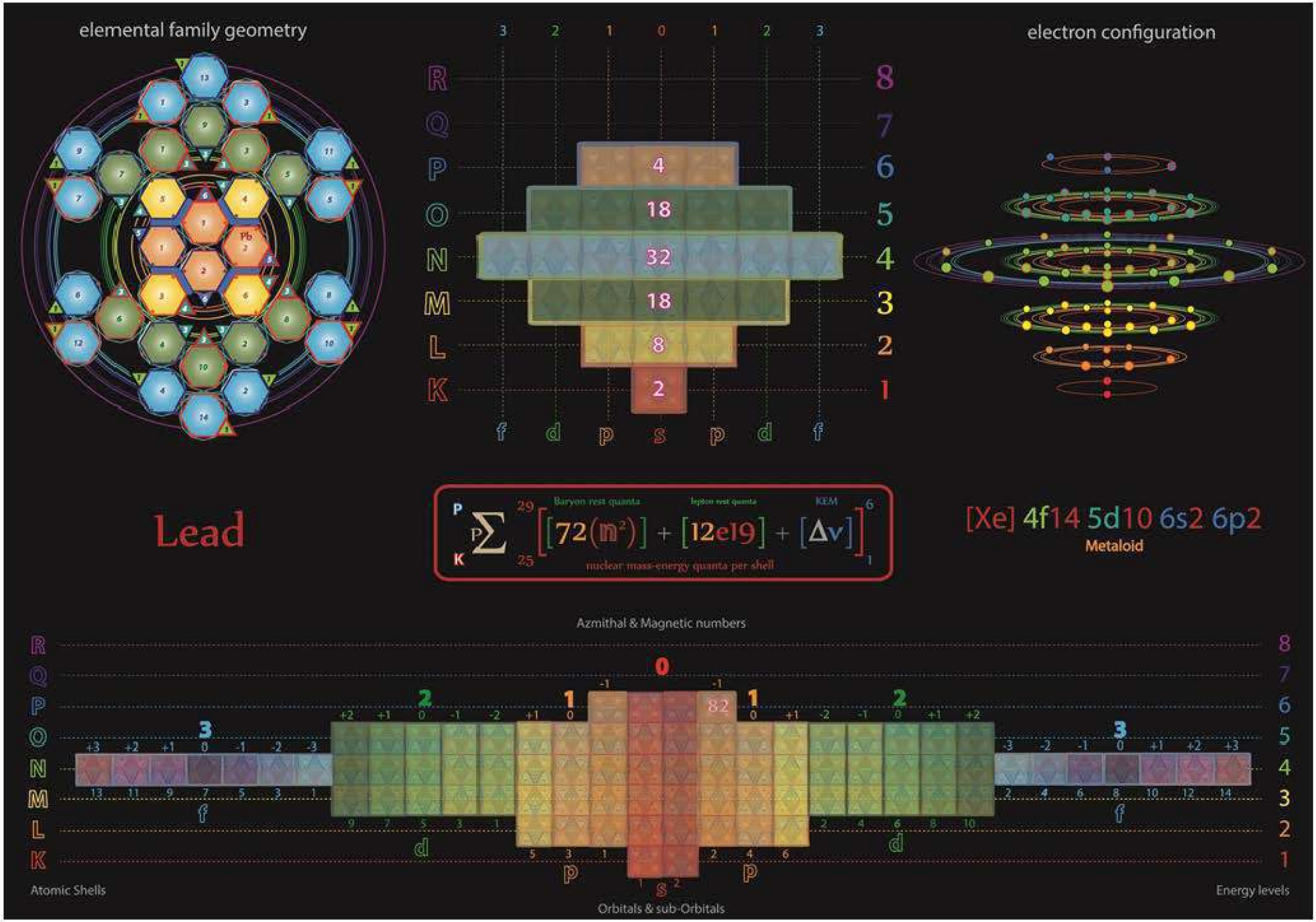

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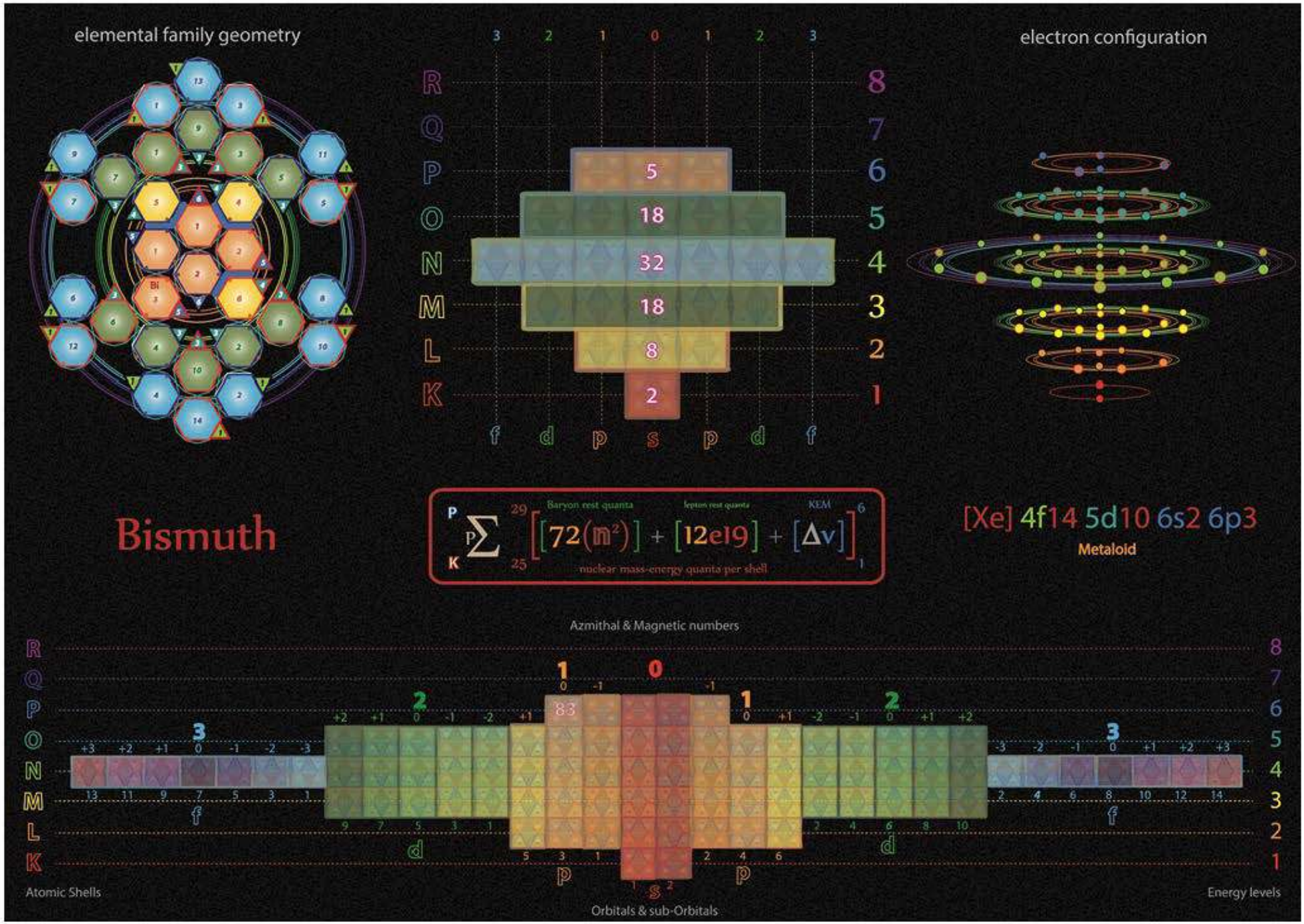

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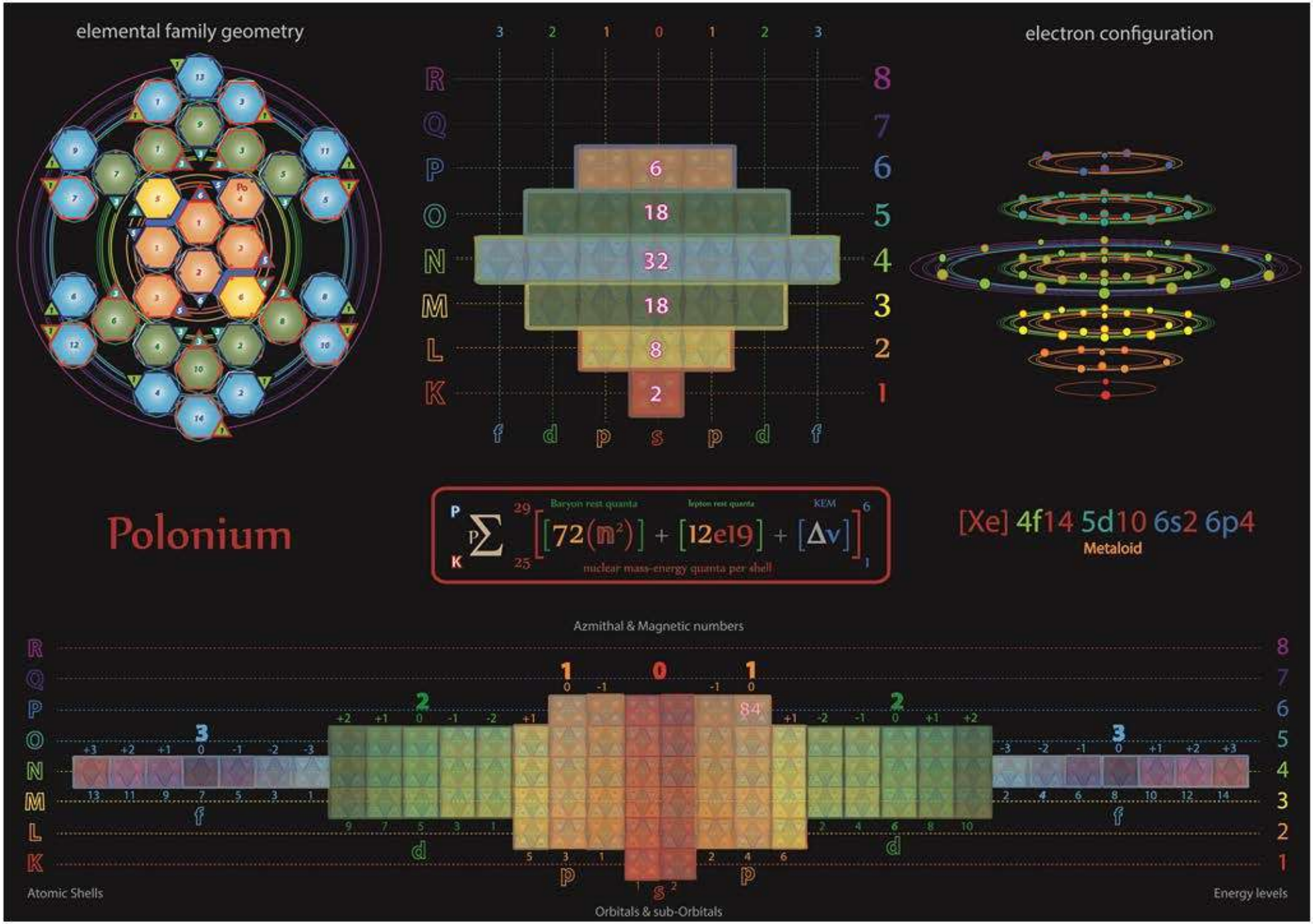

Tetryonics 53.84 - Polonium atomic config

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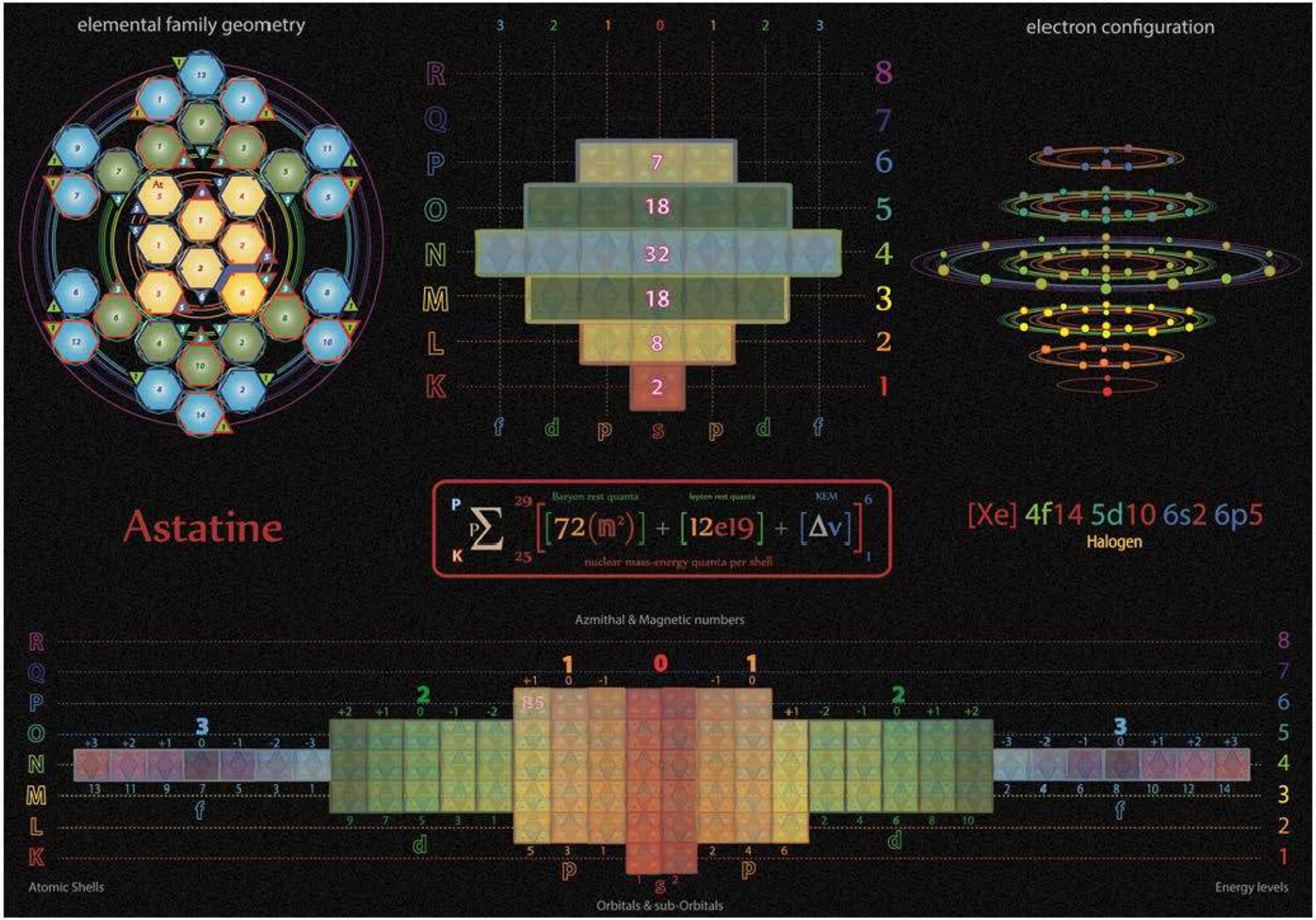

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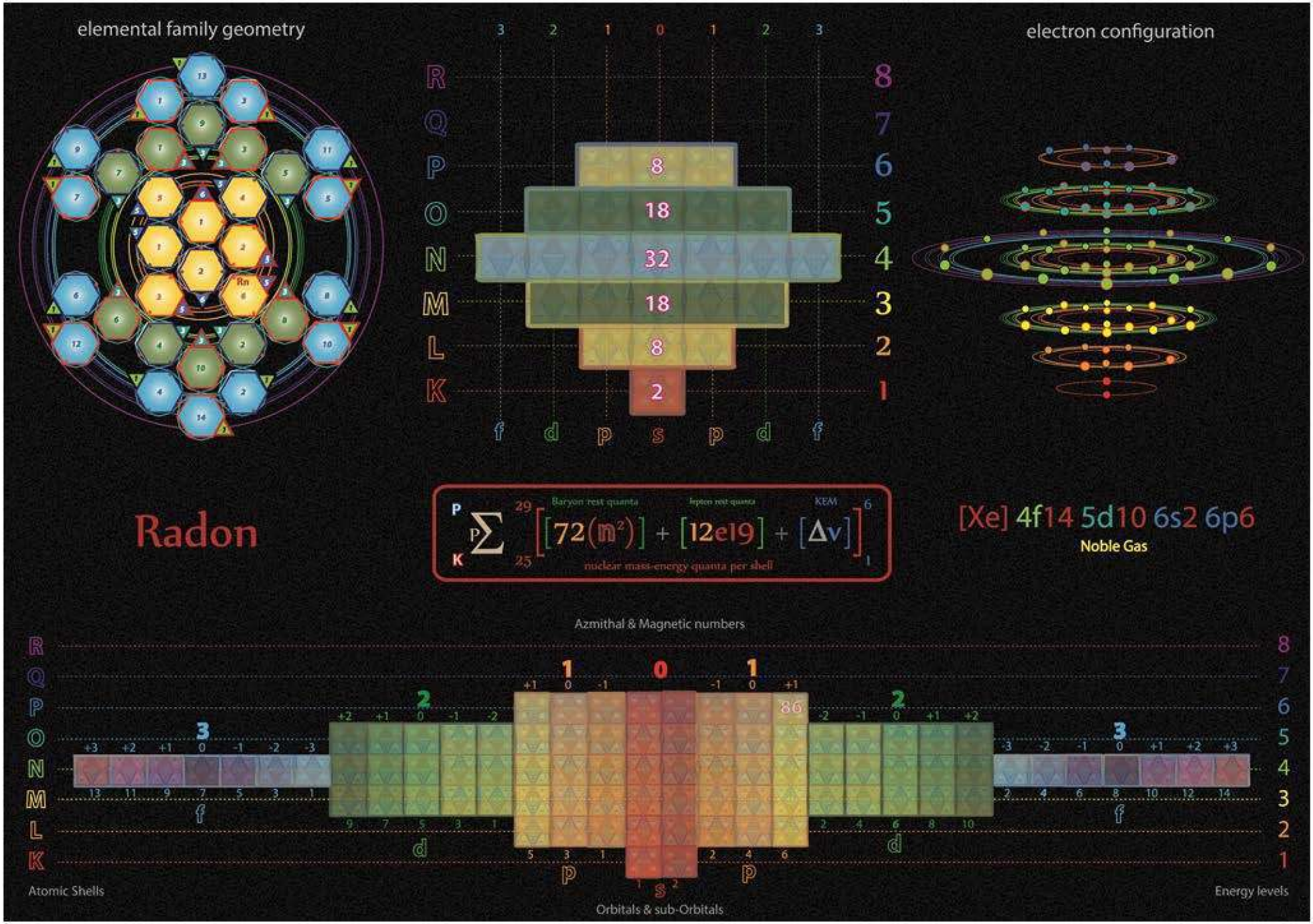

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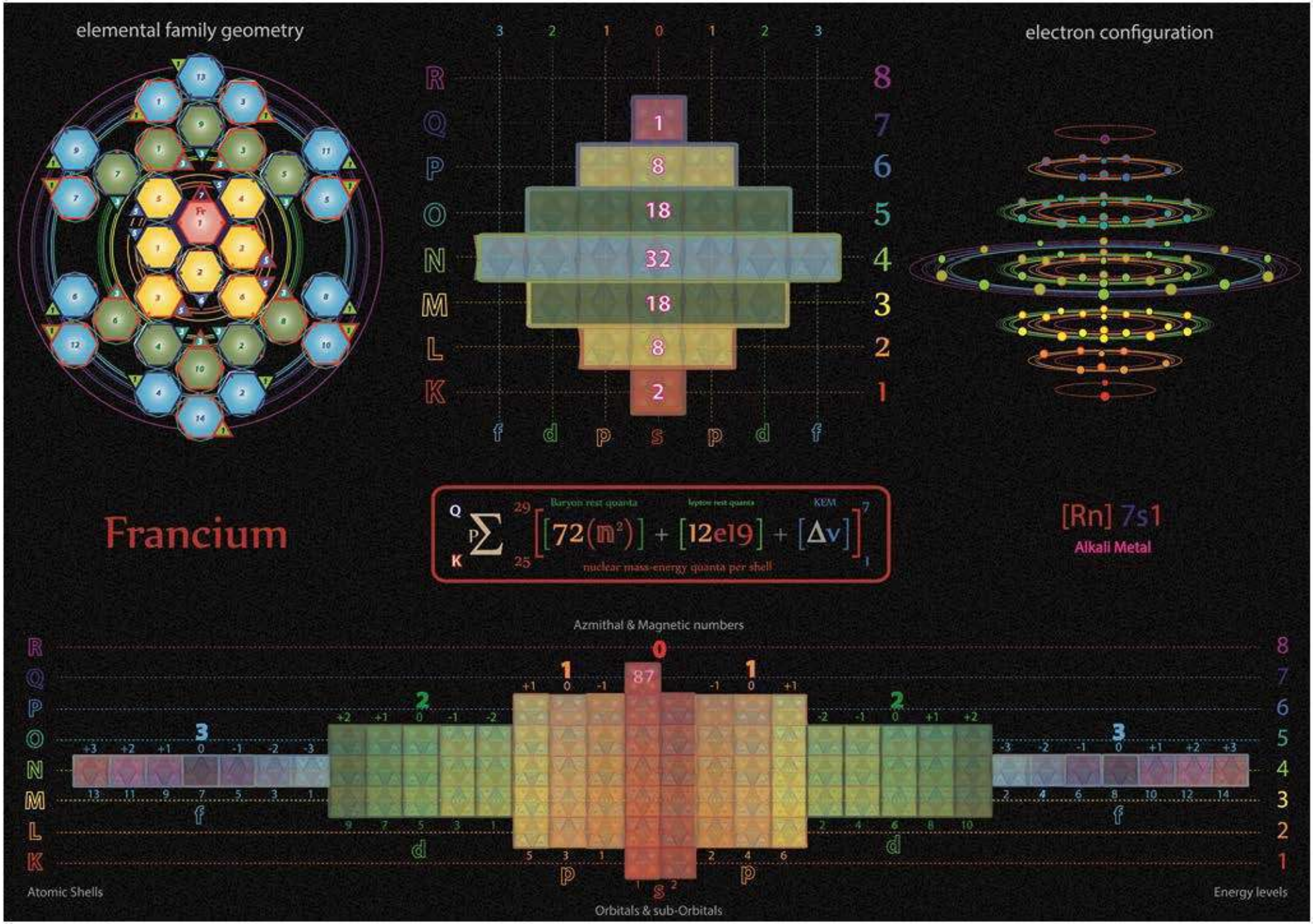

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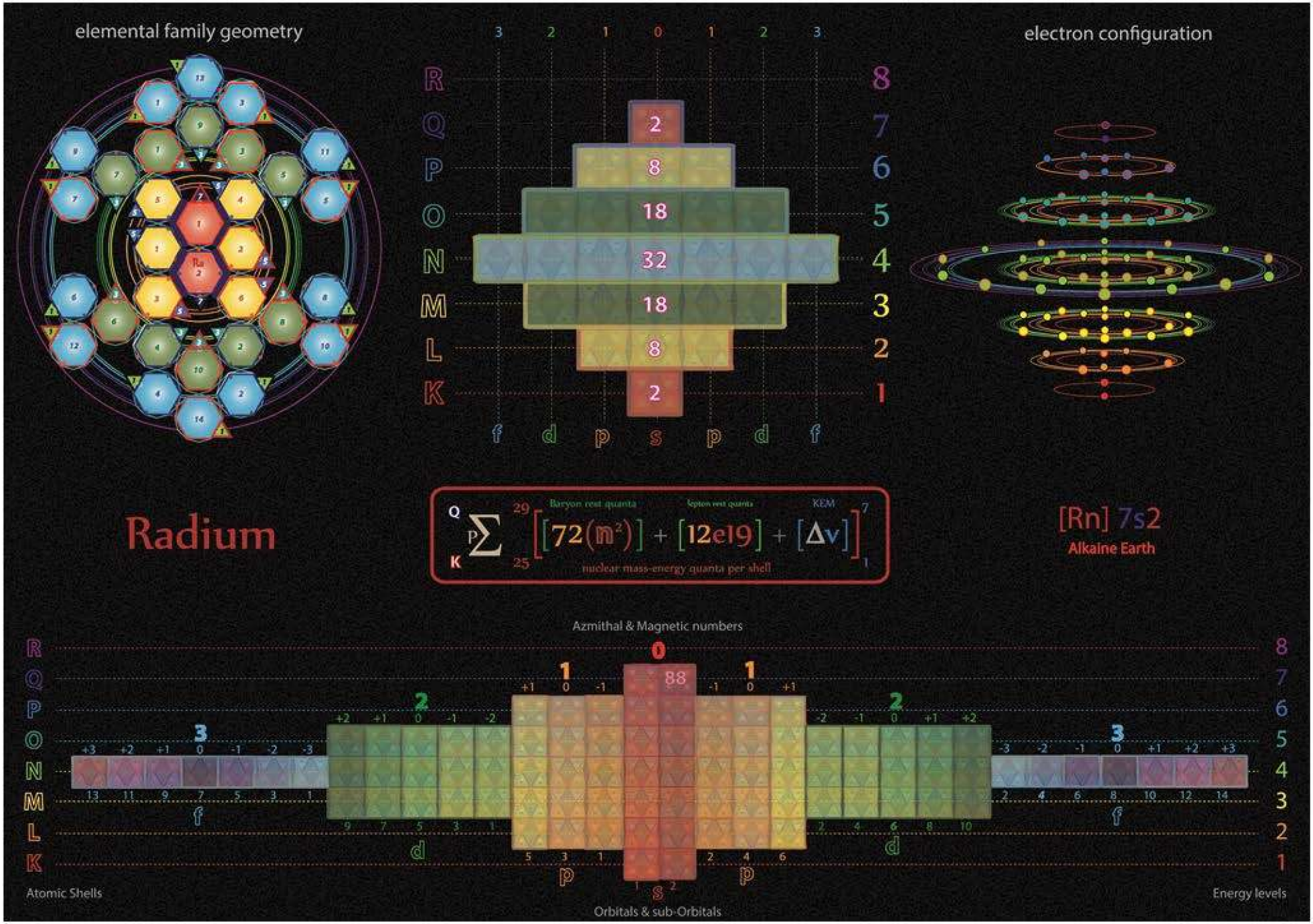

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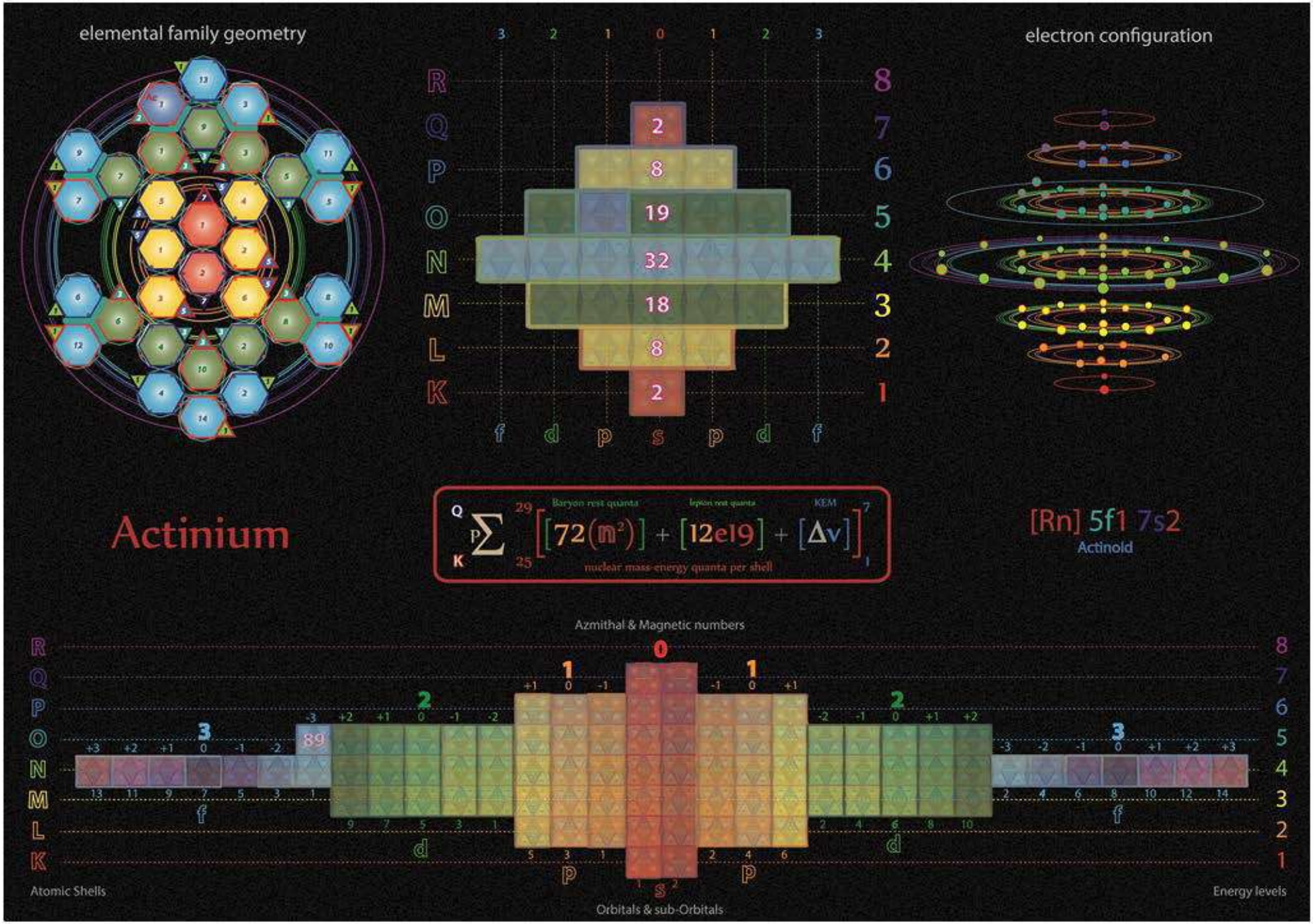

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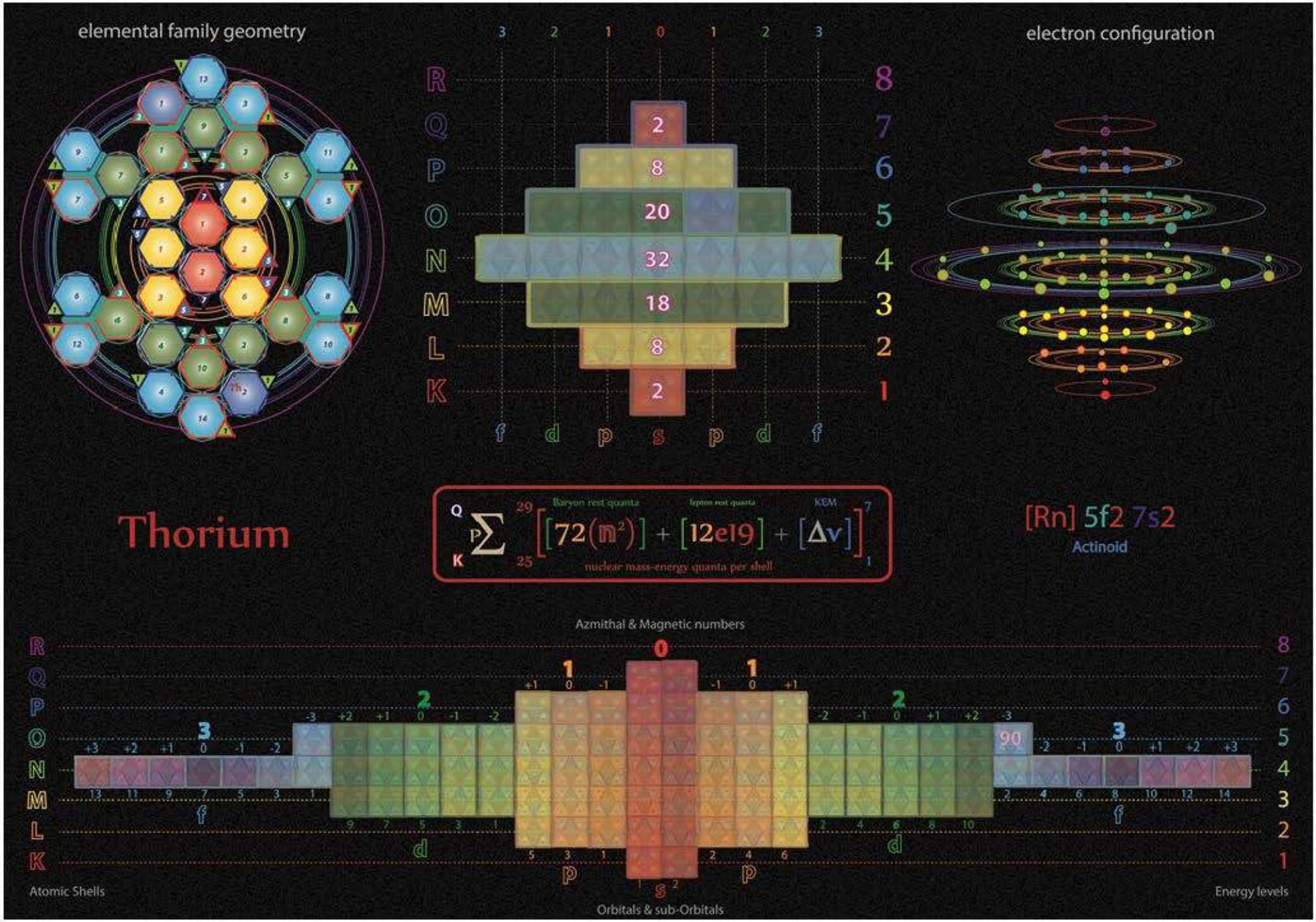

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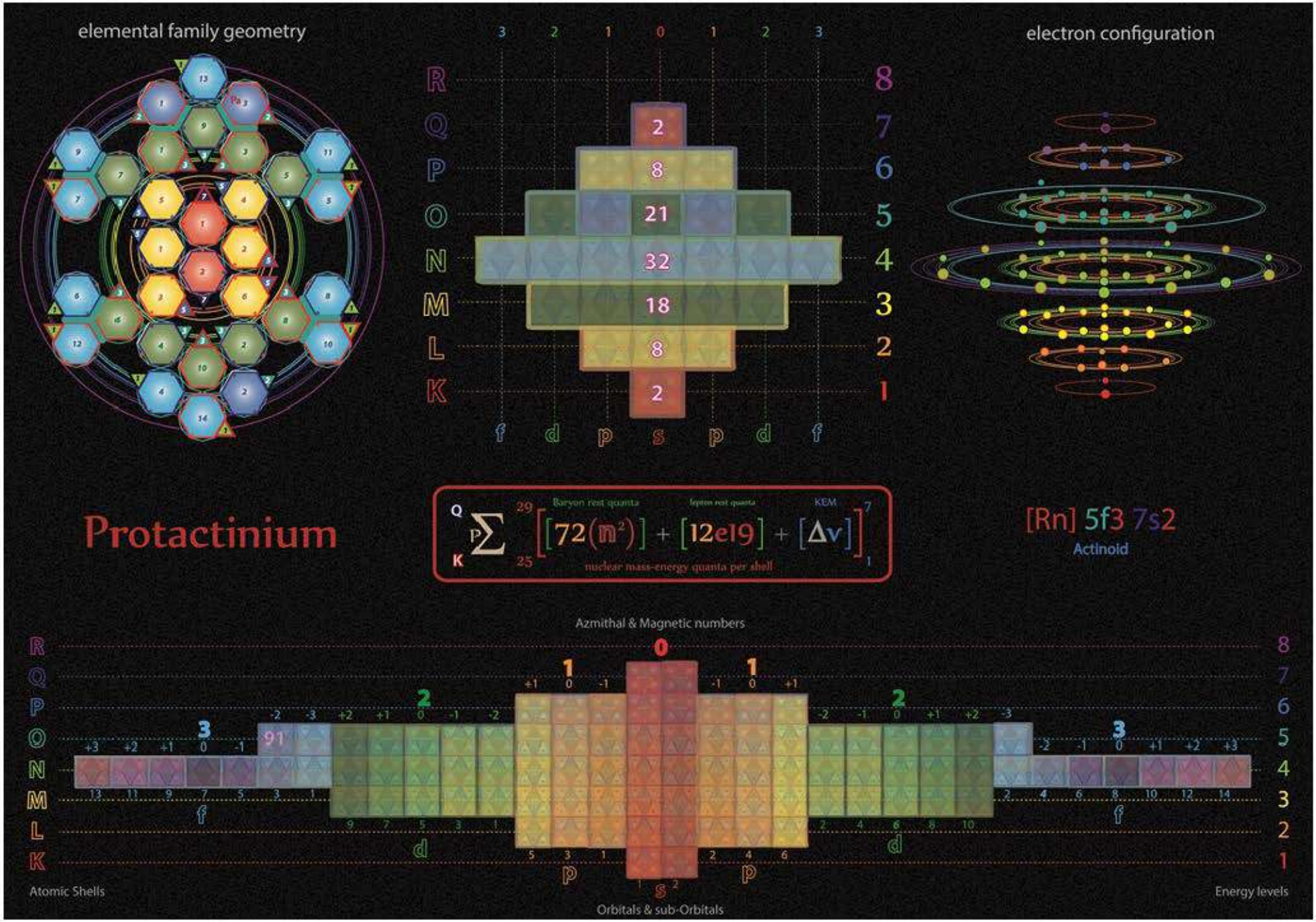

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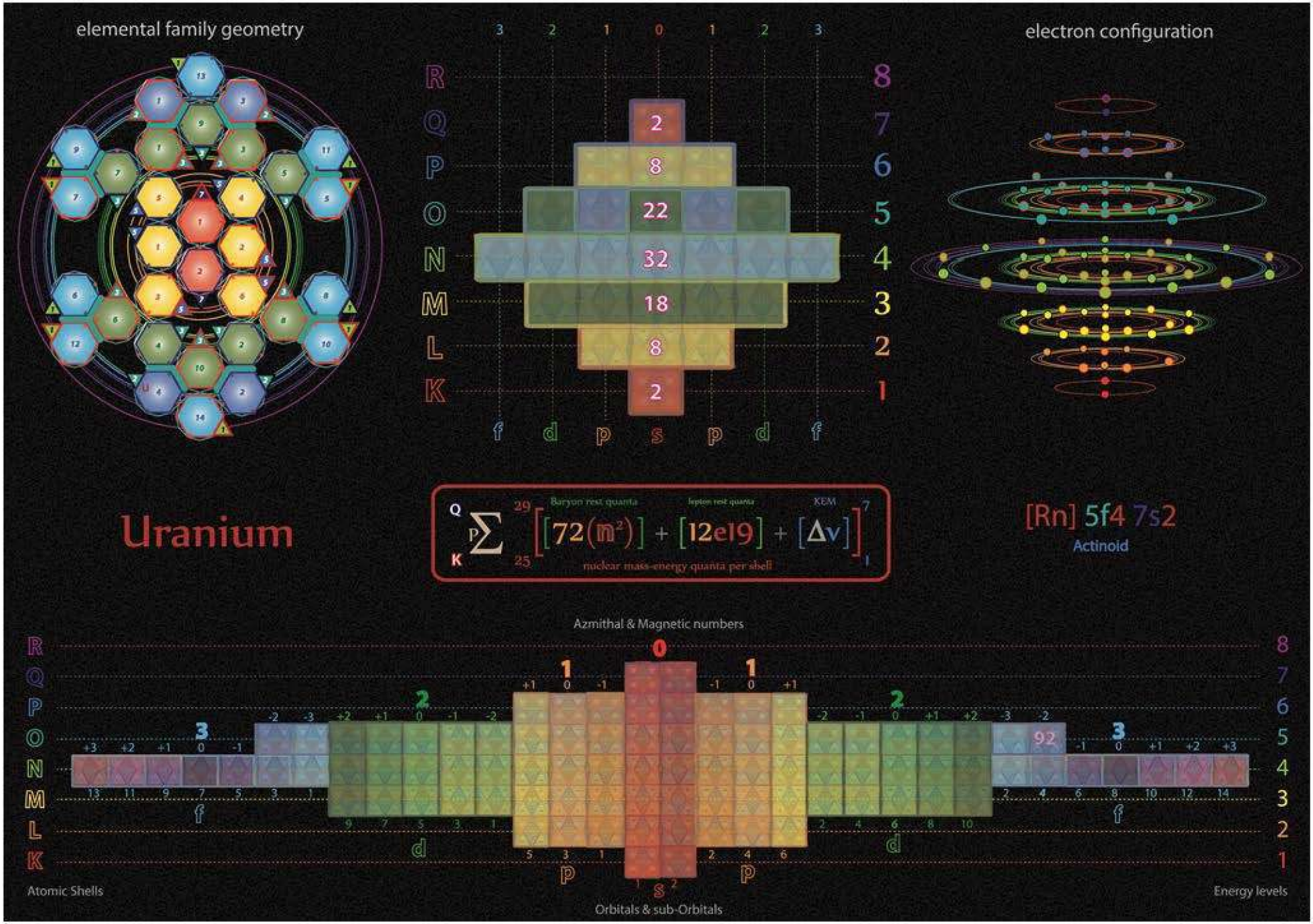

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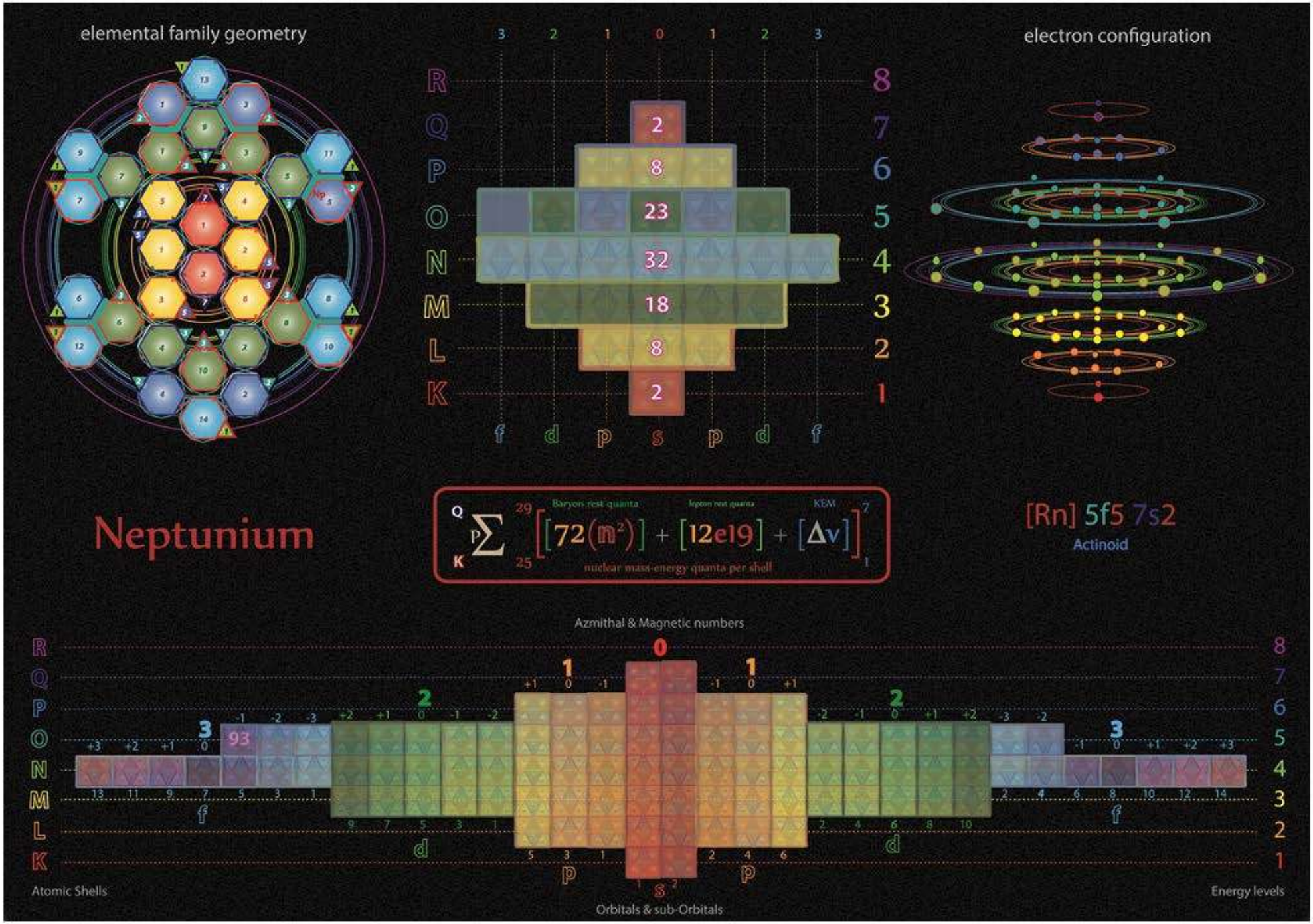

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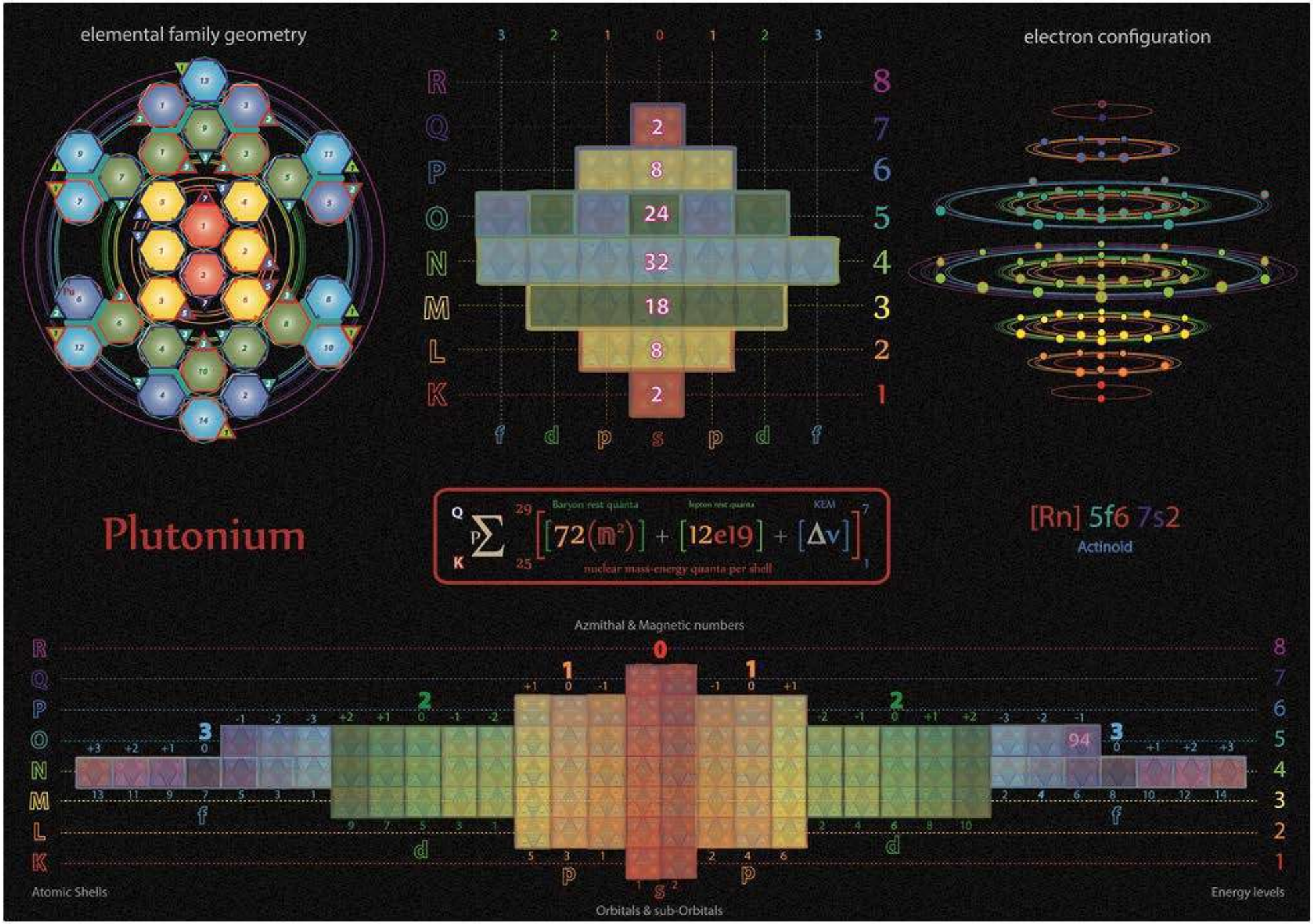

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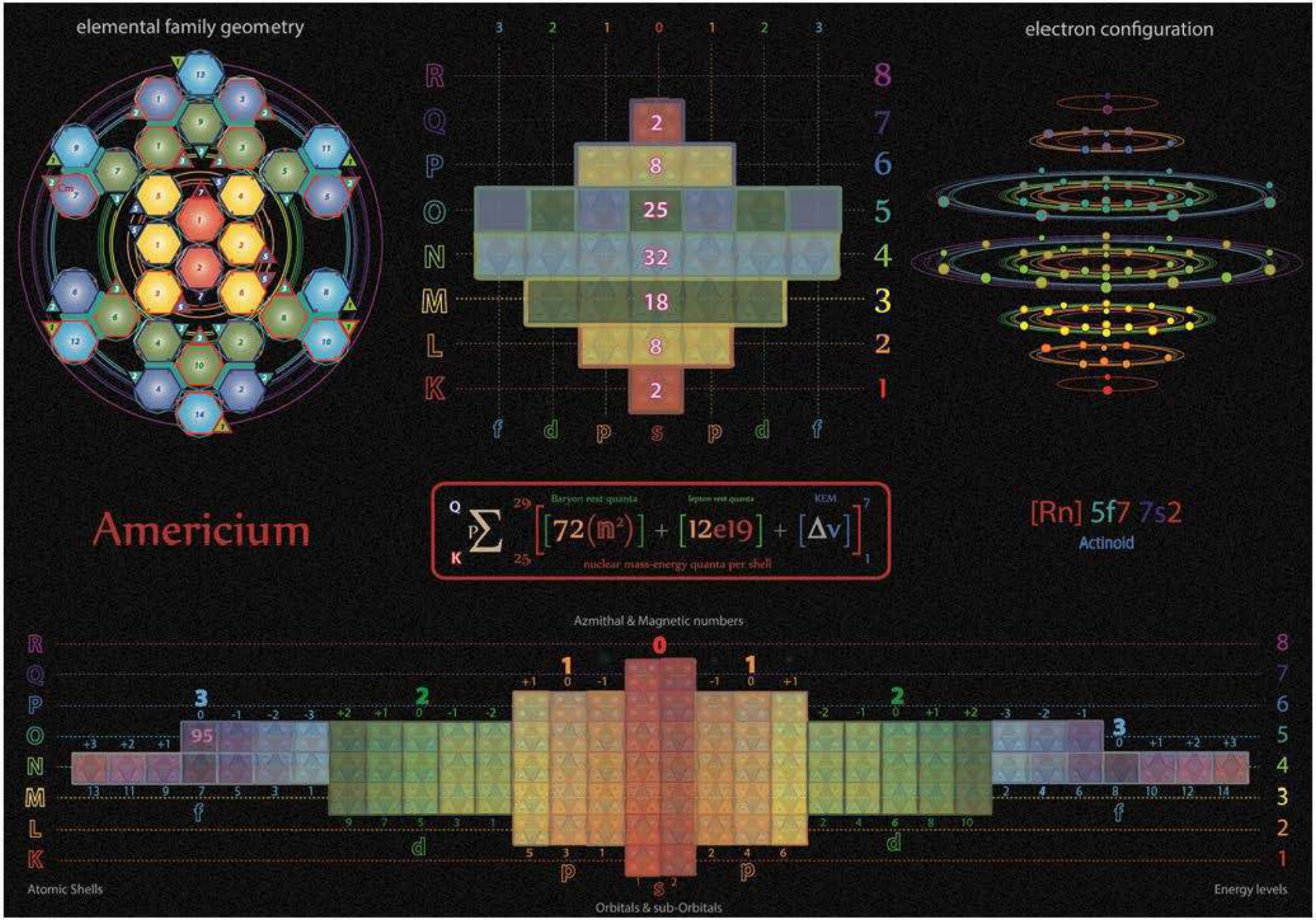

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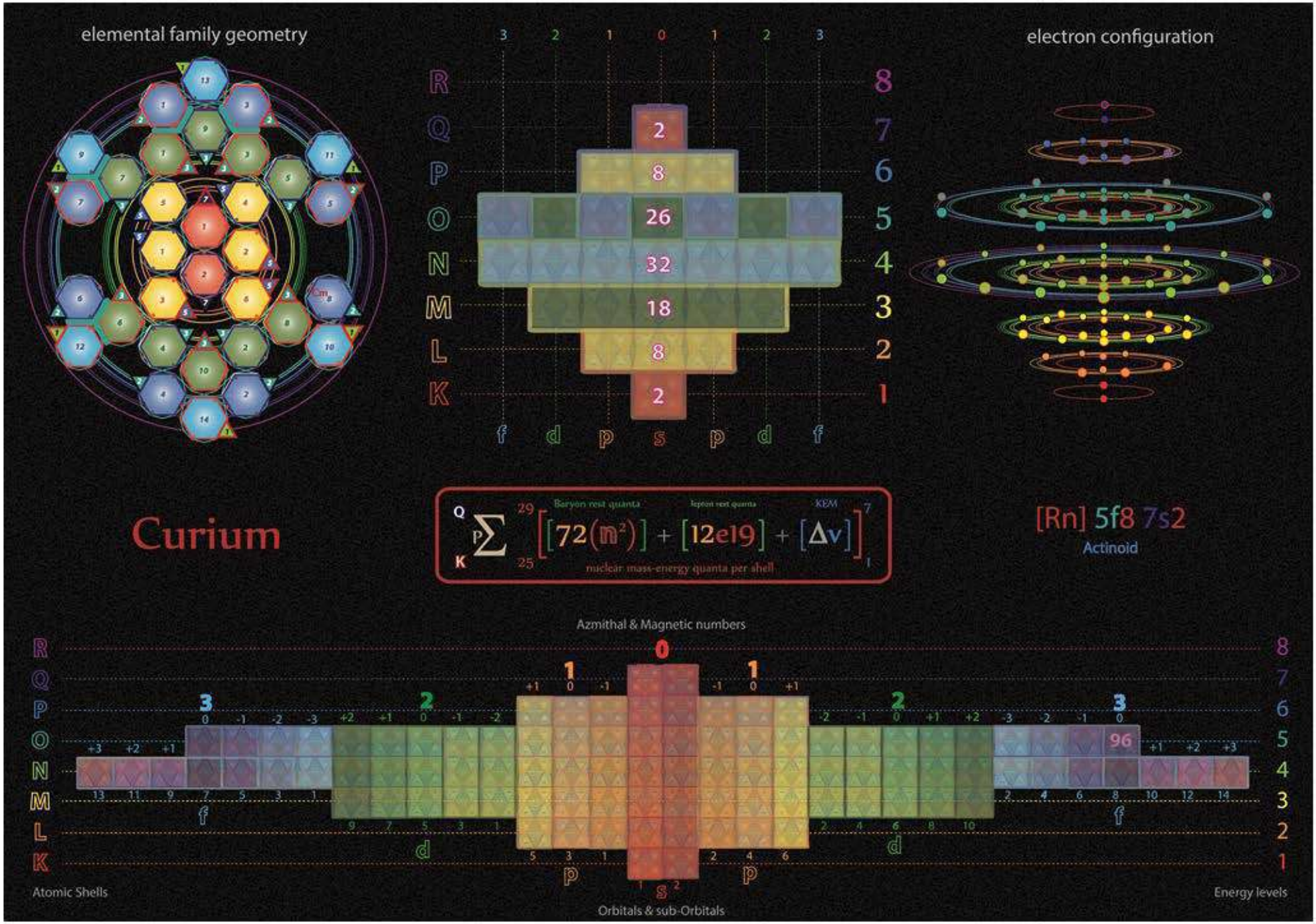

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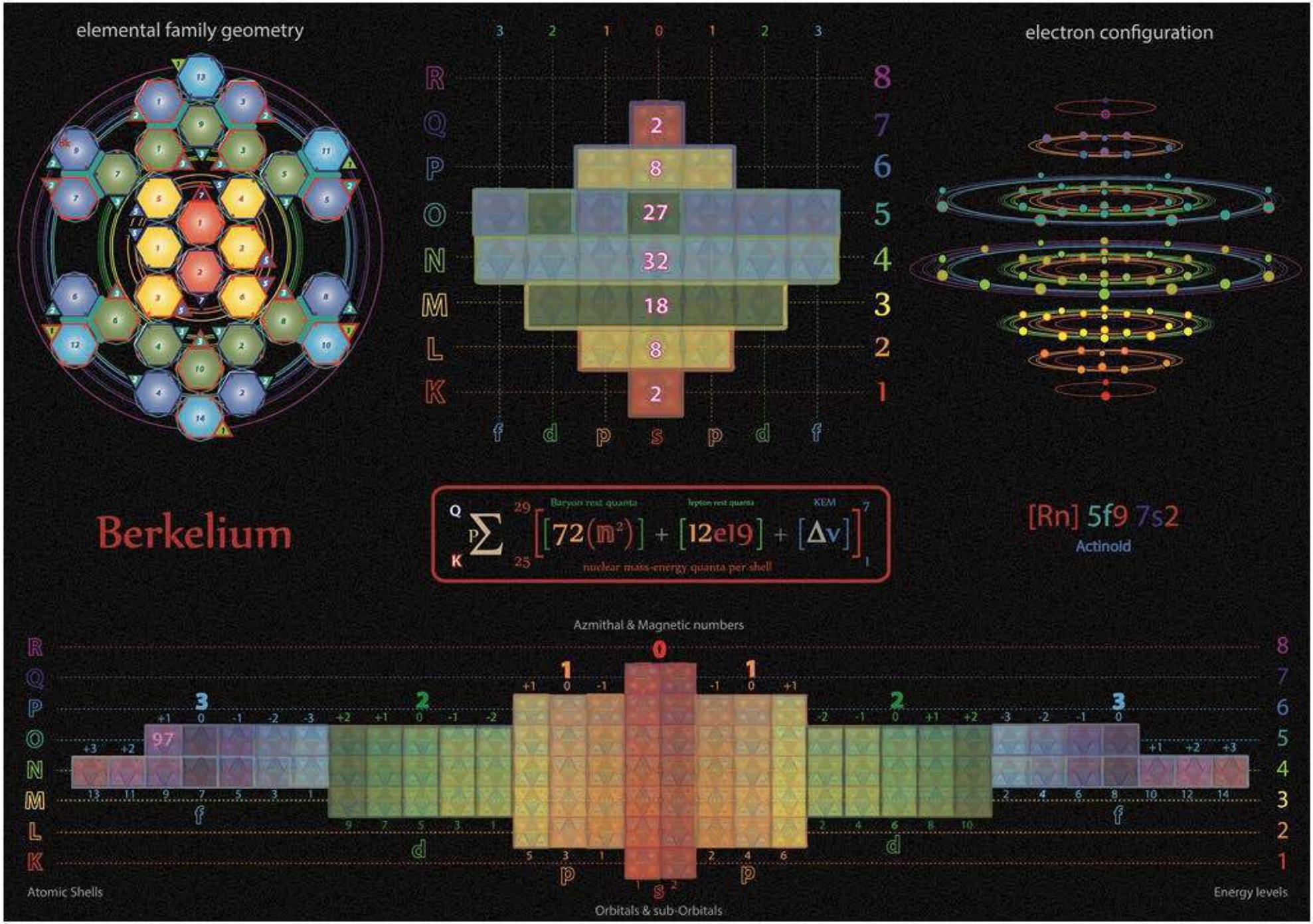

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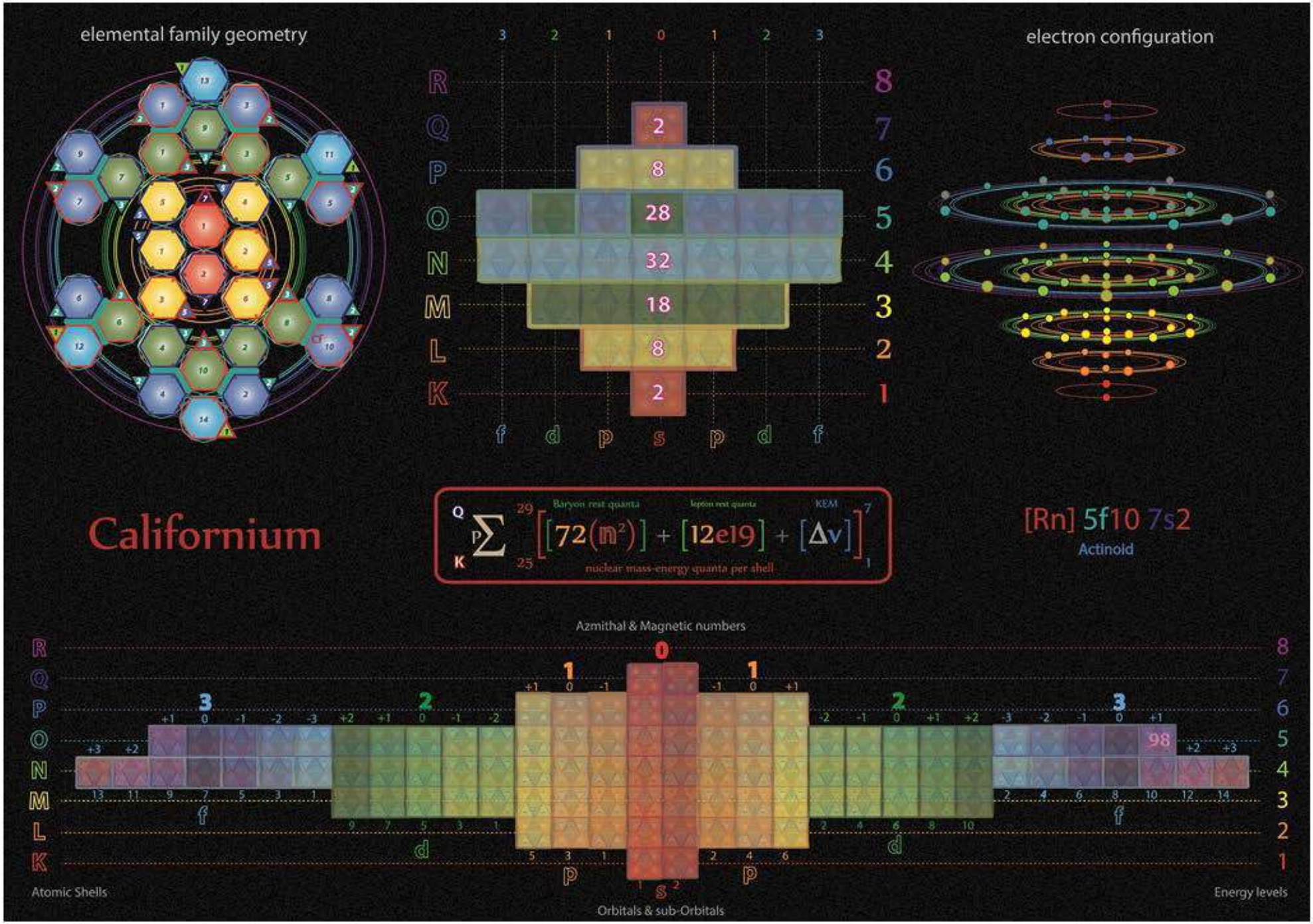

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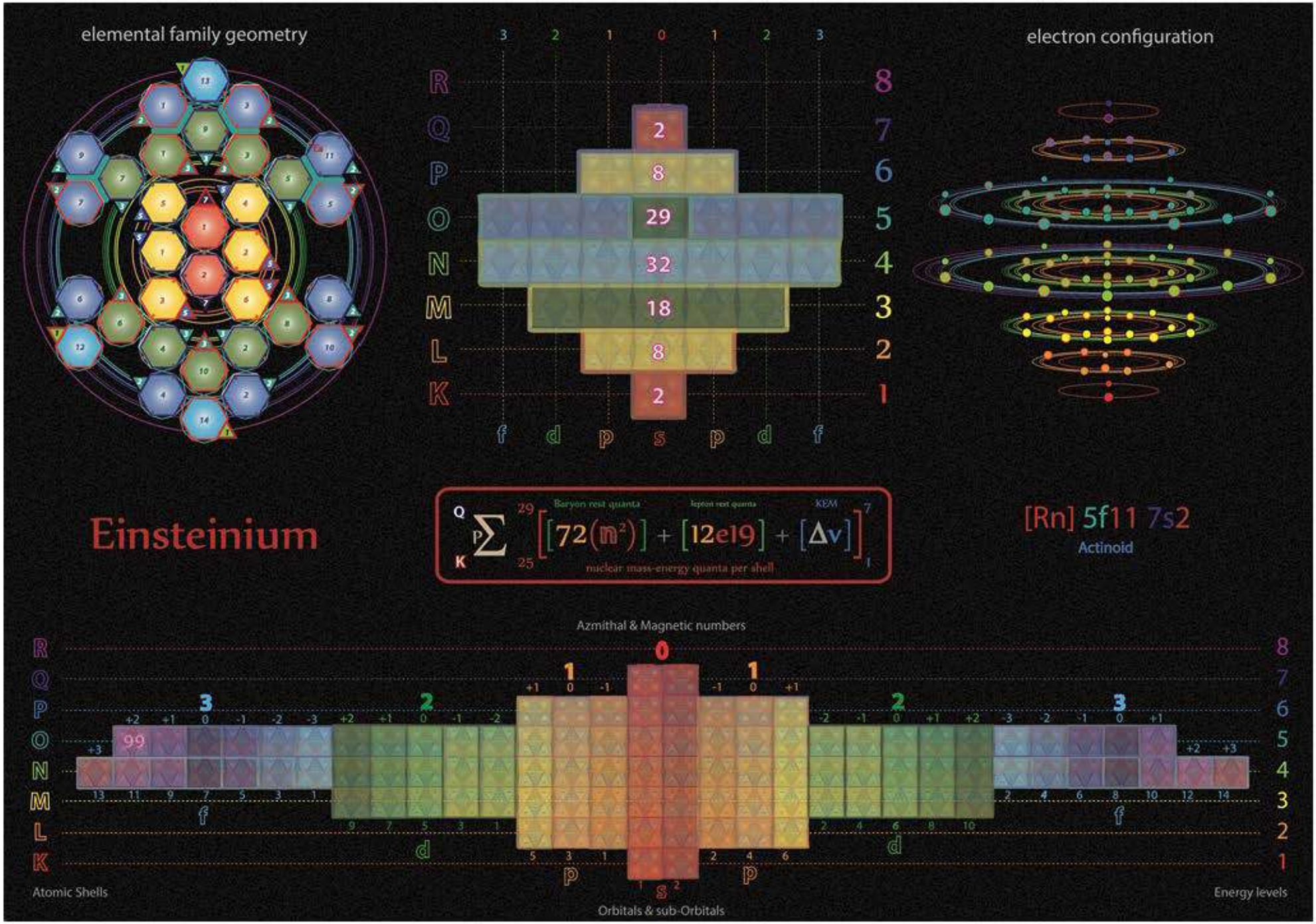

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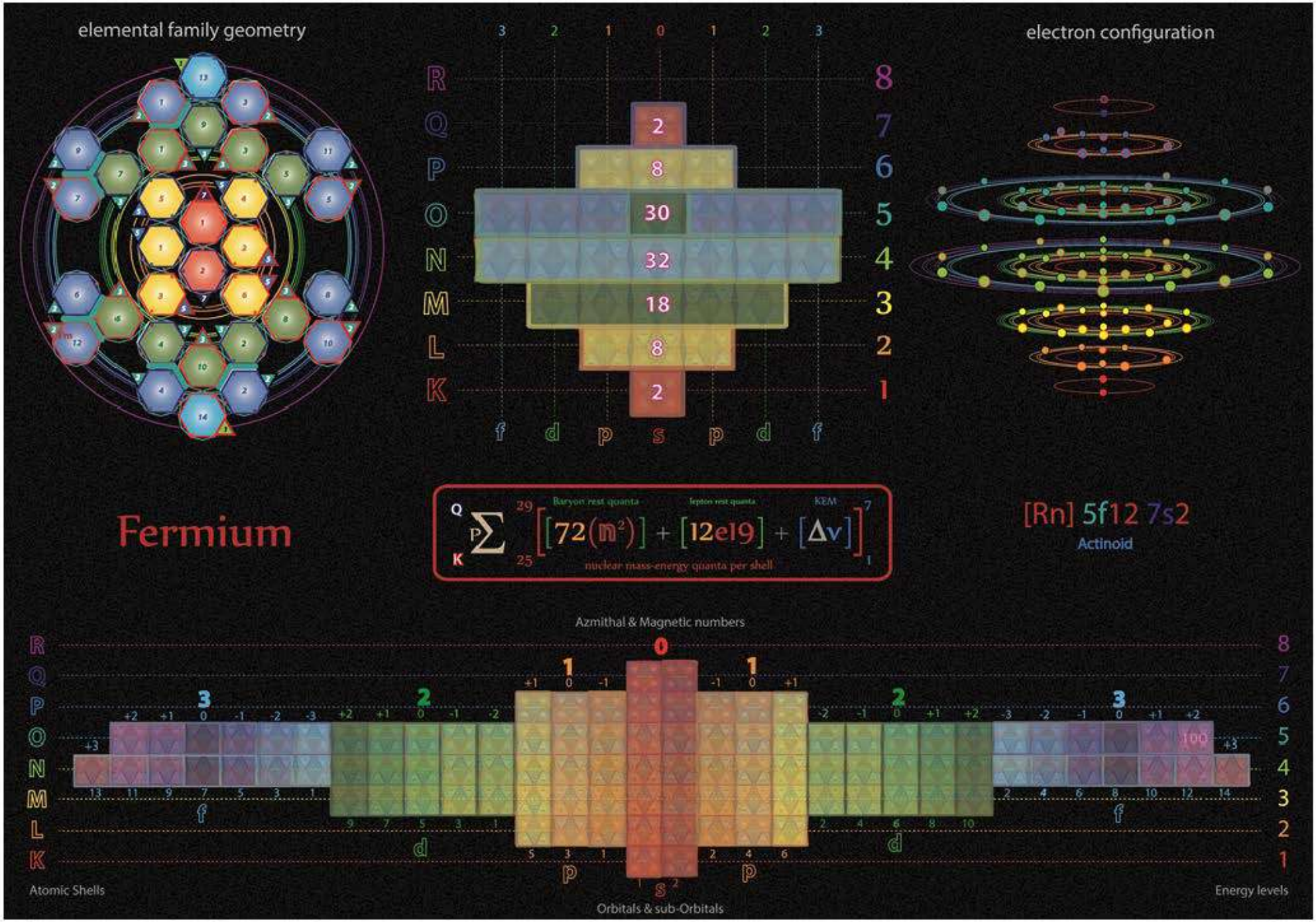

Tetryonics 53.100 - Fermium atomic config

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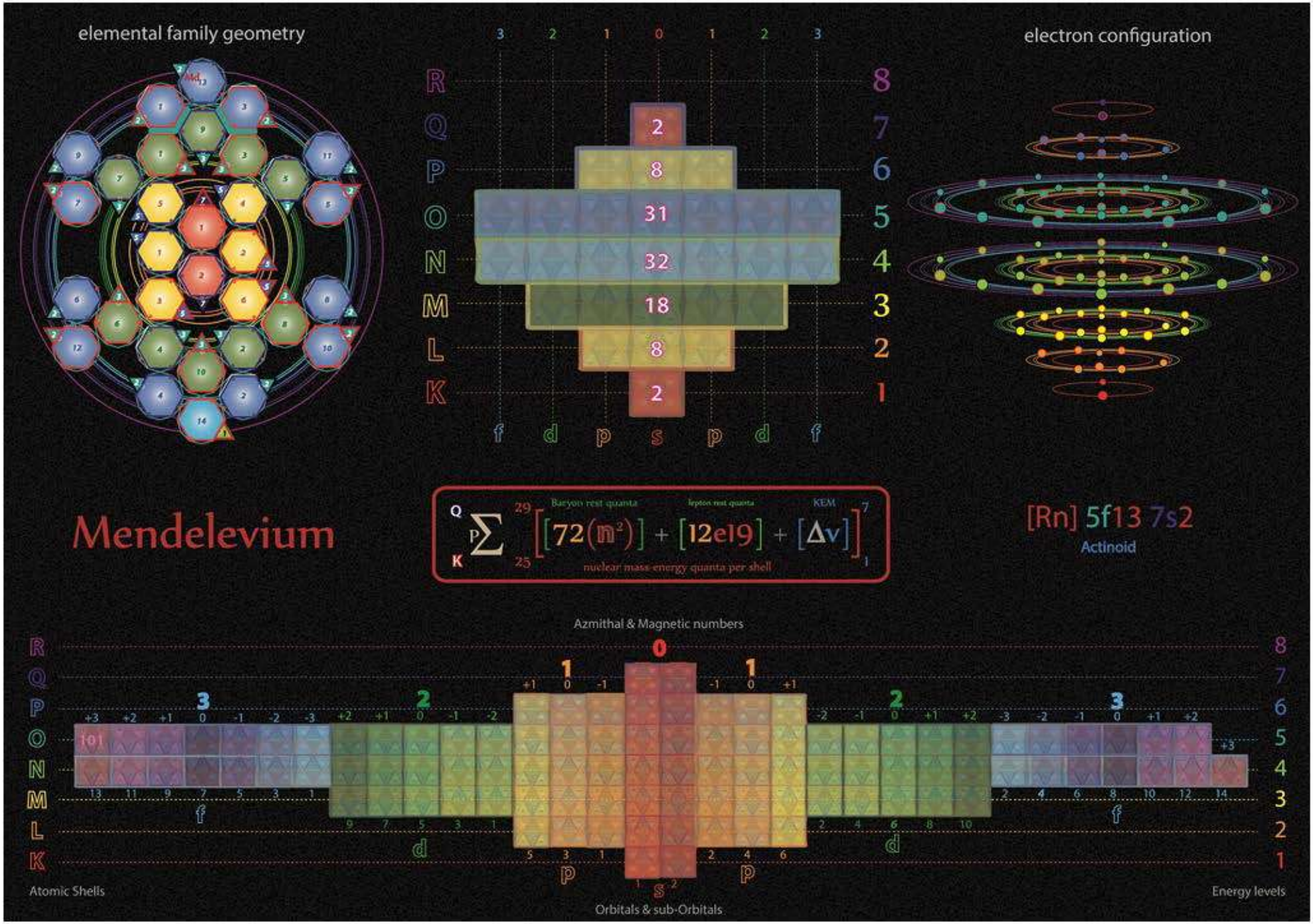

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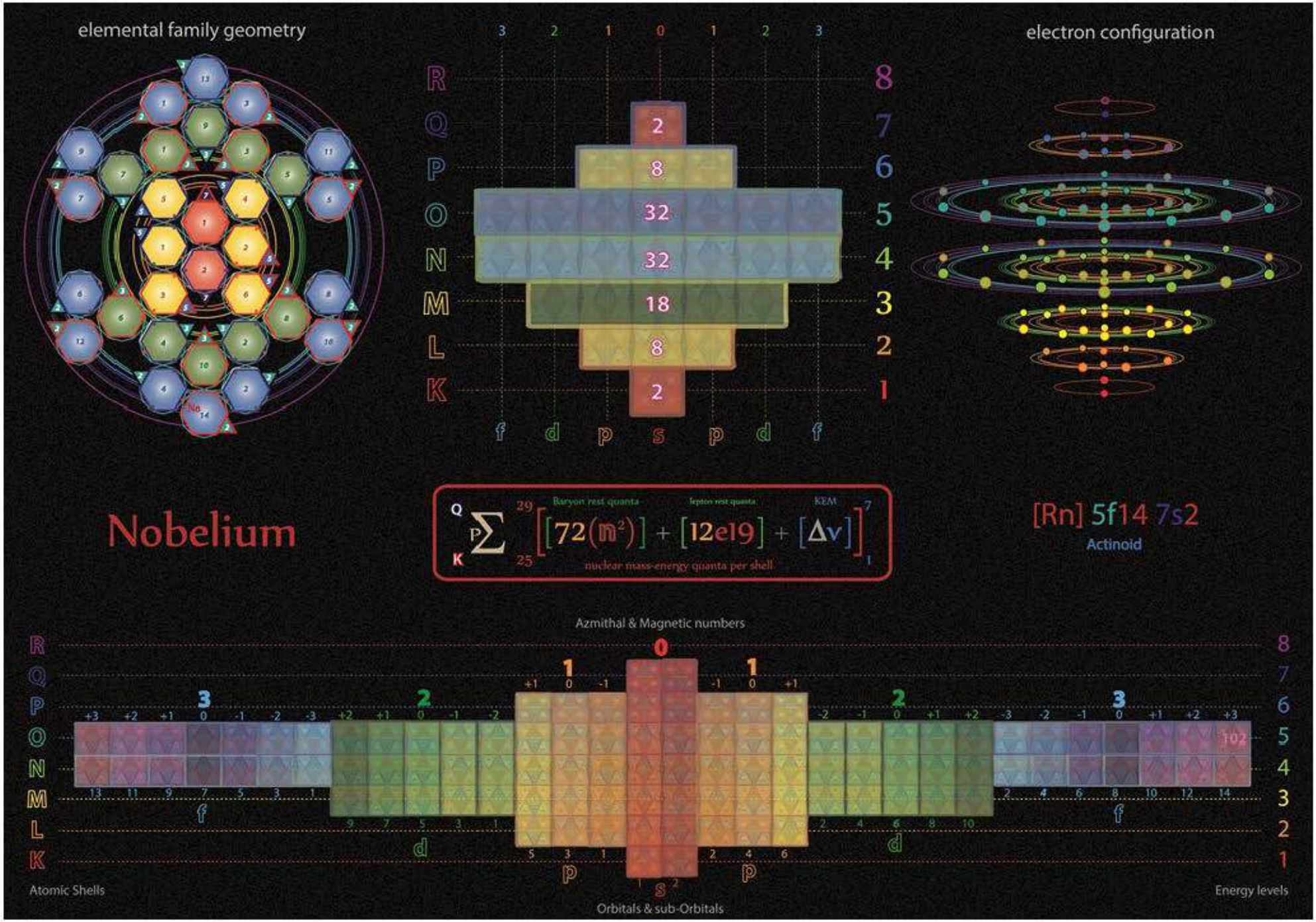

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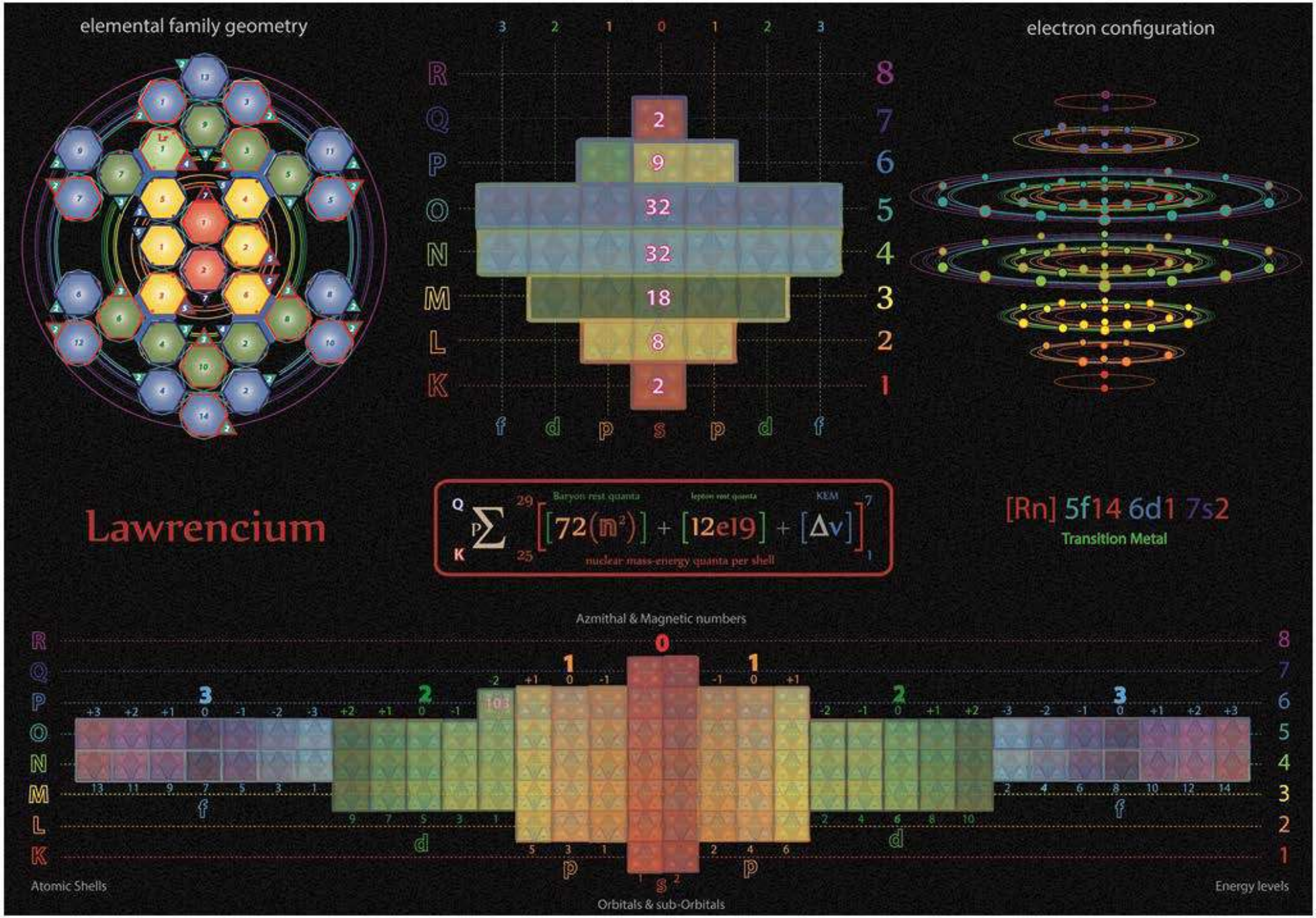

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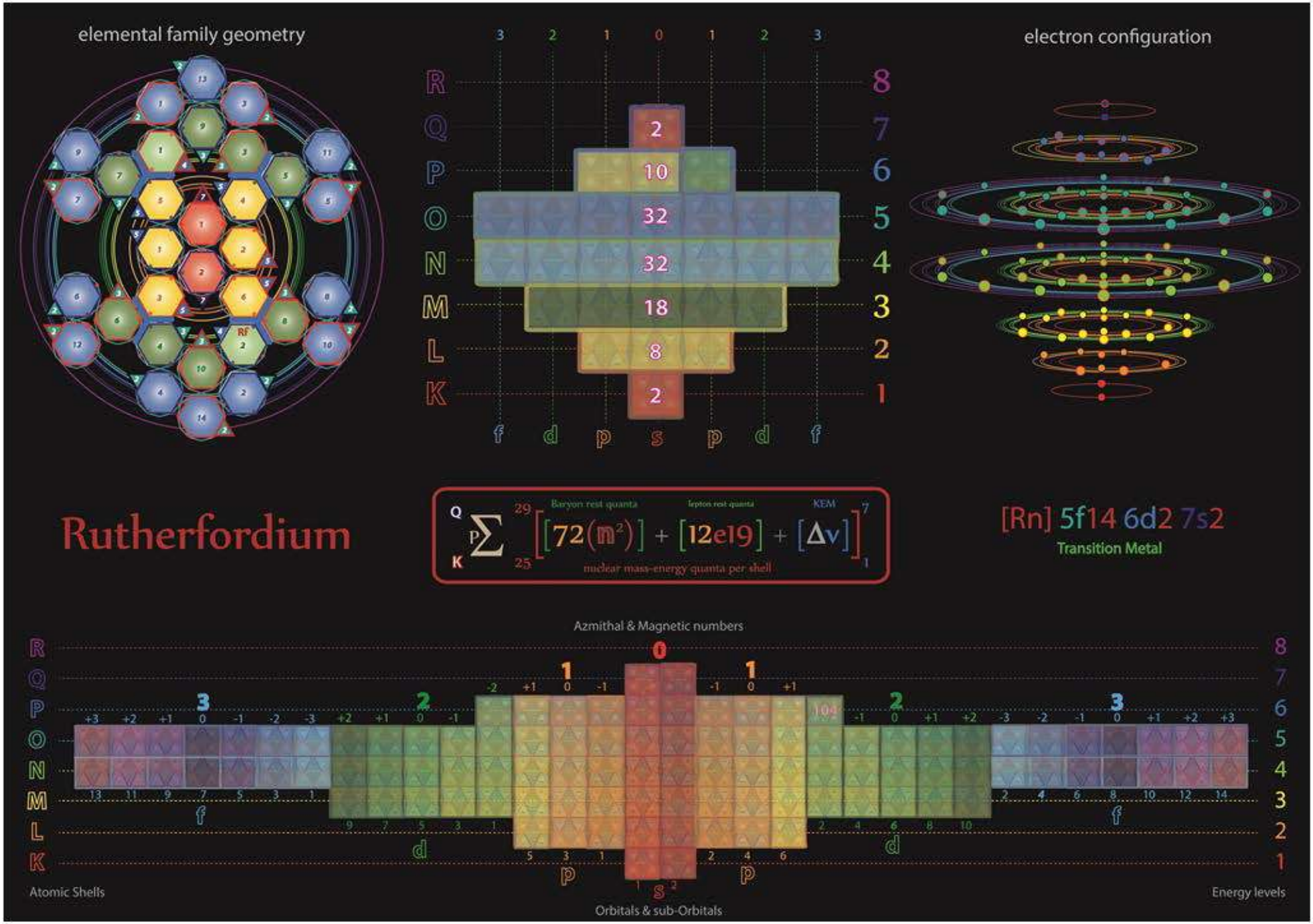

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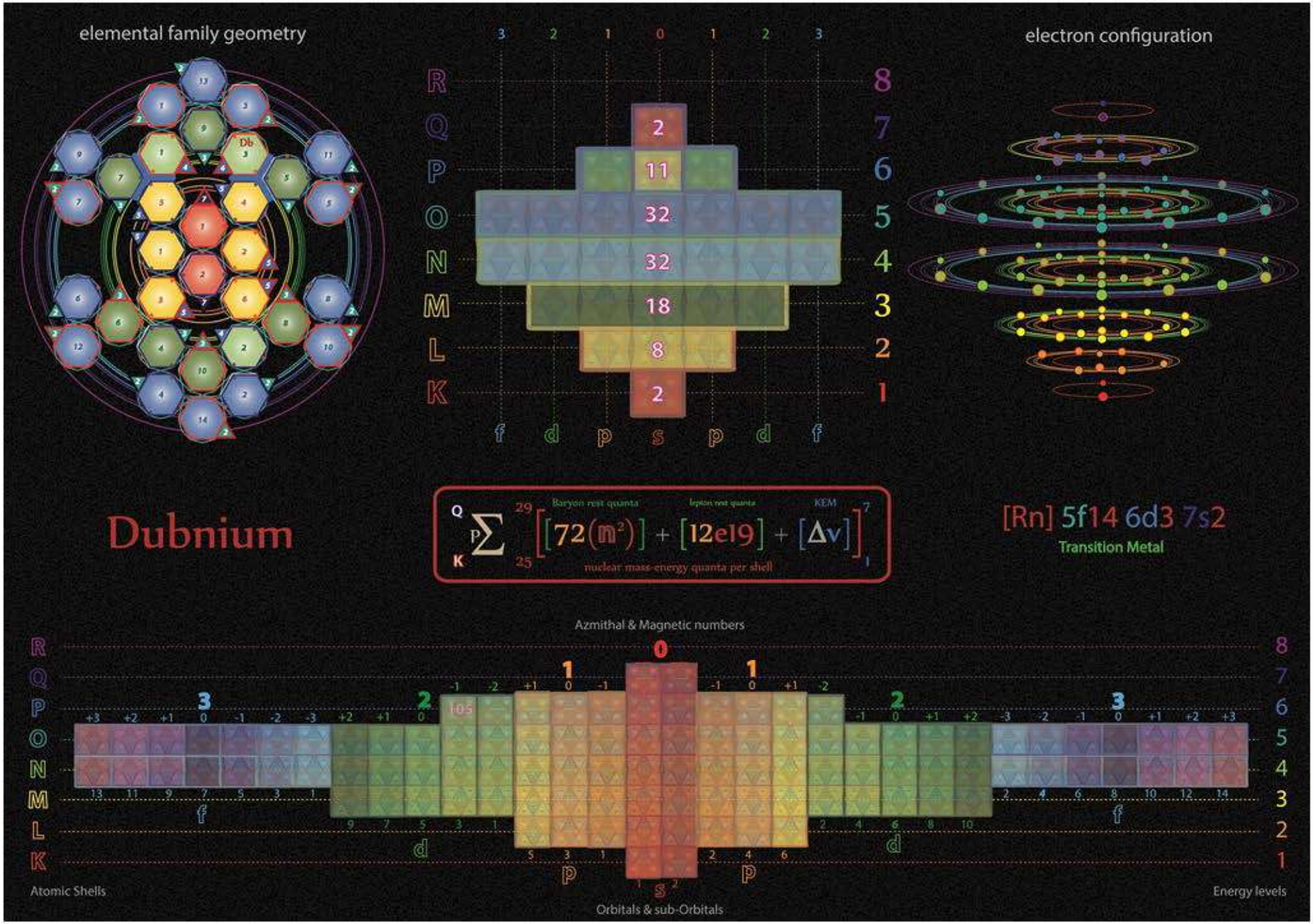

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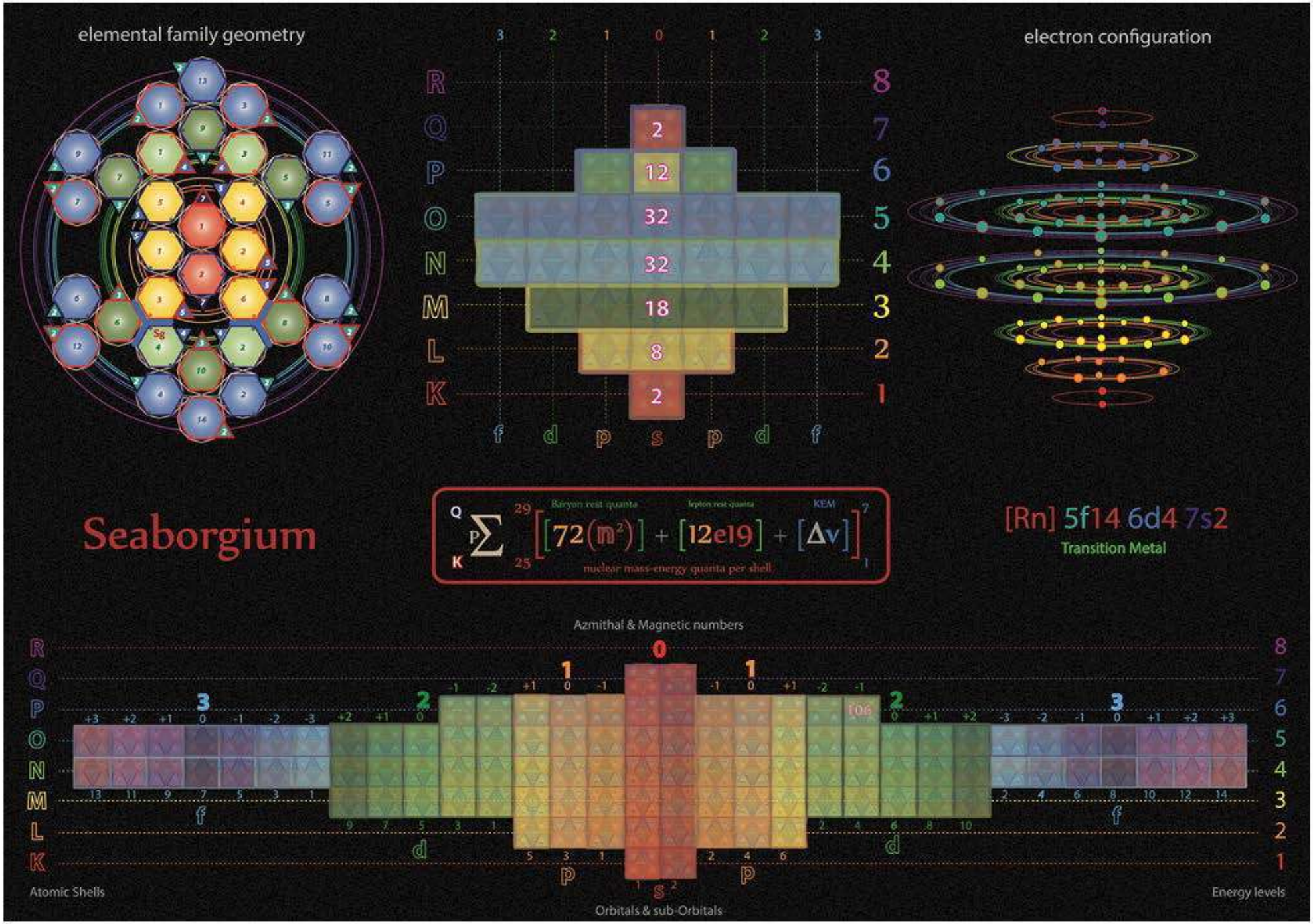

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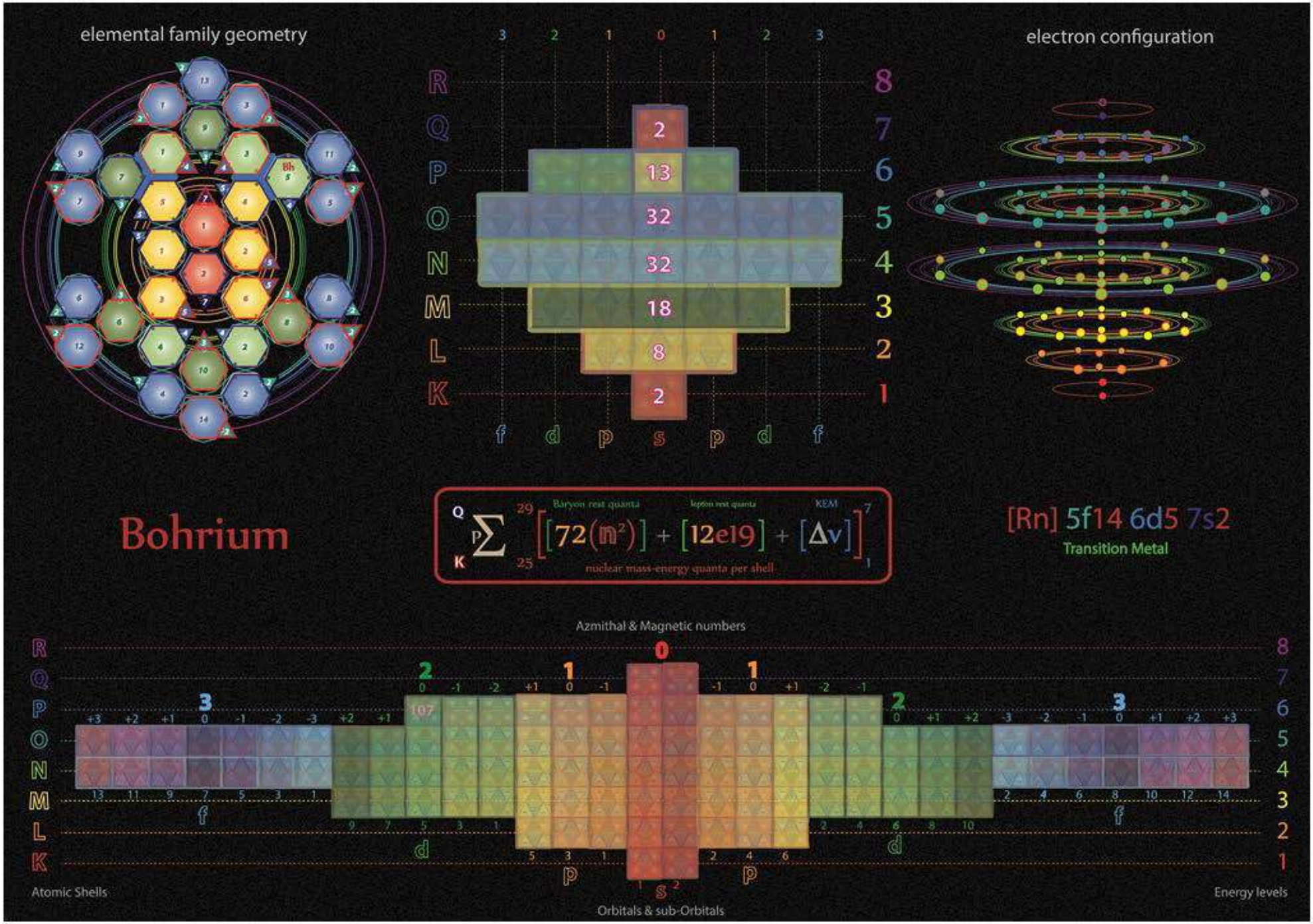
elemental family geometry
electron configuration
R Q P O N M L K
8 7 6 5 4 3 2 1
2 13 32 32 18 8 2
3 2 1 0 1 2 3
f d p s p d f
Bohrium
Baryon rest quanta
lepton rest quanta
KEM
nuclear mass-energy quanta per shell
[Rn] 5f14 6d5 7s2
Transition Metal
Azmithal & Magnetic numbers
Atomic Shells
Orbitals & sub-Orbitals
Energy levels

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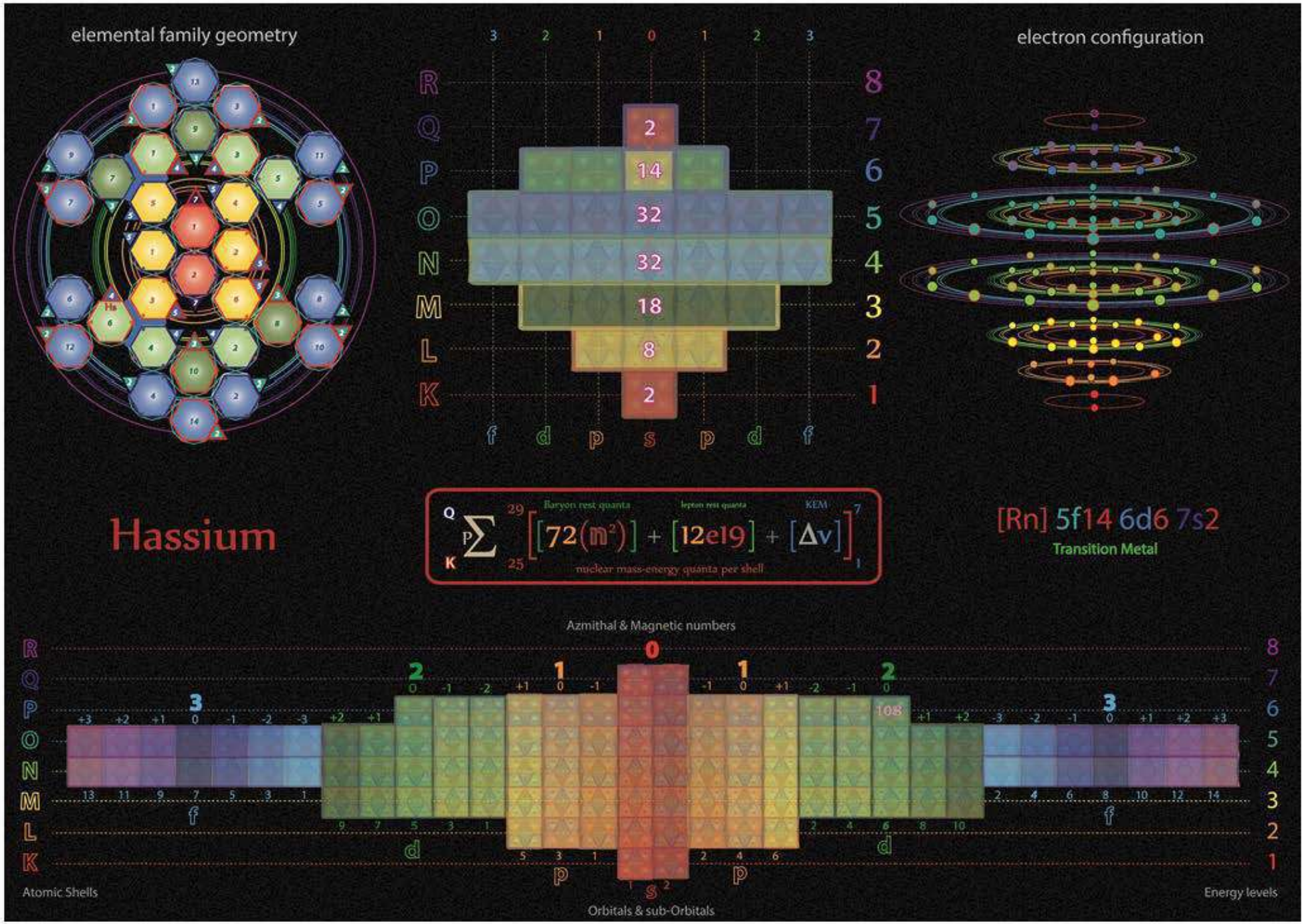

Tetryonics 53.108 - Hassium atomic config

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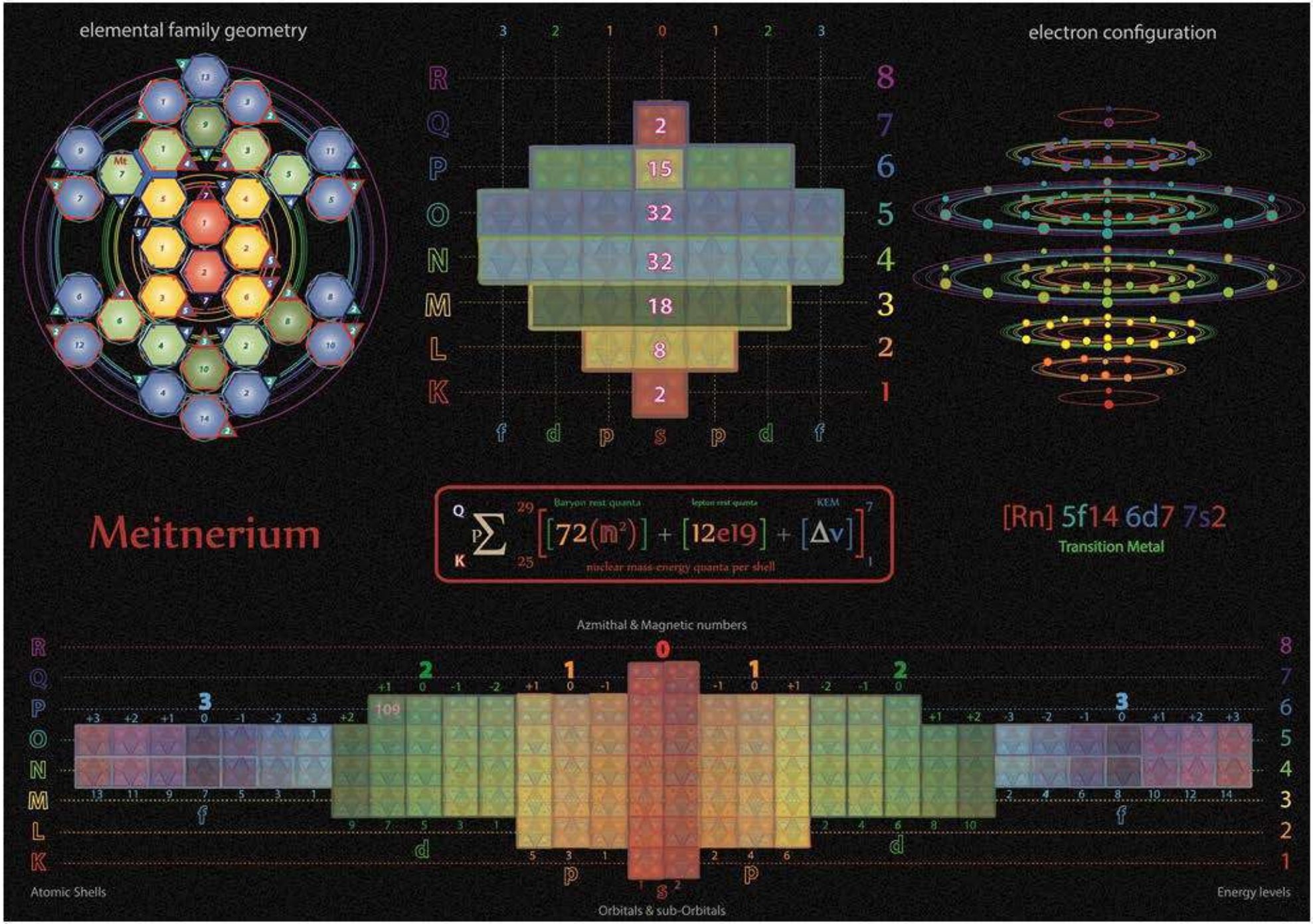

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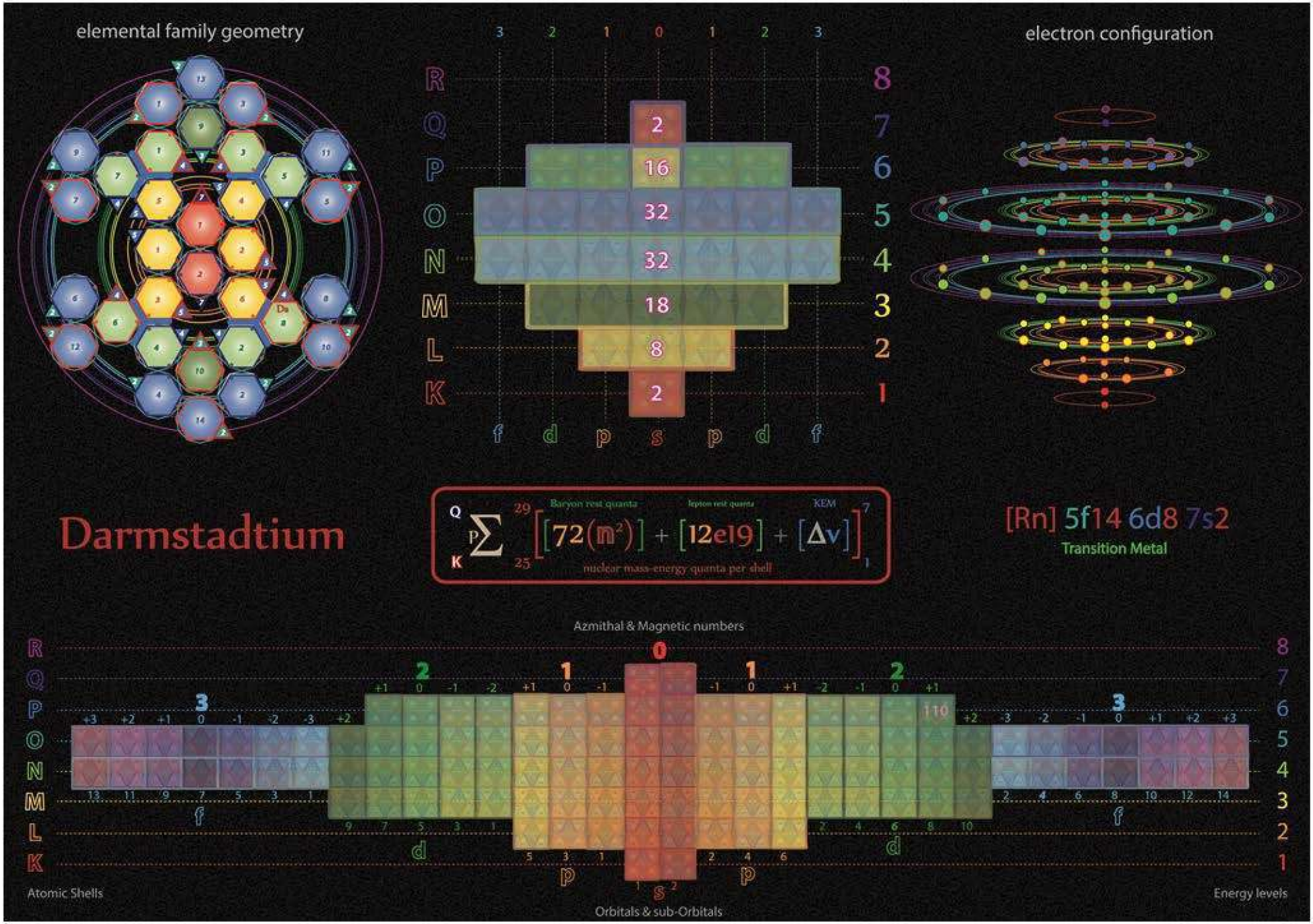

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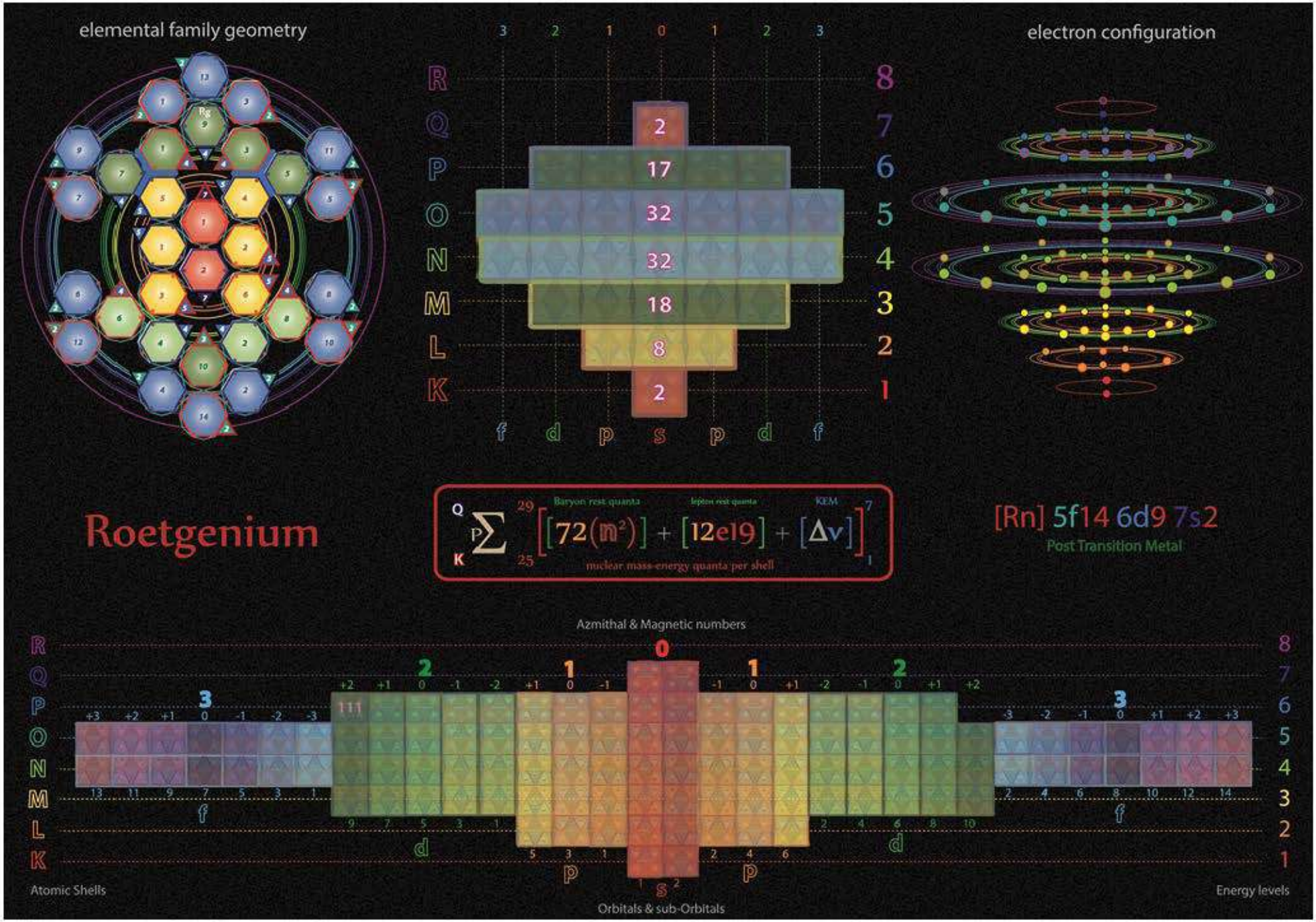

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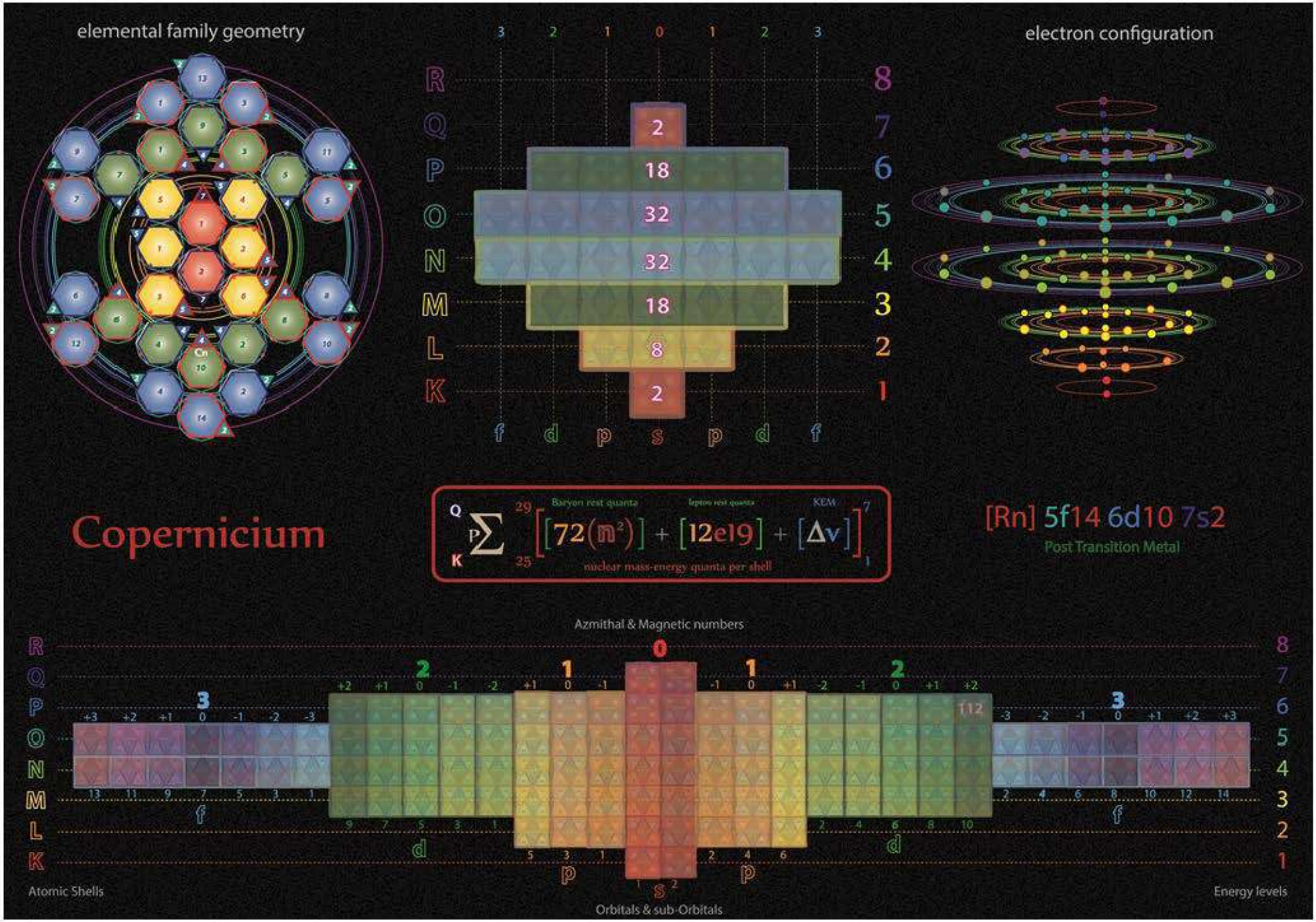

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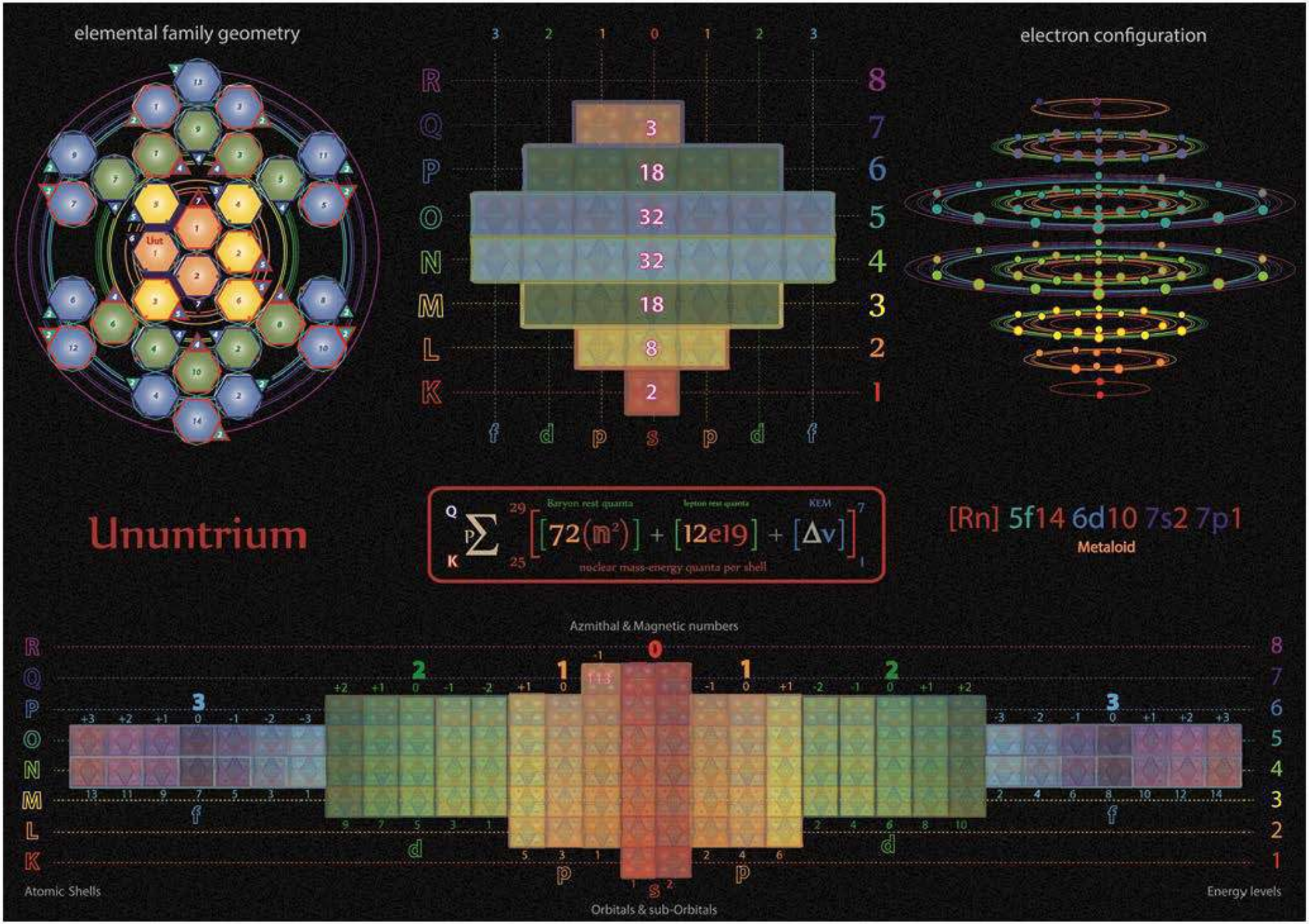

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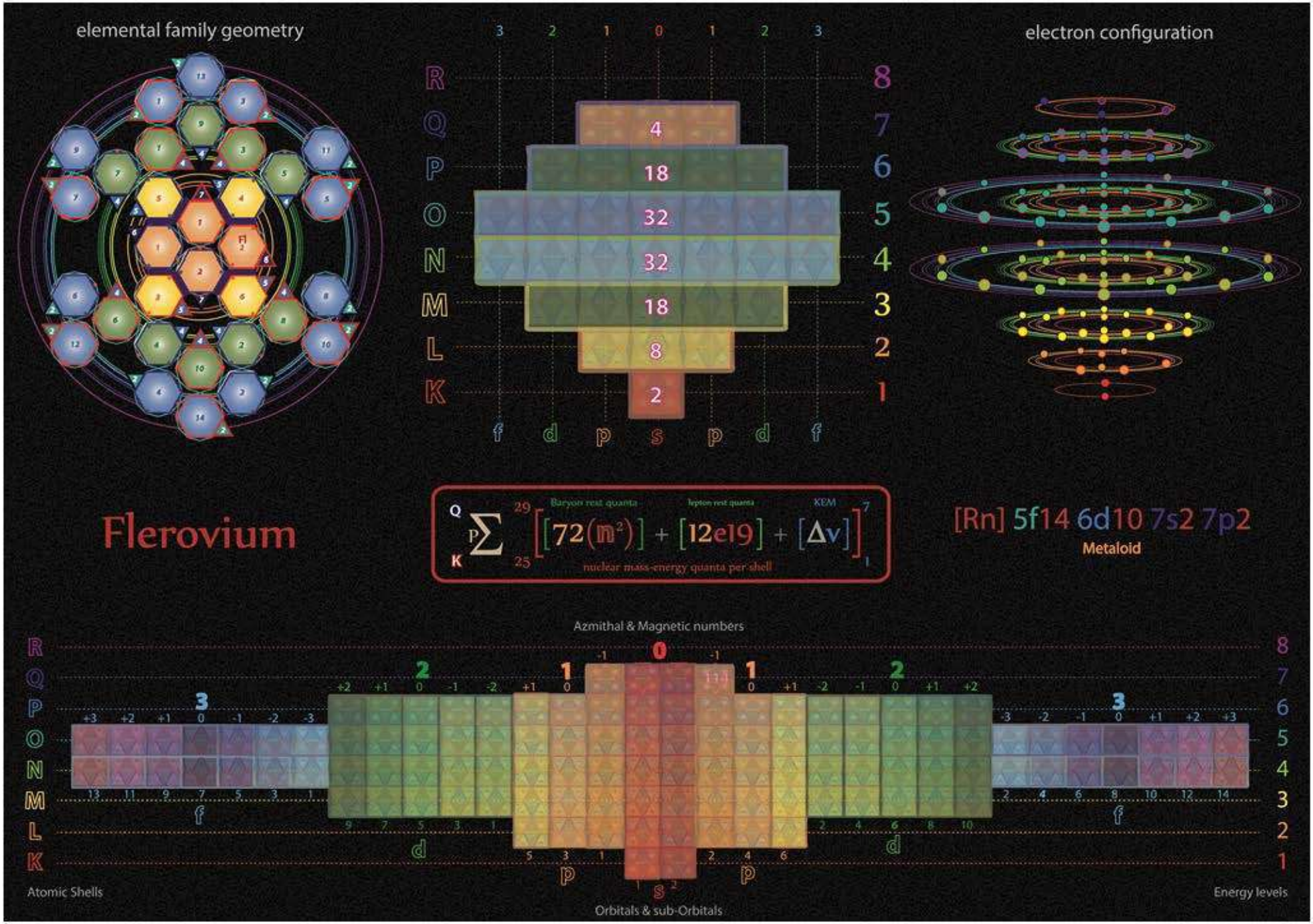

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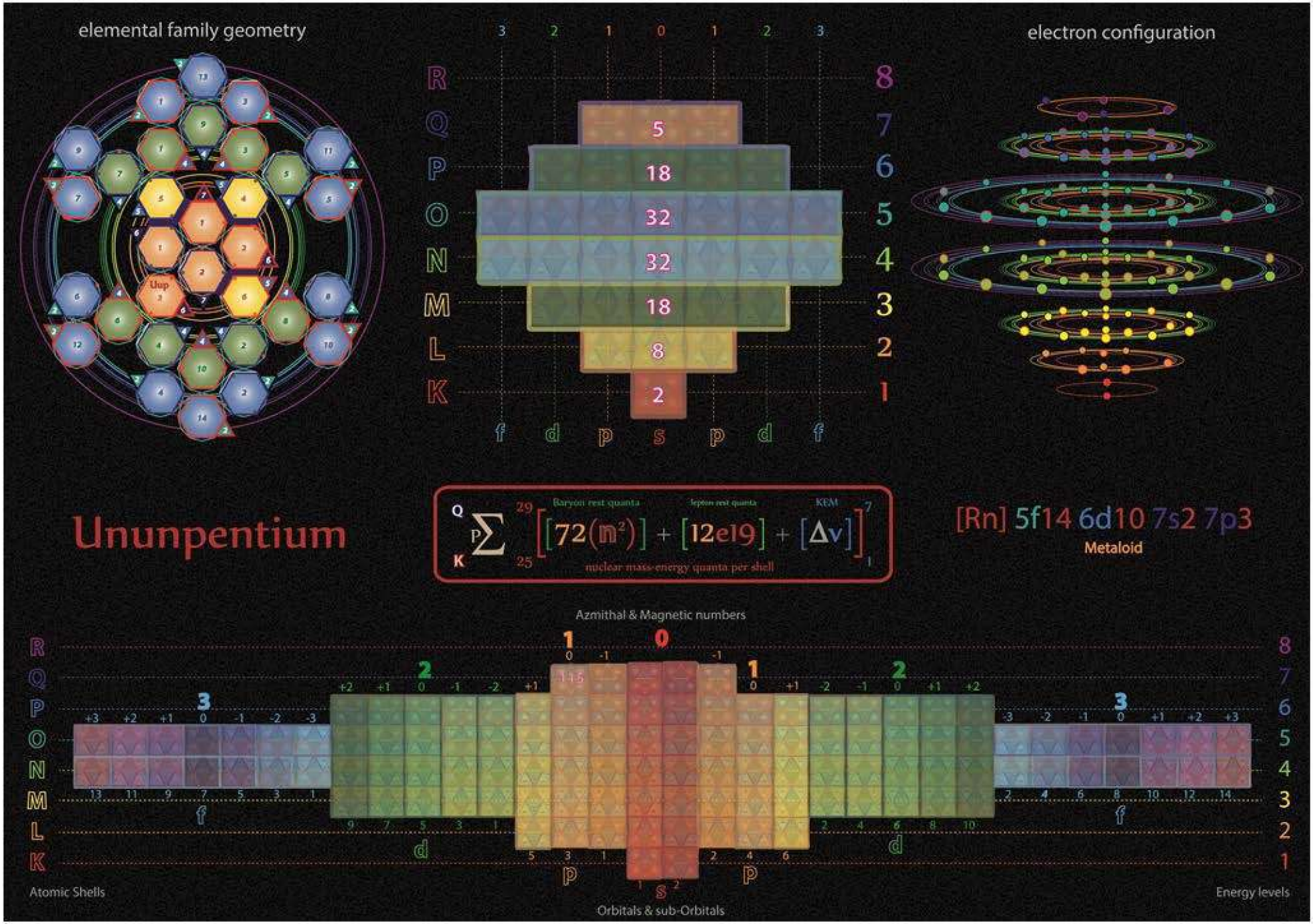

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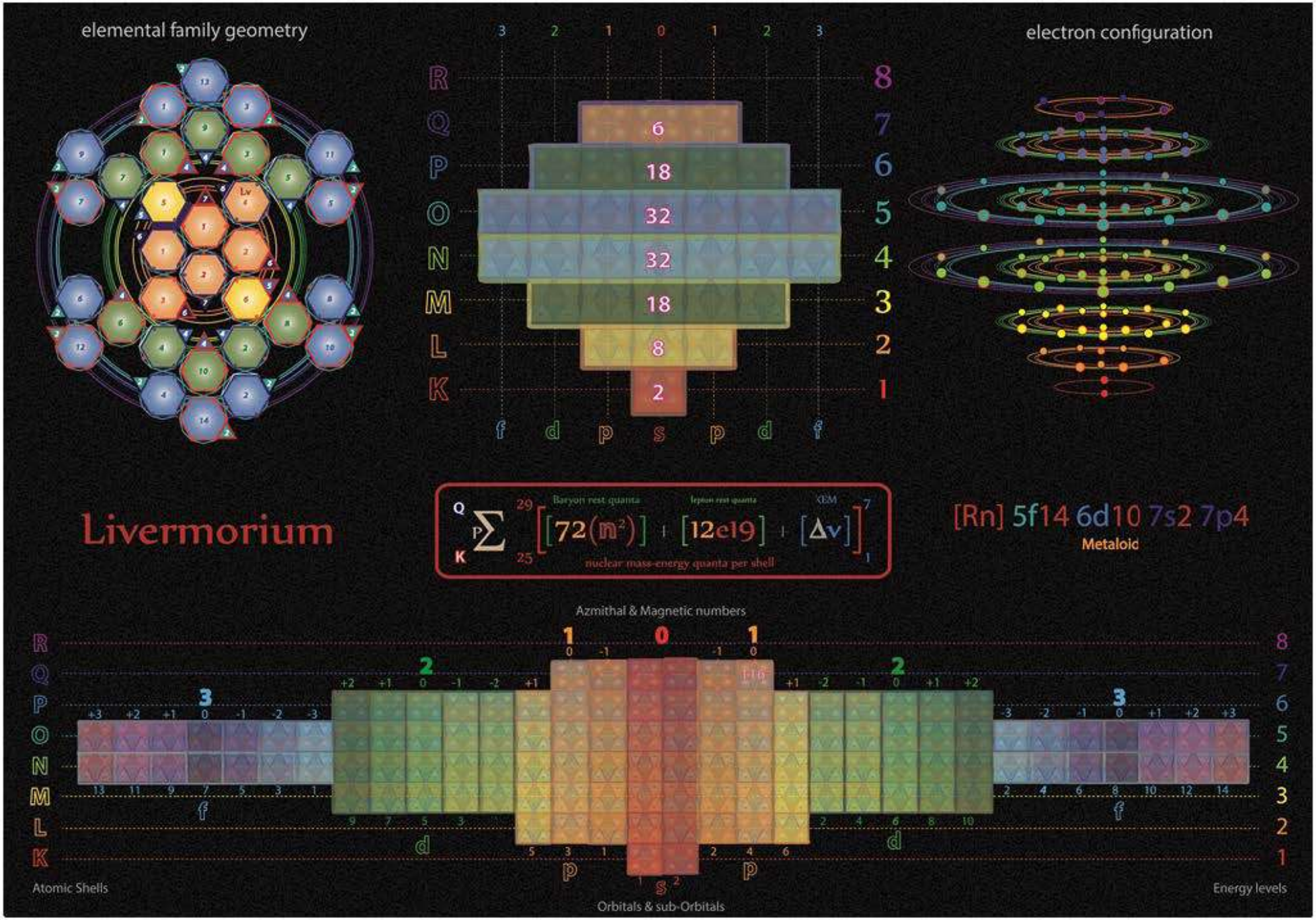

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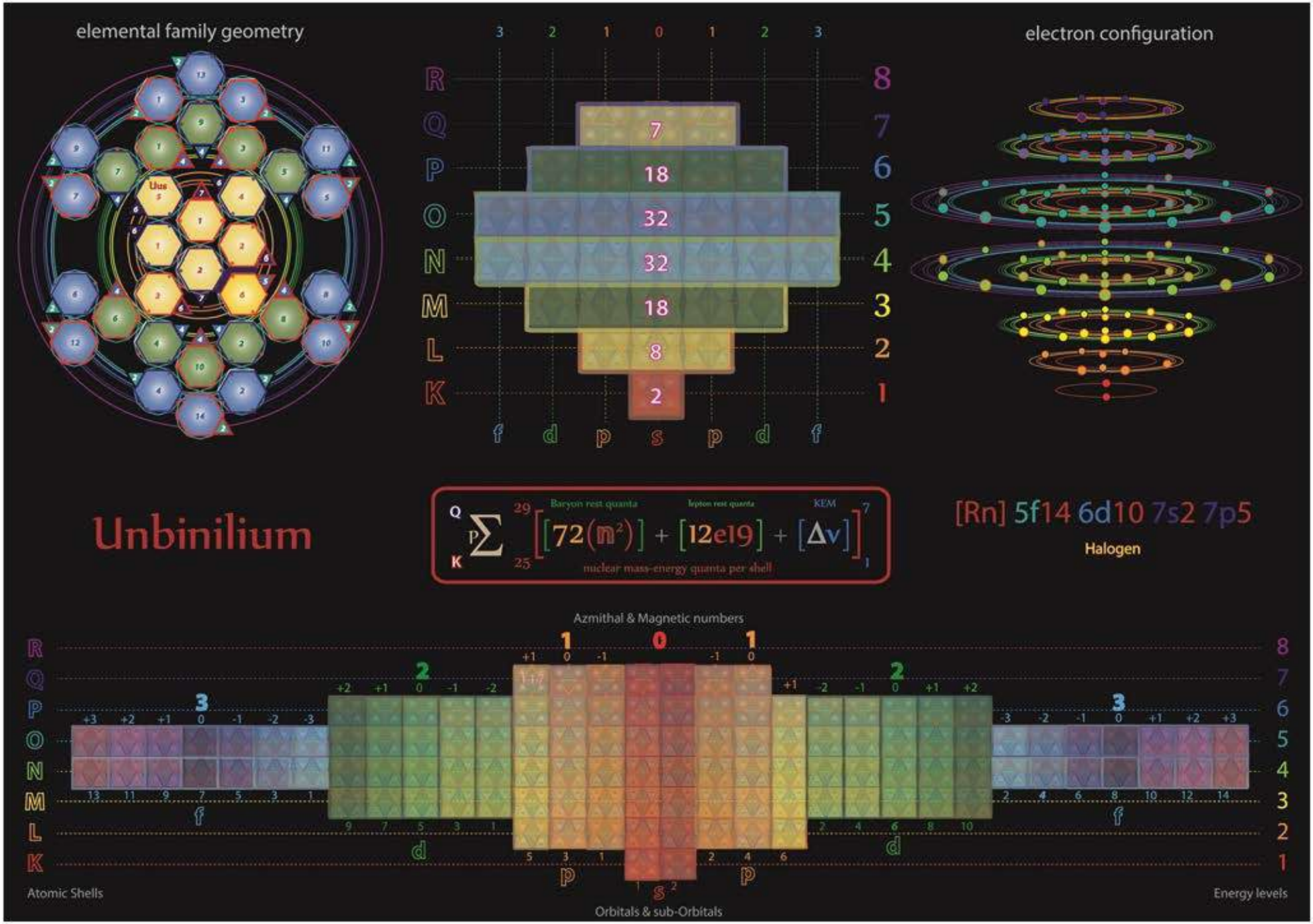

Tetryonics 53.117 - Ununseptium atomic config

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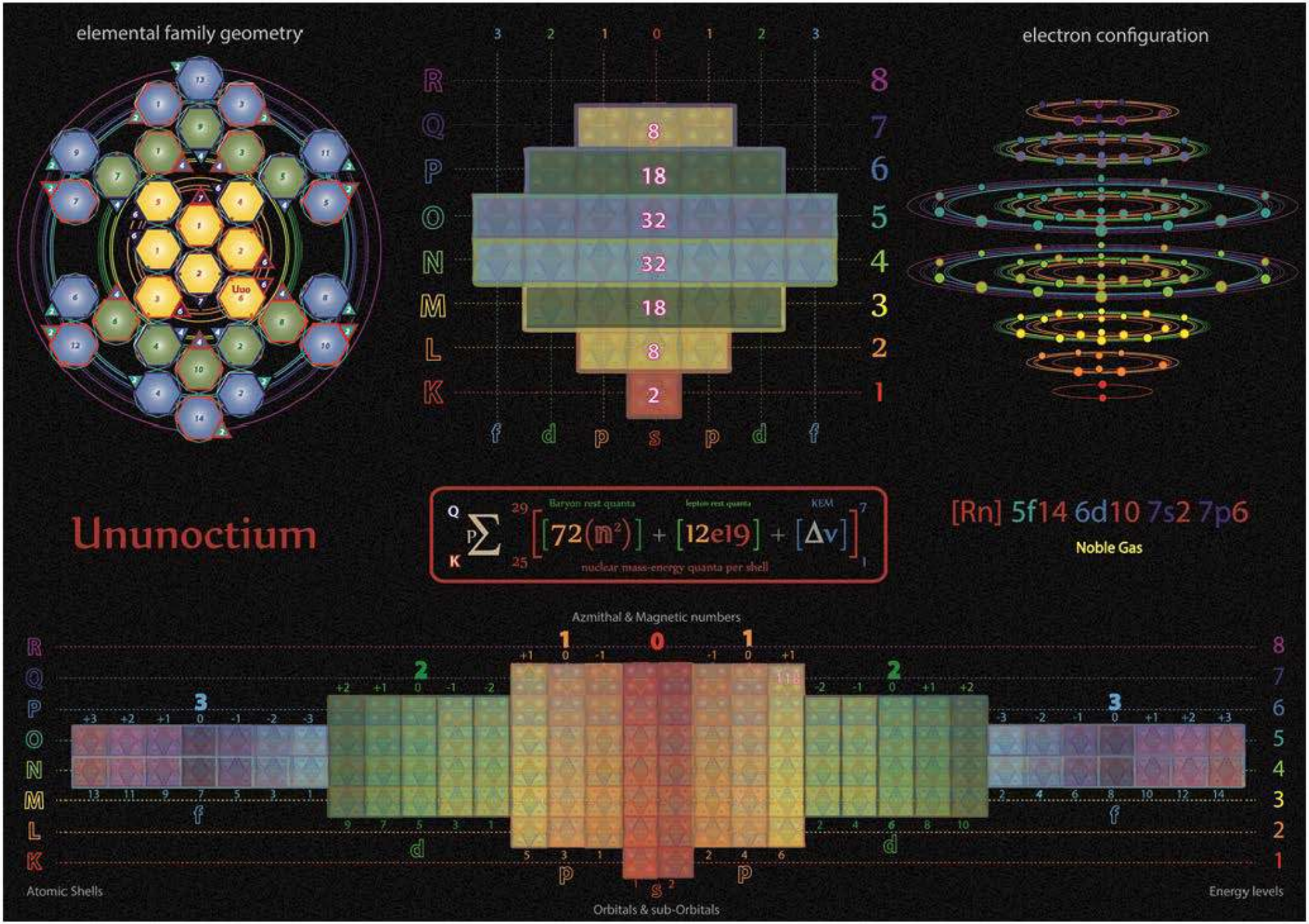

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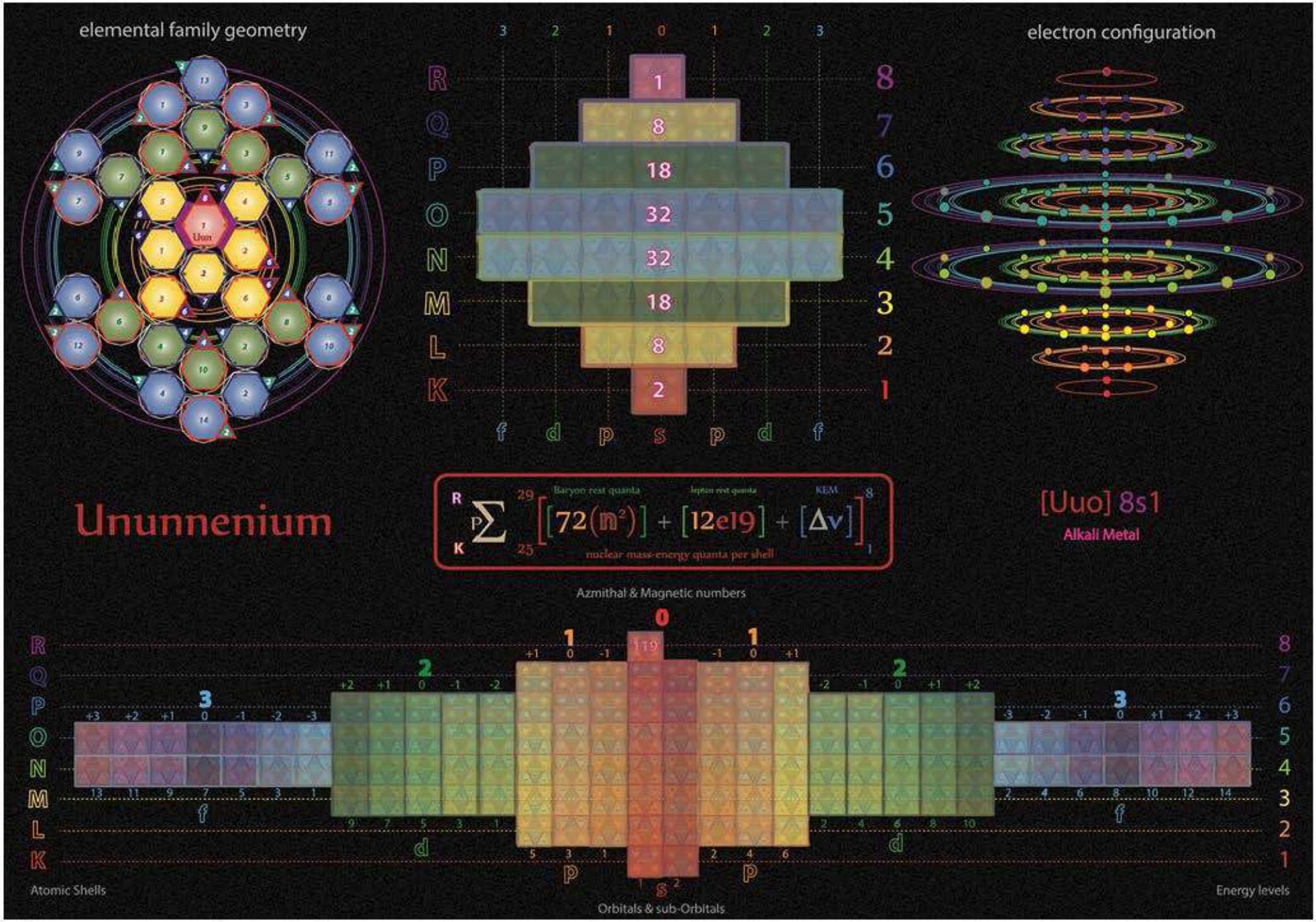

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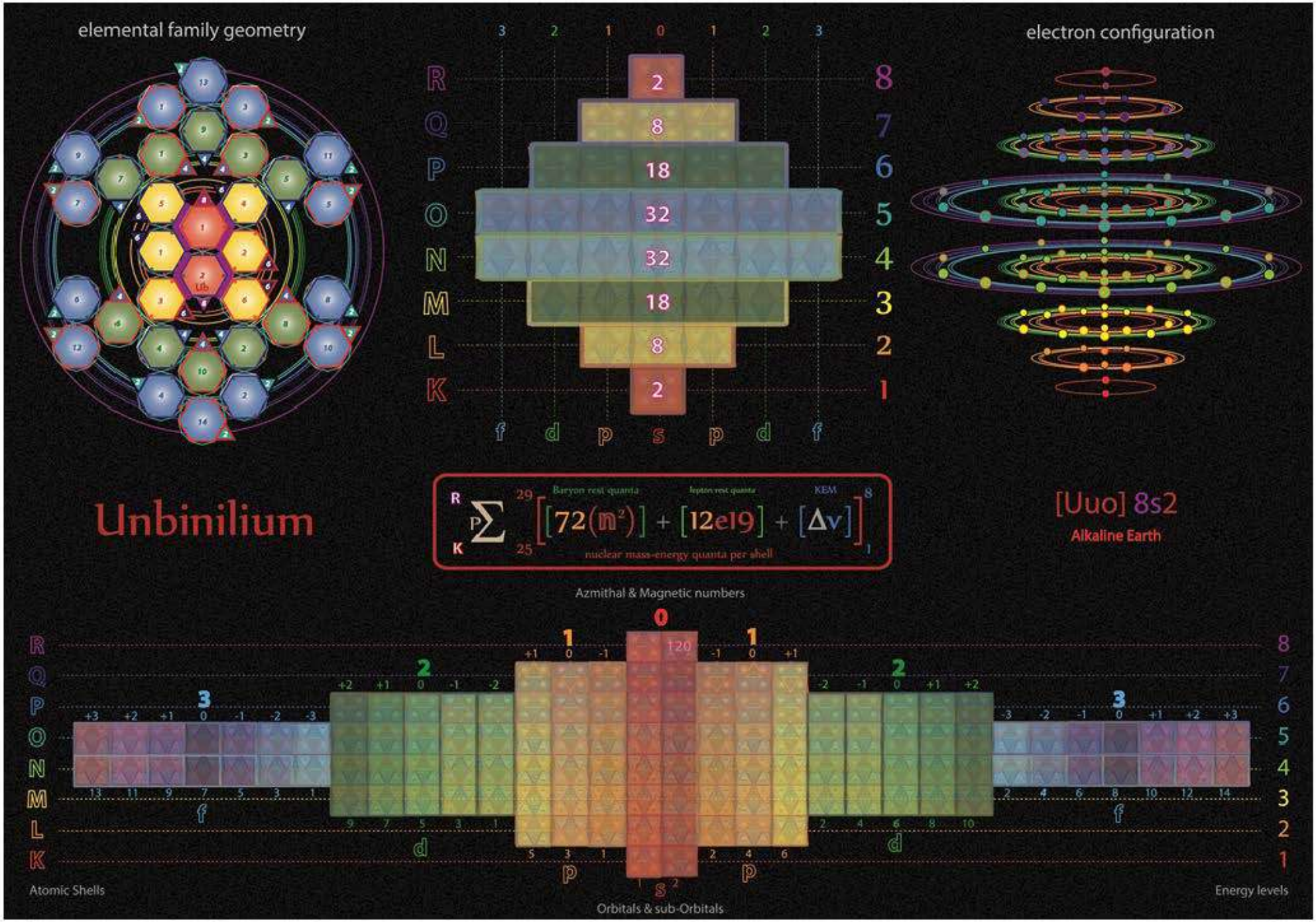

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Chemical element bonding

All Deuterium nuclei pack in hexagonal patterns
to form larger atoms & molecules

Individual chemical element topologies
are mapped using Cormier grid

Hexagonal tiling
is a regular tiling of
the Euclidean plane

Tetryonic chemistry
utilises hexagonal tiling for
modelling chemical bonds

H

s1

s2

p5 p4 s1 p1 p2 s2 p3 p6

p6 p5 p1 n p4 p2 p3

unfilled atomic orbital
positions are indicated
by vacant hexagonal
tiles

p5 p4 s1 p1 p2 s2 p3 p6

Euclidean space is tiled with
equilateral tessellations
of Planck mass-energy
geometries

Tetryonic mass-Matter topologies
can be represented as hexagonal
cells in a Cormier grid

When seeking the most stable energy configurations
nuclei & atoms bond to create filled s&p [stable octet]
electron orbital patterns as welll as filled d & f orbitals.

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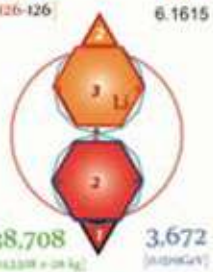
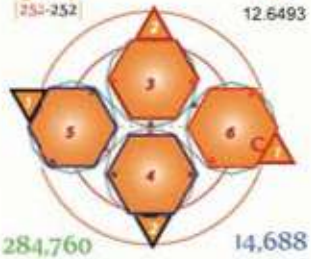
Periodic Table Atomic configurations

252 [126-126] **Li** 6.1615



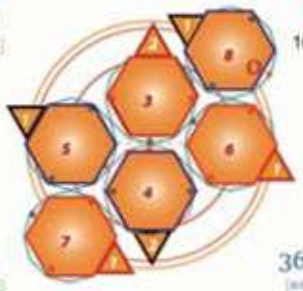
138,708 3,672

504 [252-252] **C** 12.6493



284,760 14,688

672 [336-336] **O** 16.9744



382,128 36,864

Allotropes are different structural forms of the same element and can exhibit quite different physical properties and chemical behaviours

Allotropes

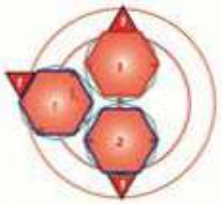
The Periodic Table, although useful in identifying Elements via their atomic and quantum numbers, does not reflect all the charged topologes that Deuterium nuclei can form as they combine.

Various atomic configurations with the same Tetryonic charge, but differing in their final mass-Matter topologies and properties can be formed - they are the Allotropes

Some of the more plentiful chemical elements form this way

Lithium

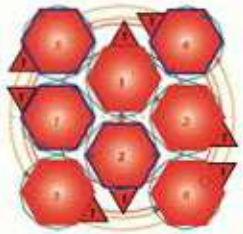
252 [126-126] **Li** 6.1615



135,036

Oxygen

672 [336-336] **O** 15.995



360,096

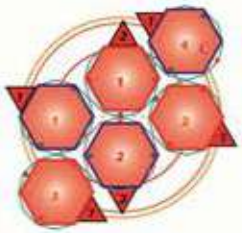
Carbon

504 [254-254] **C12** 11.9968

270,072

6 [Protons [24-12] Neutrons [18-18] electrons [0-12]] n1

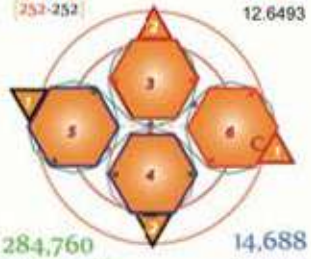
504 [252-252] **C** 11.9968



270,072

6 [Protons [24-12] Neutrons [18-18] electrons [0-12]] n1

504 [252-252] **C** 12.6493



284,760 14,688

6 [Protons [24-12] Neutrons [18-18] electrons [0-12]] n1-2

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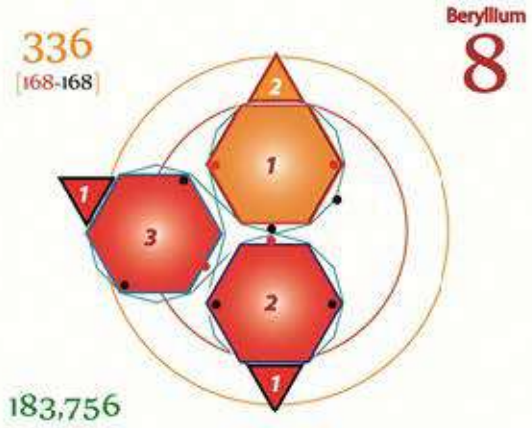
Allotropes are elements created from the same number of Deuterium nuclei as periodic elements but possess a differing mass-Matter topology

Q

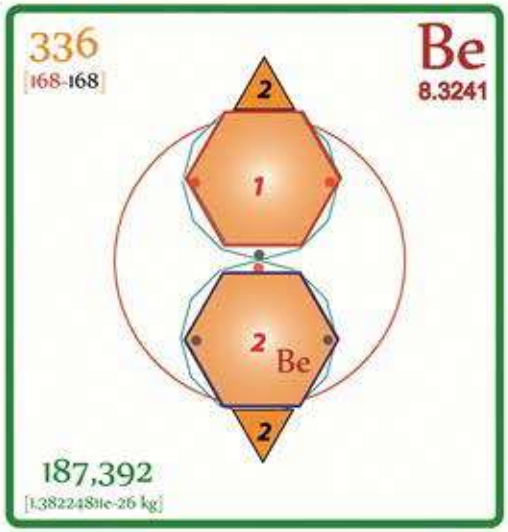
same component charge



different Matter geometries

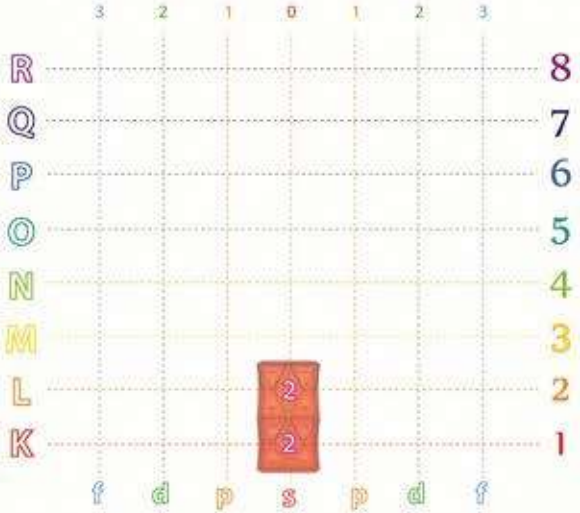
M

The varying material geometries allows what is the same chemical element to possess vastly different bonding points and chemical attributes

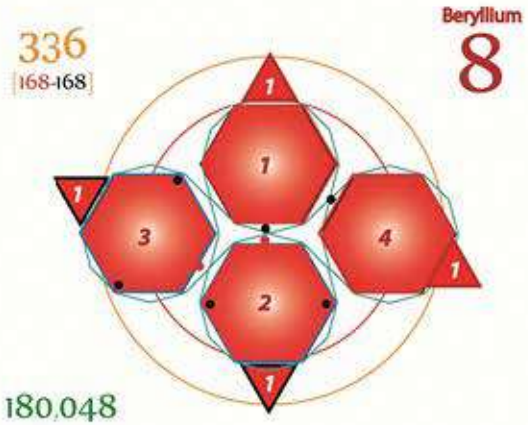


Allotropic geometries

[charge vs Matter]

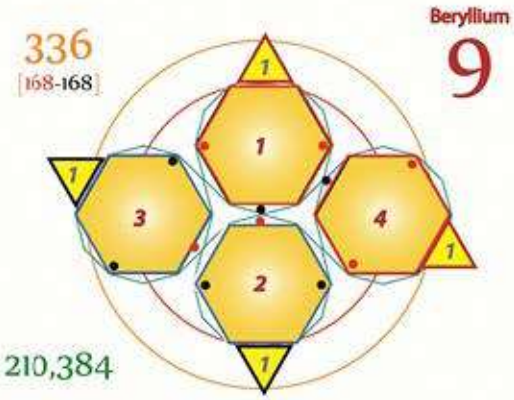


Some element allotropes have different Matter topologies that persist in different phases



Allotropes vs. Isotopes

Isotopes are elementary atoms with the same number of nuclei, but with differing energy levels, resulting in different mass-energies



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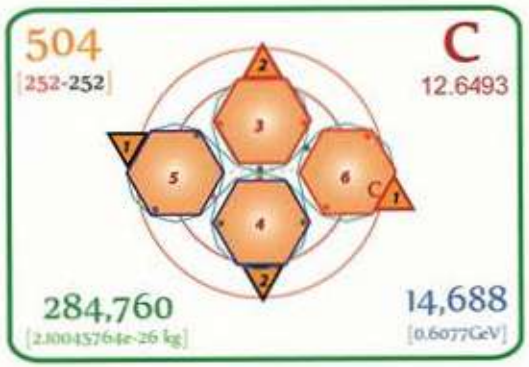
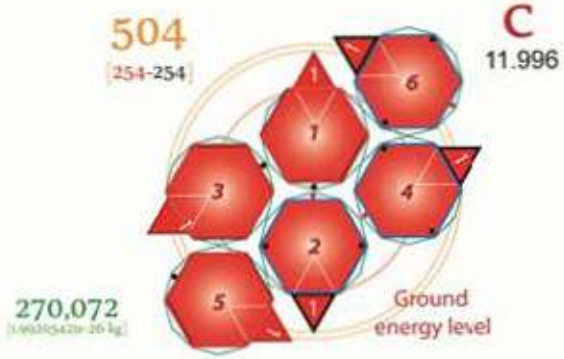


Carbon Allotropes

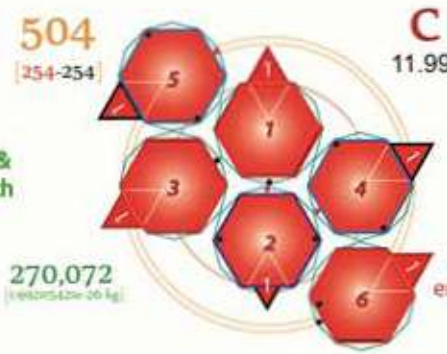
Carbon is capable of forming many allotropes due to its valency.

Well known forms of carbon include:

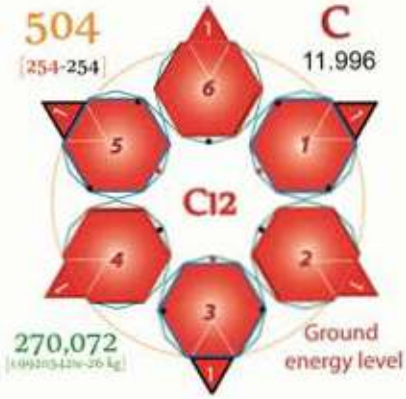
Carbon
Diamond
Graphite
Graphene
Amorphous carbon
Buckminsterfullerenes
Carbon nanotubes
Glassy carbon
atomic & diatomic carbon



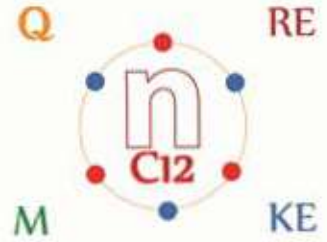
Tetryonic theory affords us the ability to model the charged mass-energy geometries & 3D Matter topologies of each element along with its bonding points



It also allows for the calculation of the molar rest mass-energy geometry of any Matter topology



Graphene has a unique p orbital arrangement of its electrons



Electron Configuration

[n] p6

Shell			Molar meM		Nuclei per shell
R	8	446,976	19.855	6	
Q	7	418,680	18.598	6	
P	6	391,392	17.385	6	
O	5	365,112	16.218	6	
N	4	339,840	15.095	6	
M	3	315,576	14.018	6	
L	2	292,320	12.985	6	
K	1	270,072	11.996	6	

energy level

5 3 1 2 4 6

Carbon-14, a radioactive isotope of carbon with a half-life of 5,730 years, is used to find the age of formerly living things through a process known as radiocarbon dating.

In 1961 the International unions of physicists and chemists agreed to use the mass of the isotope carbon-12 as the basis for atomic weight.

There are nearly ten million known carbon compounds and an entire branch of chemistry, known as organic chemistry, is devoted to their study.

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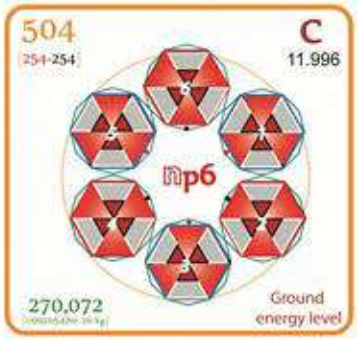
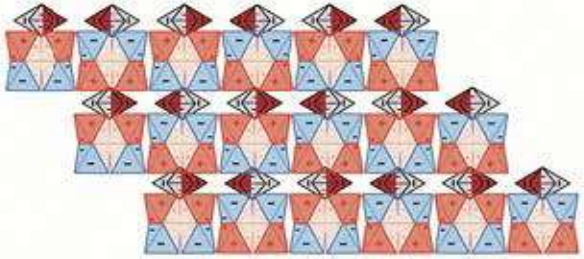
Graphene

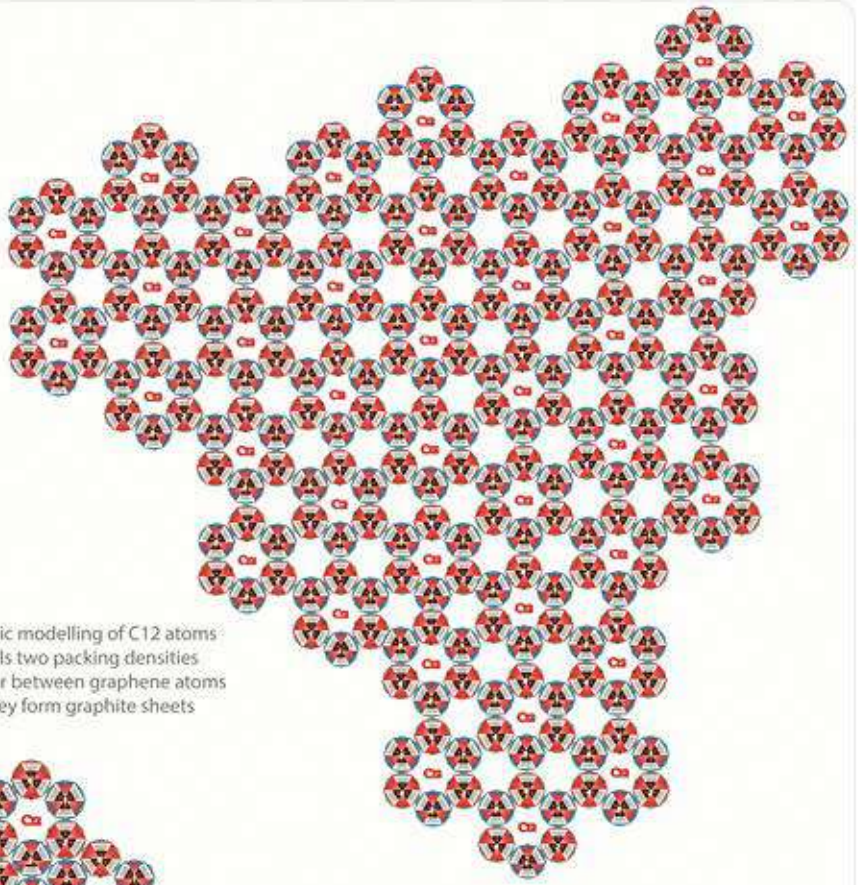


Graphene is also an allotrope of carbon.

Its structure is one-atom-thick planar sheets of sp2-bonded carbon atoms that are densely packed in a honeycomb crystal lattice



Graphite electrons can act as atomic bearings between the planar sheets of graphene



Tetryonic modelling of C12 atoms reveals two packing densities can occur between graphene atoms as they form graphite sheets

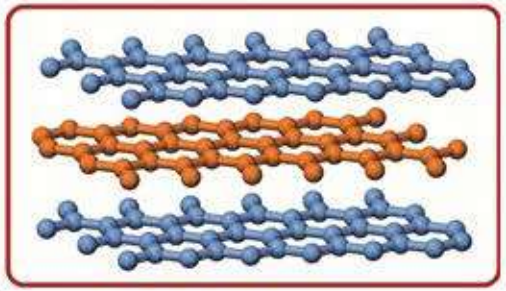
Graphite

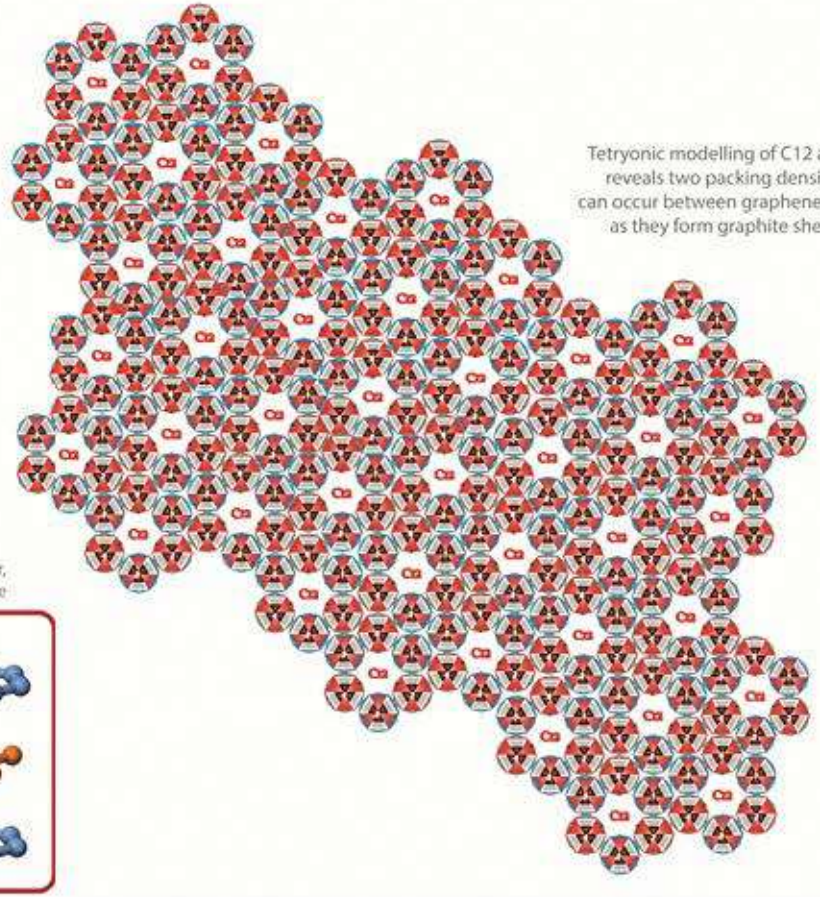
The mineral graphite is an allotrope of carbon.

Unlike periodic table carbon [diamond], graphite is an electrical conductor, a semi-metal.

And Graphite is the most stable form of carbon under standard conditions.

Graphite has a layered, planar structure. In each layer, the carbon atoms are arranged in a hexagonal lattice





Unlike periodic carbon where electrons are tightly bound, graphite is highly conductive, with electrical energy being propagated via the electrons & their KEM fields

Graphene electrons are loosley bound to the top of the Deuterium nuclei

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Carbon Nanotubes

Carbon nanotubes (CNTs) are allotropes of carbon with a cylindrical nanostructure.

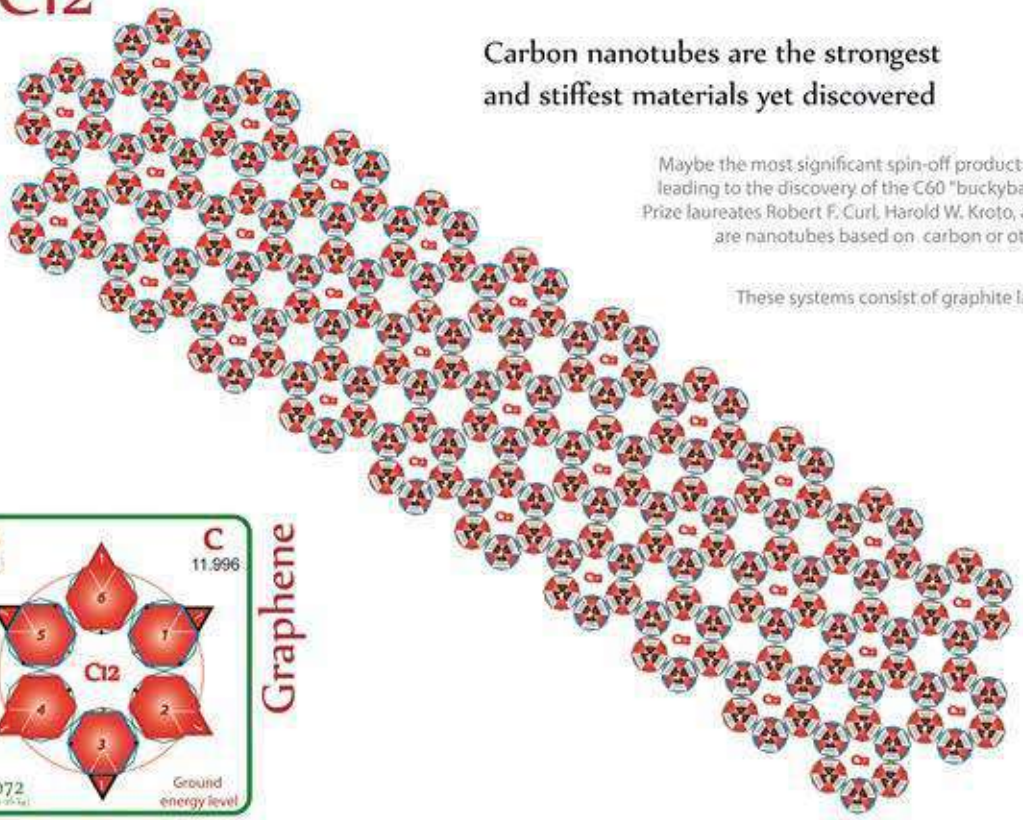
Large molecules consisting only of carbon, known as buckminsterfullerenes, or buckyballs, have recently been discovered and are currently the subject of much scientific interest.

A single buckyball consists of 60 or 70 carbon atoms (C60 or C70) linked together in a structure that looks like a soccer ball.

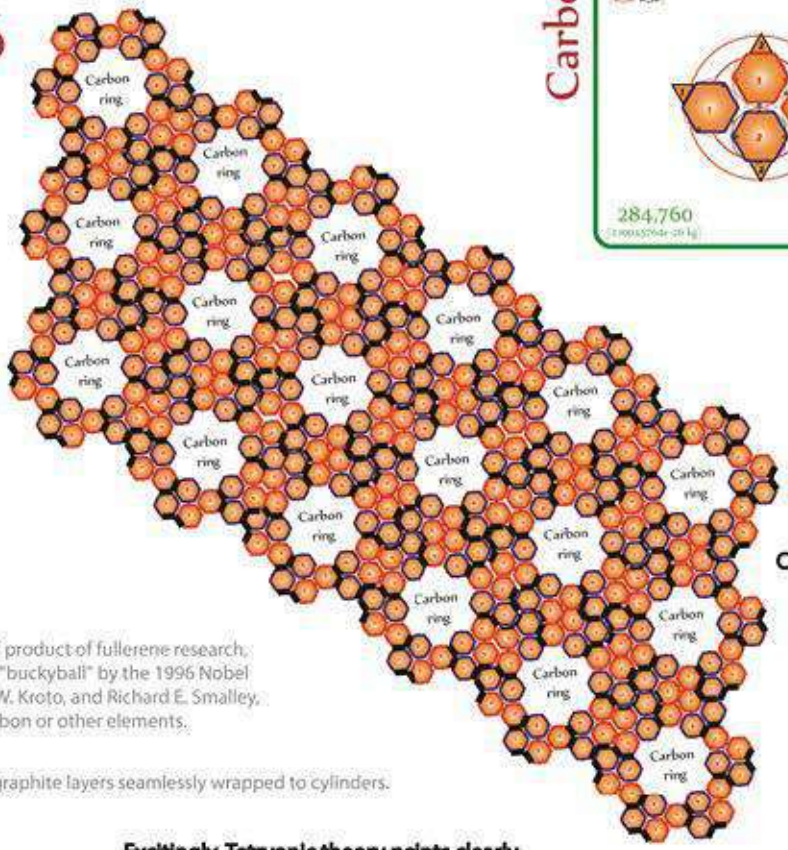
They can trap other atoms within their framework, appear to be capable of withstanding great pressures and have magnetic and superconductive properties.

They can be thought of as a sheet of graphite (a hexagonal lattice of carbon) rolled into a cylinder.

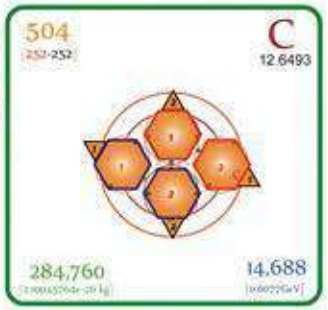
C12



C36



Carbyne



Carbon

Carbon nanotubes are the strongest and stiffest materials yet discovered

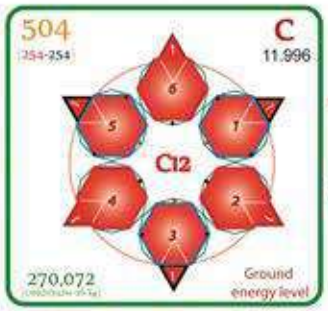
Maybe the most significant spin-off product of fullerene research, leading to the discovery of the C60 "buckyball" by the 1996 Nobel Prize laureates Robert F. Curl, Harold W. Kroto, and Richard E. Smalley, are nanotubes based on carbon or other elements.

These systems consist of graphite layers seamlessly wrapped to cylinders.

Excitingly, Tetryonic theory points clearly to the possibility that organo-carbon nanotubes can be created.

Where C36 periodic carbon could be used insetad of conventional C12 graphene atoms

Carbyne



Graphene

C60

Nanotubes are members of the fullerene structural family, which also includes the spherical buckyballs, and the ends of a nanotube may be capped with a hemisphere of the buckyball structure.

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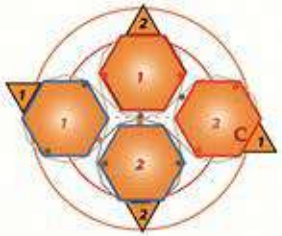
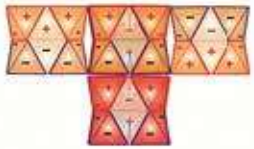
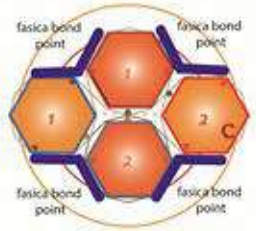
Diamonds

are a metastable allotrope of carbon,
where the carbon atoms are arranged in
cubic crystal structure called a diamond lattice.



Periodic [C6] Carbon

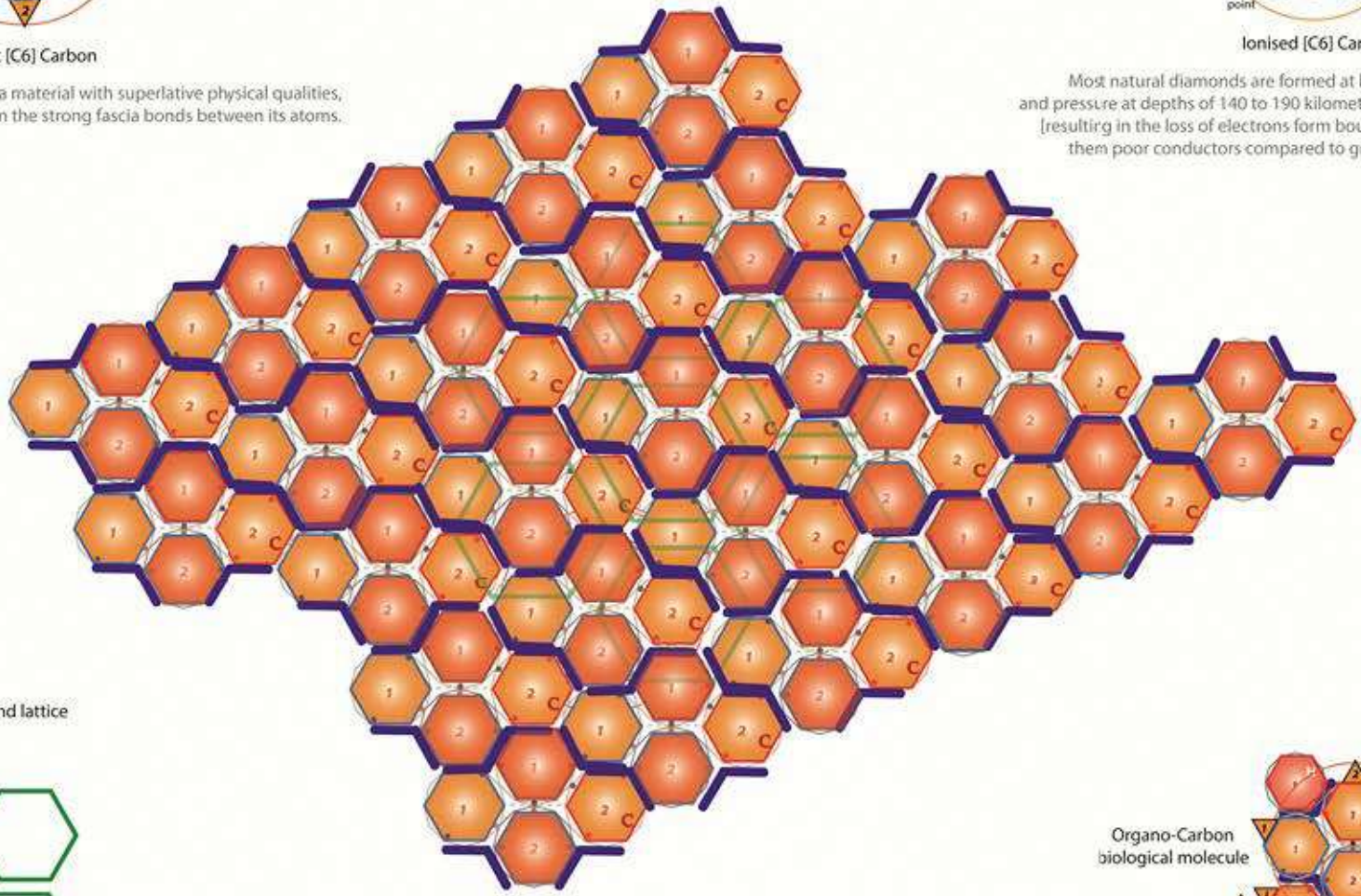




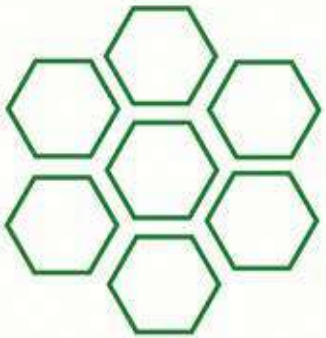
Ionised [C6] Carbon

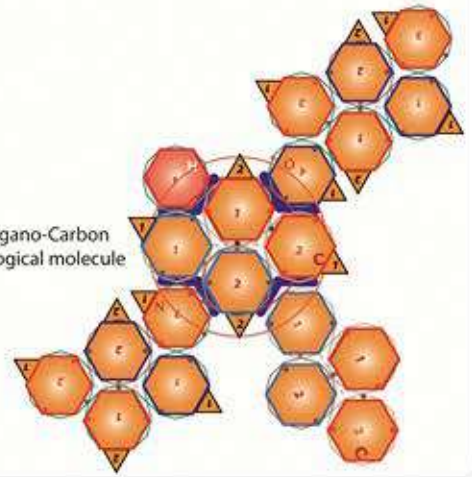
Diamonds are renowned as a material with superlative physical qualities,
most of which originate from the strong fascia bonds between its atoms.

Most natural diamonds are formed at high temperature
and pressure at depths of 140 to 190 kilometers in the Earth's mantle
[resulting in the loss of electrons form bound positions, making
them poor conductors compared to grahphene atoms].



filled n[C7] Carbon diamond lattice





Organo-Carbon
biological molecule

The chemical bonds that hold the carbon atoms in diamonds together
are stronger than those in graphite.

In diamonds, the bonds form an inflexible three-dimensional lattice, whereas in graphite,
the atoms are tightly bonded into sheets, which can slide easily over one another, making the overall structure weaker

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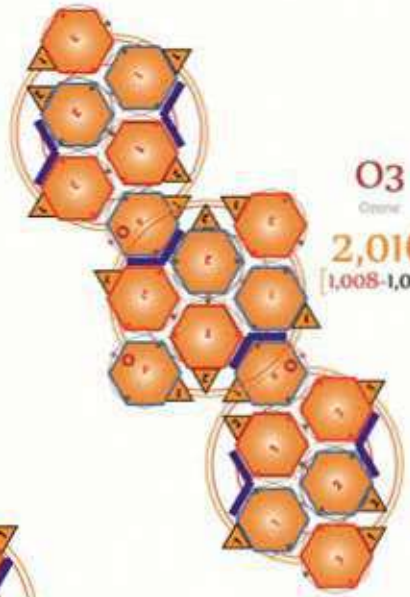
Oxygen Allotropes

There are several known allotropes of oxygen.
The most familiar is molecular oxygen (O2), present at significant levels in Earth's atmosphere and also known as dioxygen or tripiet oxygen.
Another is the highly reactive ozone (O3).

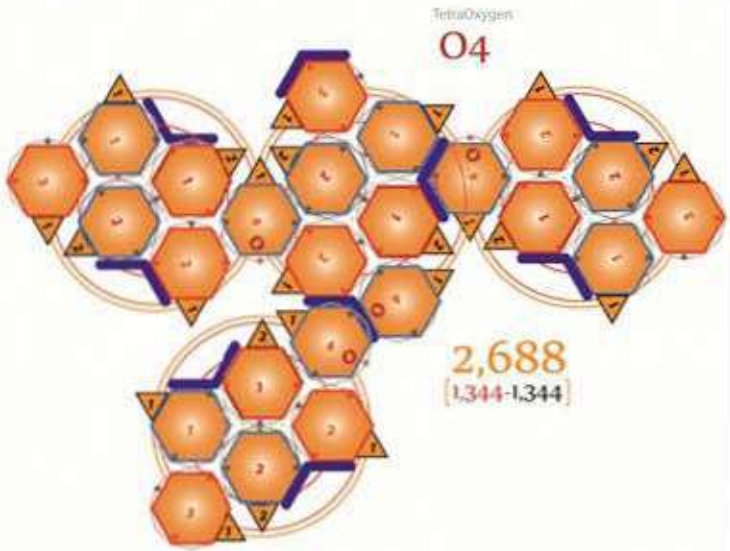
Others include:
Atomic oxygen (O1, a free radical)
Singlet oxygen (O2), either of two metastable states of molecular oxygen
Tetraoxygen (O4), another metastable form
Solid oxygen, existing in six variously colored phases, of which one is O8 and another one metallic

Atomic Oxygen also forms bonds easily with Hydrogen to create Hydroxy compounds

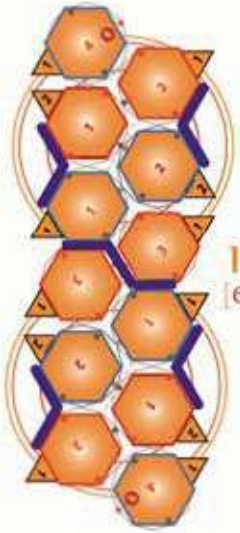
OH
Hydroxide
720
[360-360]



O3
Ozone
2,016
[1,008-1,008]



TetraOxygen
O4
2,688
[1,344-1,344]

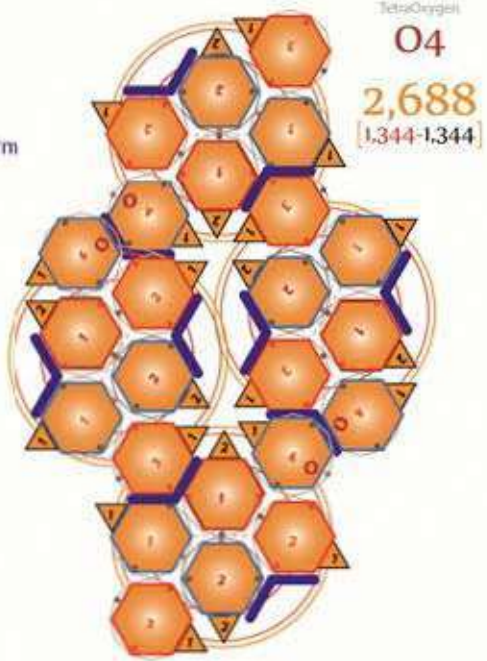


O2
Oxygen
1,344
[672-672]

All charge fascia interact and bind where possible to form neutral chemical bonds

1,344
[672-672]
O2
Oxygen

O3
Ozone
2,016
[1,008-1,008]



TetraOxygen
O4
2,688
[1,344-1,344]

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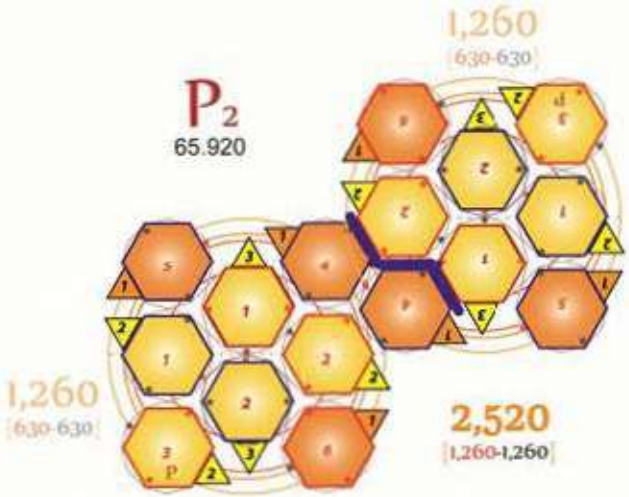
Phosphor Allotropes

Elemental phosphorus can exist in several allotropes; the most common of which are white and red solids.

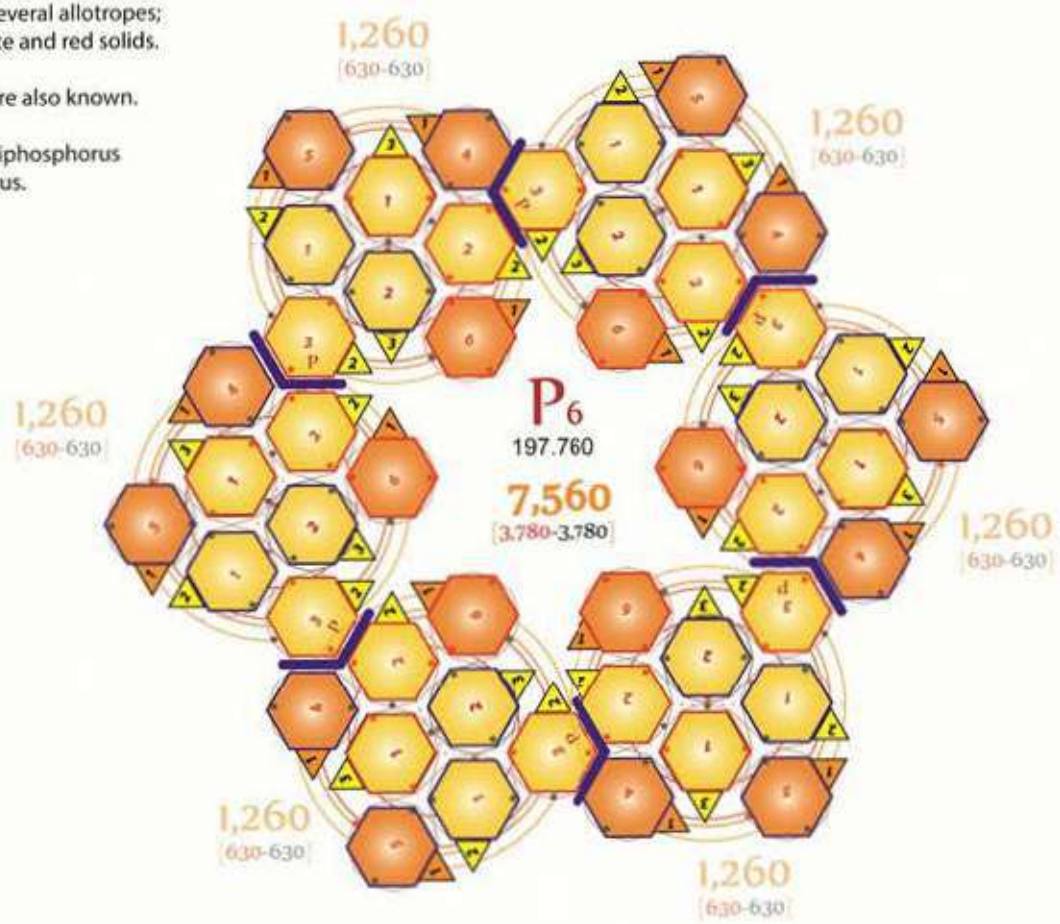
Solid violet and black allotropes are also known.

Gaseous phosphorus exists as diphosphorus and atomic phosphorus.



The diphosphorus allotrope (P2) can be obtained normally only under extreme conditions (for example, from P4 at 1100 kelvin).

Nevertheless, some advancements were obtained in generating the diatomic molecule in homogenous solution, under normal conditions with the use by some transitioe metal complexes (based on for example tungsten and niobium).



Black phosphorus is the thermodynamically stable form of phosphorus at room temperature and pressure. It is obtained by heating white phosphorus under high pressures (12,000 atmospheres).

In appearance, properties and structure it is very like graphite, being black and flaky, a conductor of electricity, and having puckered sheets of linked atoms

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Sulfur Allotropes

2,688
[1,344-1,344]

S2
disulfur

4,032
[2,016-2,016]

S3
trisulfur

S4
tetrasulfur

5,376
[2,688-2,688]

Charged fascia interactions between differing elements result in the familiar chemical bonds

Sulfur [like Carbon] can form Chains or Ring compounds

There are a large number of allotropes of sulfur. In this respect, sulfur is second only to carbon.

cyclo-hexasulfur

8,064
[4,032-4,032]

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Isotopes

In addition to forming varying allotropic elements

Atoms can also absorb energy directly and create numerous elemental isotopes as a result of their differing nuclear energy levels

Deuterium nuclei with bound photo-electrons form quantum-scale synchronous converters

0	Hydrogen	22,512	24,384	26,352	28,416	30,576	32,832	35,184	37,632
Element		1	2	3	4	5	6	7	8
1	Deuterium	45,012	48,720	52,596	56,640	60,852	65,232	69,780	74,496
2	Helium	90,024	97,440	105,192	113,280	121,704	130,464	139,560	148,992
3	Lithium	135,036	146,160	157,788	169,920	182,556	195,696	209,340	223,488
4	Berylium	180,048	194,880	210,384	226,560	243,408	260,928	279,120	297,984
5	Boron	225,060	243,600	262,980	283,200	304,260	326,160	348,900	372,480
6	Carbon	270,072	292,320	315,576	339,840	365,112	391,392	418,680	446,976
7	Nitrogen	315,084	341,040	368,172	396,480	425,964	456,624	488,460	521,472
8	Oxygen	360,096	389,760	420,768	453,120	486,816	521,856	558,240	595,968
9	Fluorine	405,108	438,480	473,364	509,760	547,668	587,088	628,020	670,464
10	Neon	450,120	487,200	525,960	566,400	608,520	652,320	697,800	744,960
11	Sodium	495,132	535,920	578,556	623,040	669,372	717,552	767,580	819,456
12	Magnesium	540,144	584,640	631,152	679,680	730,224	782,784	837,360	893,952
13	Aluminium	585,156	633,360	683,748	736,320	791,076	848,016	907,140	968,448
14	Silicon	630,168	682,080	736,344	792,960	851,928	913,248	976,920	1,042,944
15	Phosphorus	675,180	730,800	788,940	849,600	912,780	978,480	1,046,700	1,117,440
16	Sulfur	720,192	779,520	841,536	906,240	973,632	1,043,712	1,116,480	1,191,936
17	Chlorine	765,204	828,240	894,132	962,880	1,034,484	1,108,944	1,186,260	1,266,432
18	Argon	810,216	876,960	946,728	1,019,520	1,095,336	1,174,176	1,256,040	1,340,928
19	Potassium	855,228	925,680	999,324	1,076,160	1,156,188	1,239,408	1,325,820	1,415,424
20	Calcium	900,240	974,400	1,051,920	1,132,800	1,217,040	1,304,640	1,395,600	1,489,920

It is the increased nucleonic energy levels that creates isotopes (not extra Neutrons within an atomic nucleus)

The energy level of Baryons determines the KEM energies of photo-electrons bound to them

Most isotopes are considered to be radioactive as a result of the nuclei seeking to release excess energy in the form of photons of energy or particles with high kinetic energies

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Carbon Isotopes

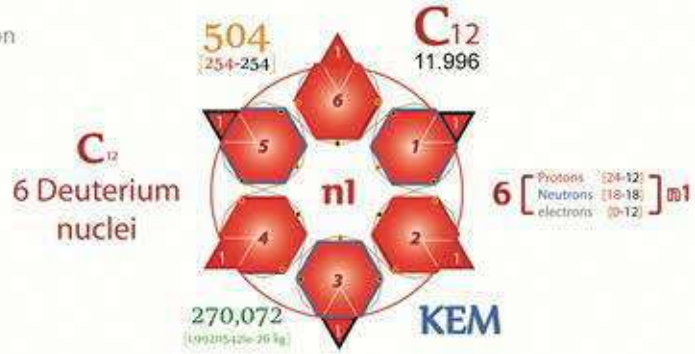
It is widely held in the scientific community tha:
Carbon-14, 14C, or radiocarbon, is a radioactive isotope of carbon with a nucleus containing 6 protons and 8 neutrons.

It is in fact a nucleus comprised of 6 deuterium nuclei [with 6 Protons, 6 Neutrons & 6 electrons]

The mistaken belief in 'extra' neutrons being present in the nucleus stems from the fact that electrons and protons combine in equal numbers in the atomic nucleus and historically attributing the mass in excess of this as being the result of the mass contribution of 'extra' neutrons

Tetryonics finally corrects this erroneous assumption

Carbon 12-14



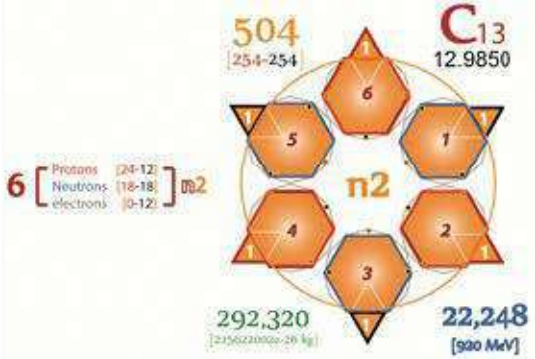
There are NO extra neutrons (in excess of the element's Z#) in the nuclei of atomic isotopes.

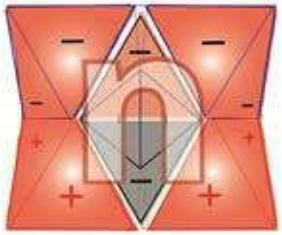
The measured 'excess mass' is the direct result of the raised quantum levels of the Deuterium nuclei that comprise each atomic element

And is compreletely accounted for in Tetryonic theory by calculating for the total rest mass-energies in each elementary Matter topology.

The 'extra' mass historically attrtibuted to neutron numbers above that of the elemental number are now reflected as stored kinetic 'chemical' energies as they always were.

ALL elements & isotopes have equal numbers of Protons, electrons & Neutrons





Quantum levels of atomic nuclei contribute to the molar mass [Isotopes are higher energy nuclei]

	n1	n2	n3	n4	n5	n6	n7	n8
C12	270,072	292,320	315,576	339,840	365,112	391,392	418,680	446,976
KEM diff	0	22,248	45,504	69,768	95,040	121,320	148,608	176,904
neutron #		.98	2.0	3.1	4.2	5.4	6.6	7.8

This applies equally to all atomic nuclei

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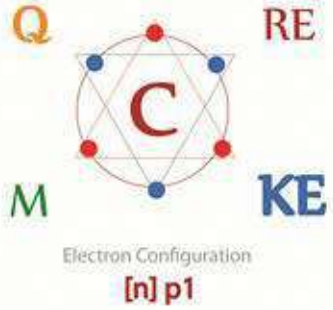
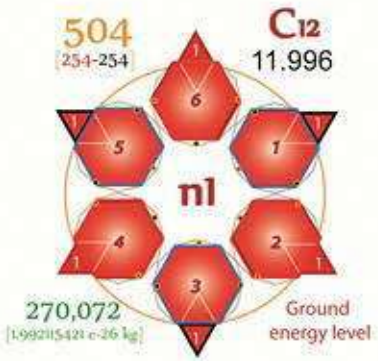
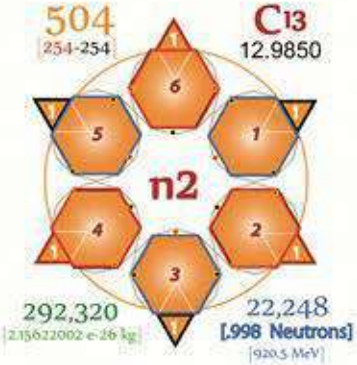
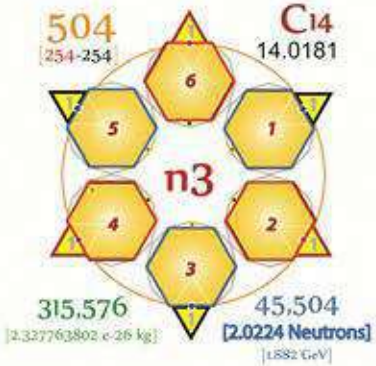


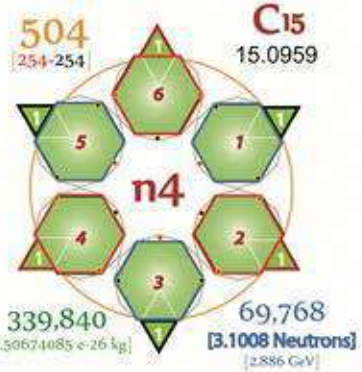
Atoms store mass-energies
in their standing wave Matter topologies
and release it via radioactive decay paths

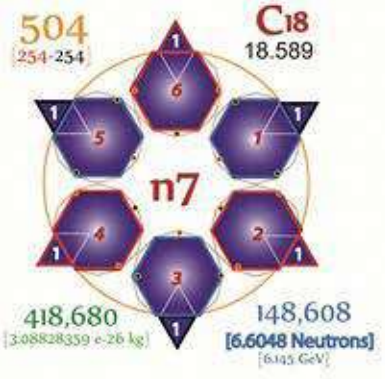
It is increased kinetic energy level geometries that create nuclear isotopes (not extra Neutrons within a nucleus)

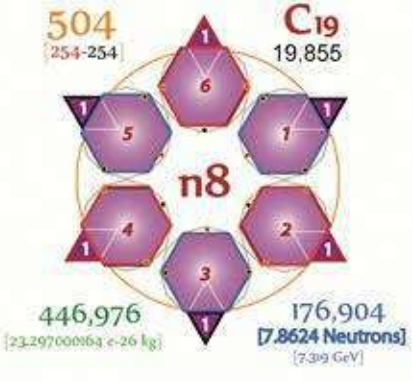












22,500
[1 Neutron]

n

[930.97 MeV]

Kinetic mass-energy geometries
stored in 3D Matter topologies
is released as Chemical energies

Deuterium nuclei with bound photo-electrons form quantum-scale synchronous converters

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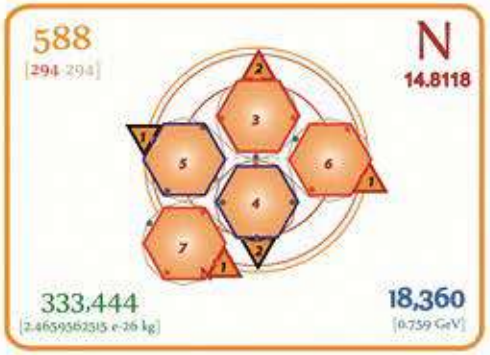
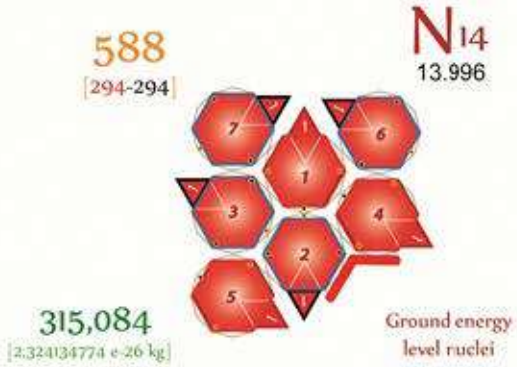


It is increased Nucleonic energy levels that creates Isotopes
(not extra Neutrons within any elementary Nucleus)

Nitrogen gas

Nitrogen Allotropes & Isotopes

Isotopes are created by increasing the number of Planck mass-energies stored in the standing-wave geometries of chemical elements



The charged mass-energy geometries of differing allotropic topologies create various chemical bond points

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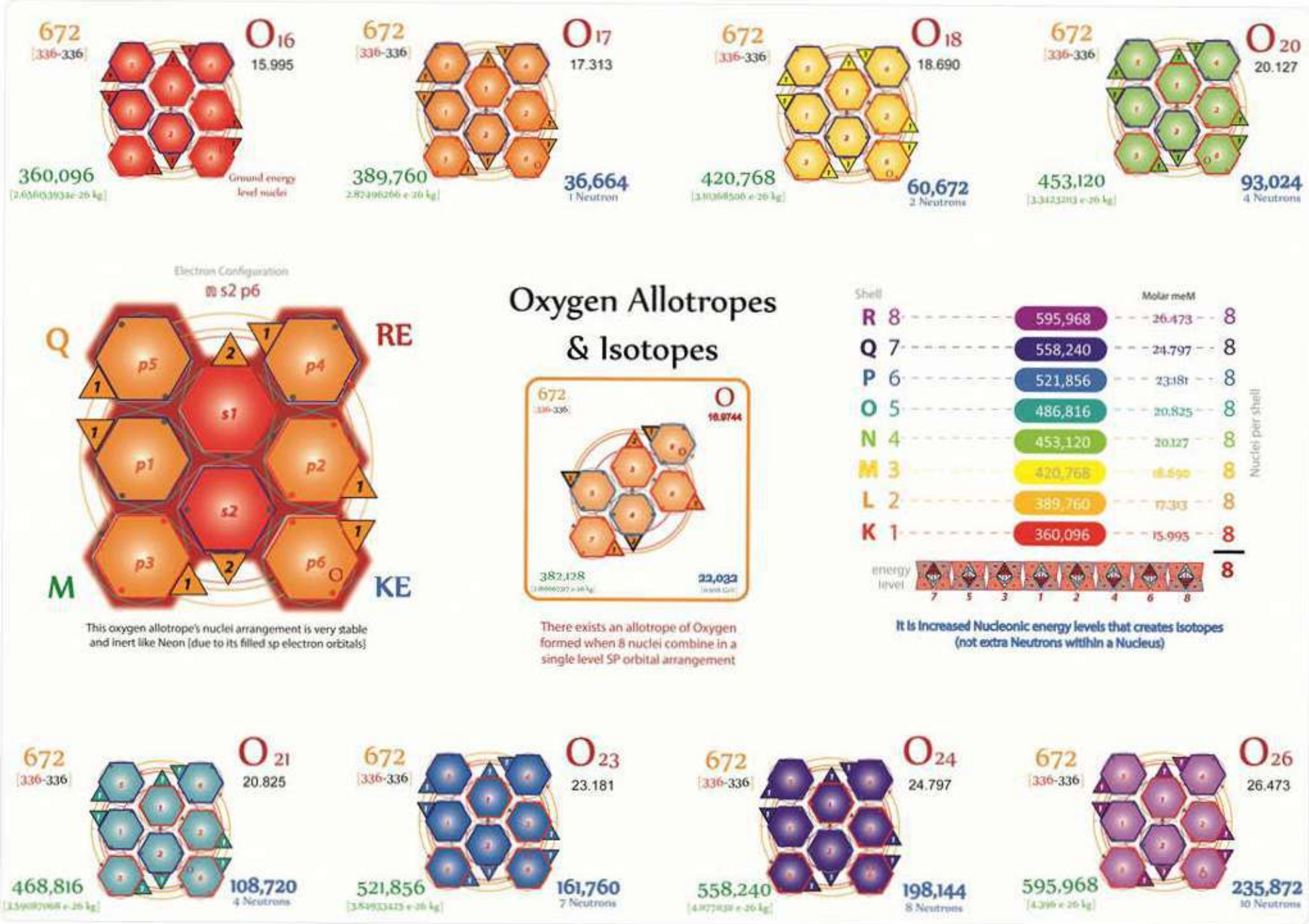

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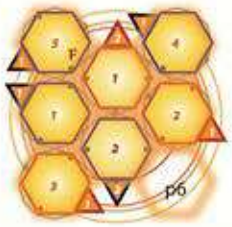
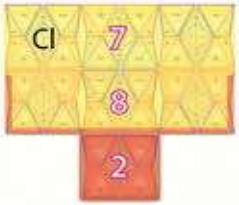
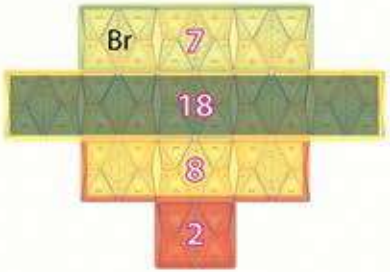
Bose–Einstein condensates exist
at the low energy extremes

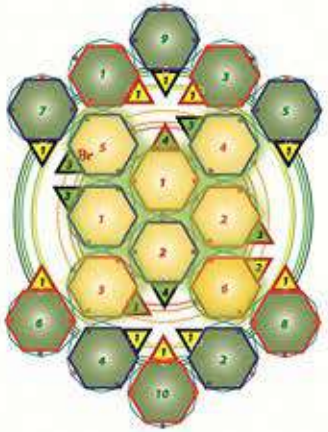




Gaseous



Liquid



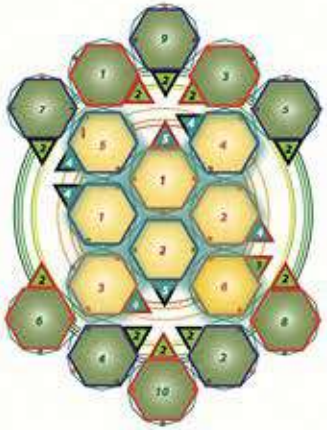
The Natural states of Matter

(room temperature)

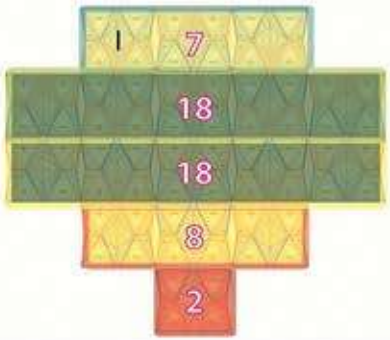
Elements appear in their natural phase at room temperature as a gas, liquid, solid or synthetic

As energy is added or removed from any element's
charged Matter topology or their baryonic KEM field geometry
their phase states & Brownian motion changes

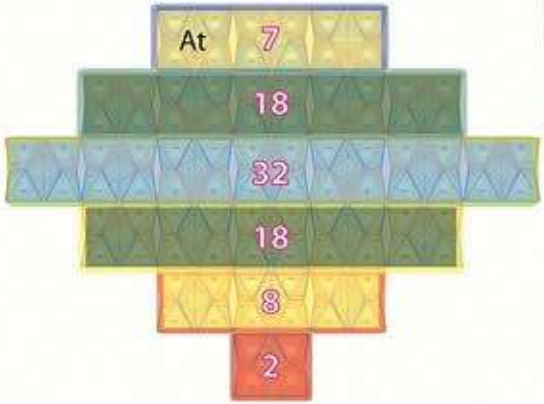
The halogen element family
provides a great example of all 4 states
of Matter at room temperature

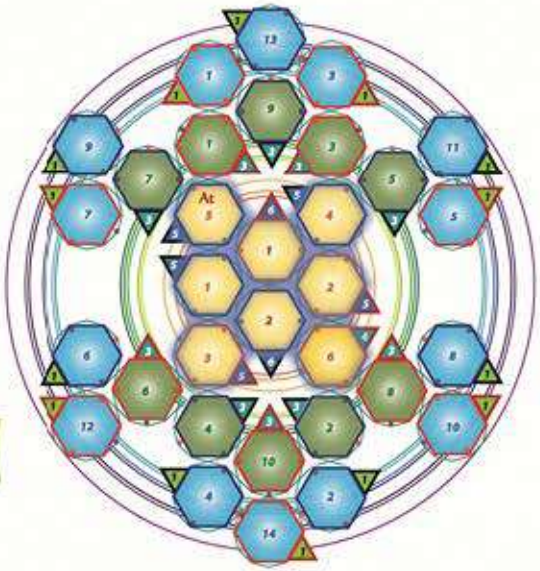


Solid



Radioactive





At the high energy extremes
exist the Plasma states of Matter

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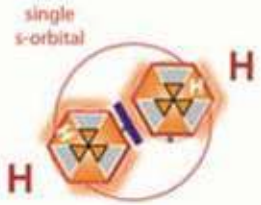
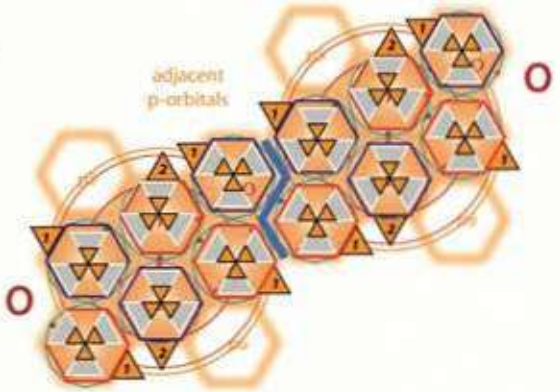
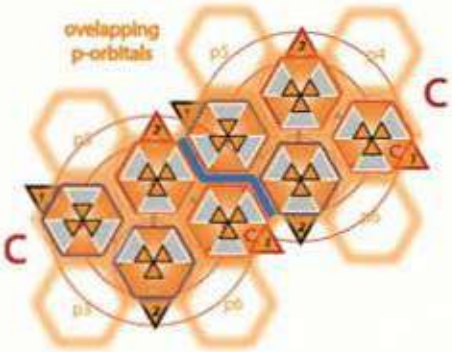
Chemical bonds

A chemical bond is an attraction between atoms tha: allows the formation of chemical substances that contain two or more atoms.

Particle charge & Inter-fascia electric interaction provides the foundation of chemical bonds

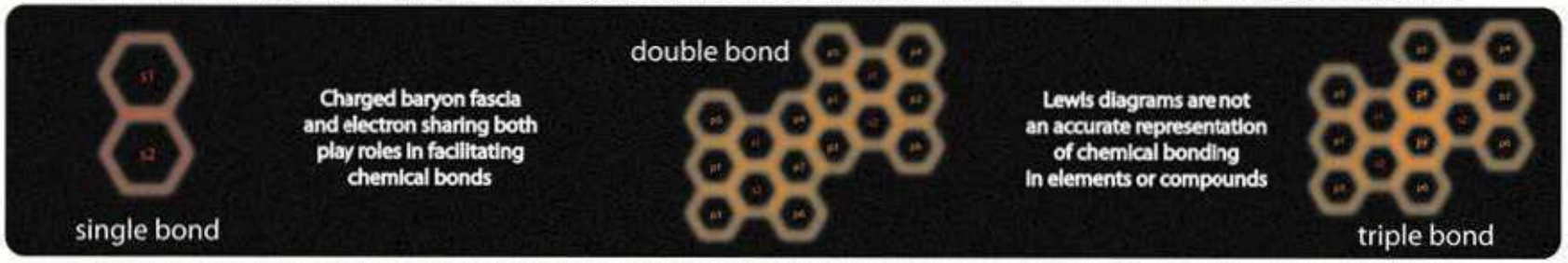






It is usually taught that based on electron sharing principles a single bond contains 2 paired electrons, a double bond has 4 electrons and a triple bond has 6 shared electrons

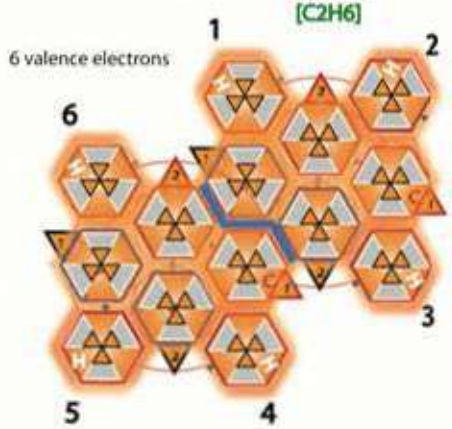
filled electron shells [weak KEMical bonds]


single bond
Charged baryon fascia and electron sharing both play roles in facilitating chemical bonds
double bond
Lewis diagrams are not an accurate representation of chemical bonding in elements or compounds
triple bond

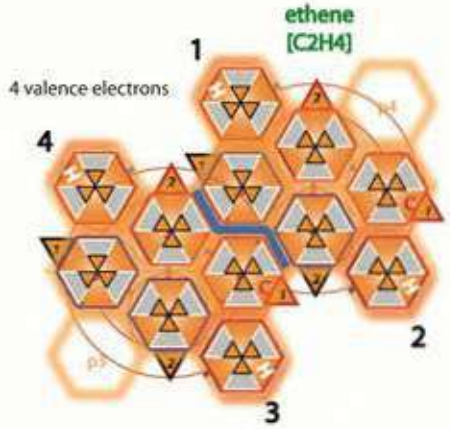
unfilled electron shells [stronger KEMical bonds]

Tetryonic geometry provides an advanced quantum topology for all atoms and compounds that is superior to the older Lewis diagrams and even molecular orbital theory, facilitating a clear understanding of the quantum geometry of each element, its nuclear bonds and electron sharing in all compound chemical structures; along with the core & valence electron configurations & interactive electric charge fascia bonding positions for each compound created.

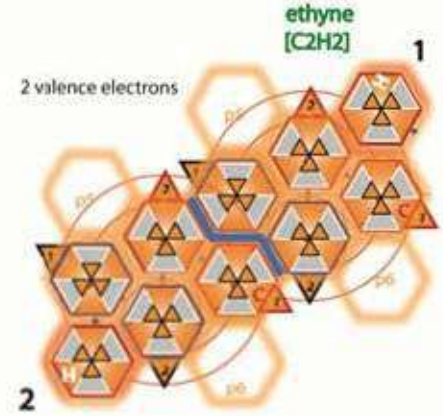
ethane [C2H6]



ethene [C2H4]



ethyne [C2H2]



Valance electrons also play an important role in determining the strength of chemical bonds

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Van der Waals Forces

Van der Waals forces include attractions between atoms, molecules, and surfaces. They differ from covalent and ionic bonding in that they are caused by correlations in the fluctuating polarizations of nearby particles

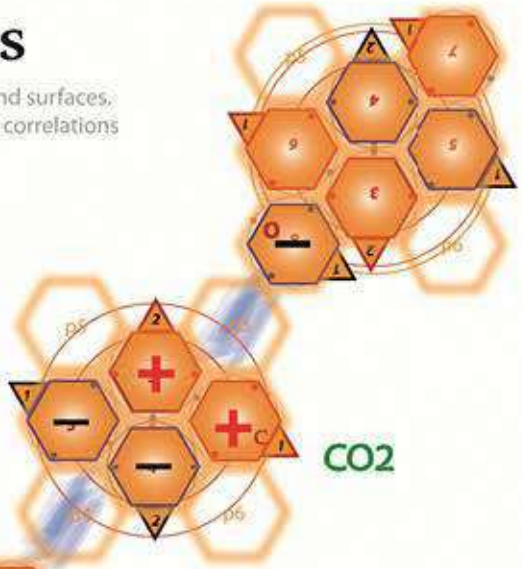
All charges seek equilibrium

The Forces of interaction can be attractive or repulsive

O=C=O

116.3 pm

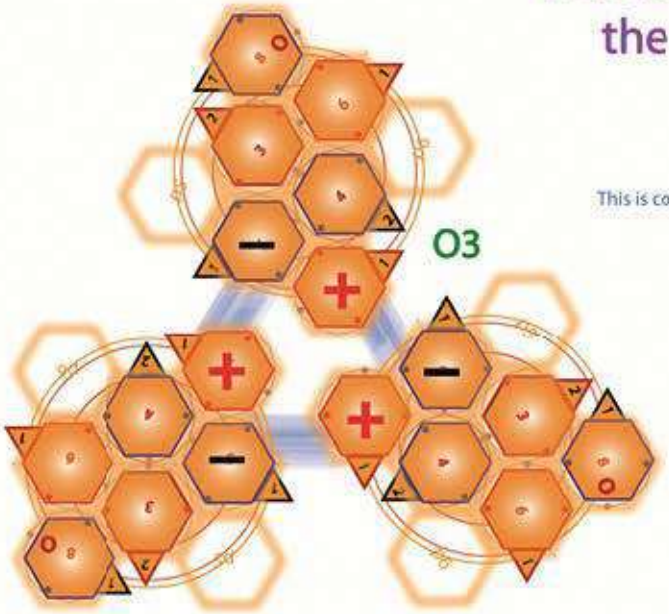
Van der Walls and London forces are the geometric fields of interaction between charged Matter topologies

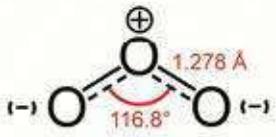


Resulting in the creation of larger-scale chemical compounds and molecules

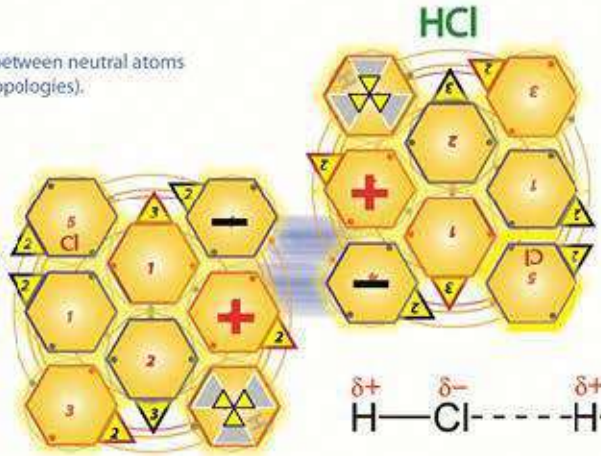
Residual interactive bonding force between the charged fascia of atoms

This is considered to be the only attractive intermolecular force present between neutral atoms (e.g., a noble gas configurations and charge neutral atomic topologies).





Without London forces, there would be no attractive force between noble gas atoms, and they wouldn't exist in liquid form.



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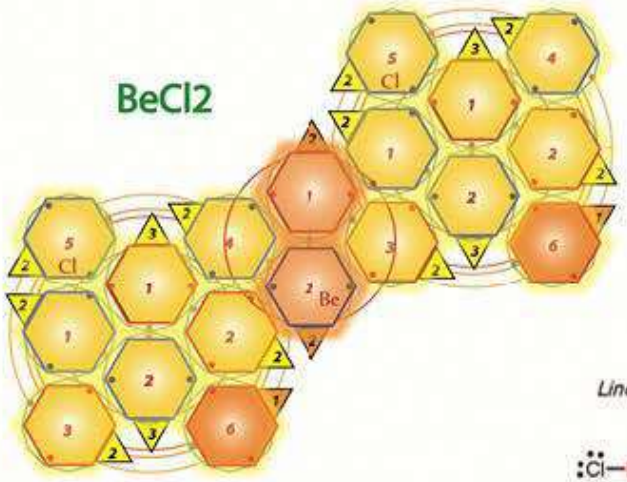
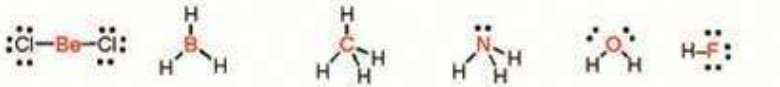
Lewis Structures

The Lewis structure was named after Gilbert N. Lewis, who introduced it in his 1916 article The Atom and the Molecule.

Lewis structures, also called Lewis-dot diagrams, are diagrams that show the bonding between the atoms of any molecule, and the lone pairs of electrons that may exist in the molecule.



Line drawings can be used to depict molecular geometry:



Beryllium dichloride	Borane	Methane	Ammonia	Water	Hydrofluoric acid
$BeCl_2$	BH_3	CH_4	NH_3	H_2O	HF
linear	*trigonal planar*	*tetrahedral*	*trigonal pyrimidal*	*bent*	*linear*

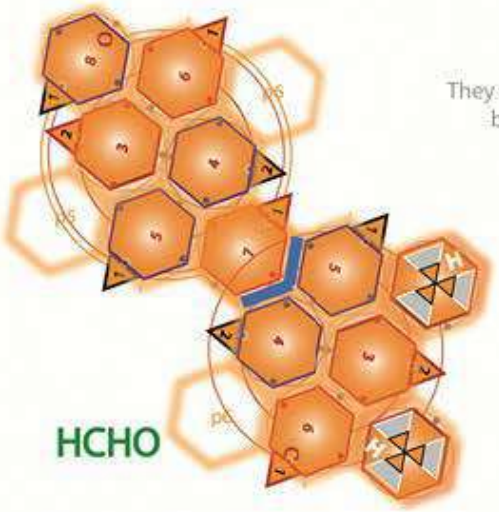
Also applies to molecules with multiple bonding:

methanal (formaldehyde)	Carbon dioxide	ethyne (acetylene)	ethane (ethylene)
trigonal planar	*linear*	*linear*	*both carbons are trigonal planar*

Hydrogen is a 'free radical' atom whose energy can be changed to facilitate chemical bonding between elements

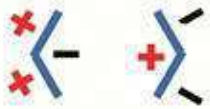
Tetryonic geometry uses the charged geometry of the element fascia themselves to show the bonds and charge interactions between differing elements as they form larger compounds as well as the actual final quantum topology of compound elements and molecules

They are similar to electron dot diagrams in that the valence electrons in lone pairs are represented as dots, but they also contain lines to represent shared pairs in a chemical bond (single, double, triple, etc.).



single fascia bond

double fascia bonds



triple fascia bond

it is the electric field fascia of baryons that facilitates chemical bonds

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Atomic bonds

All atoms, elements and compounds seek stable core energy & configurations where their electron orbitals are filled

Hydrogen σ bonds

Outward presenting electic fascia bonds
Facilitate bonding between molecules

Molecular π bonds

Inward recieving bonds
capable of accepting Hydrogen
or extra-orbital elctric fascia bonds

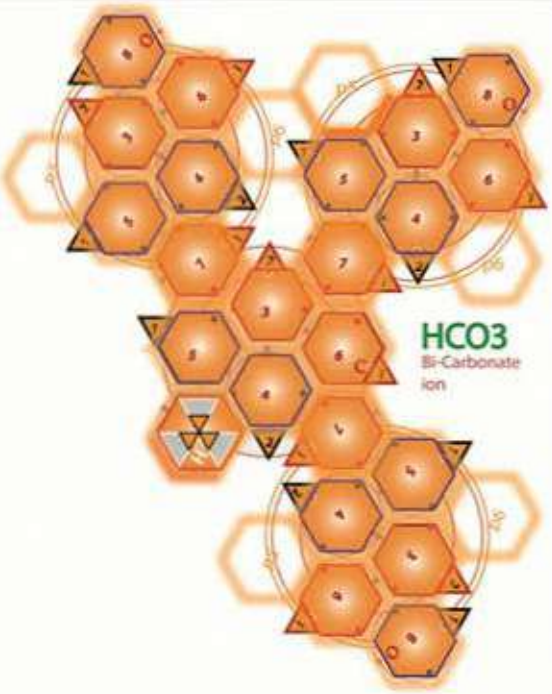
Bonds fill in order of orbital filling
ie p1-6, d1-10

OH

Hydroxide bonds

Oxygen-Hydrogen compound
creates a halogen-like topology
which seeks to fill its p6 orbital
in order to reach a stable electronic
configuration

Extremely reactive



HCO3

Bi-Carbonate
ion

NO3

Nitrate
ion

Nitrate and Carbonate Ions

have equivalent electron
configurations (isoelectronic)

Core electron configuration

Unreactive (non-valence)
electron configuration

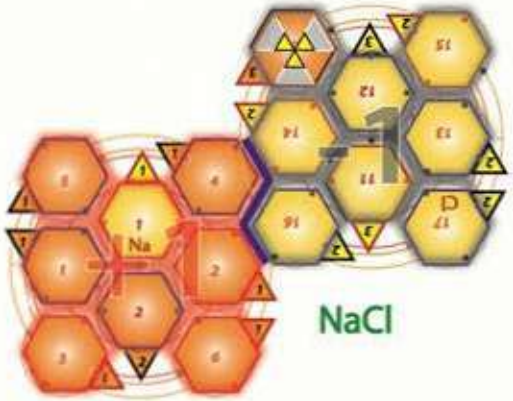
CH4

Covalent bonds

Intra-orbital bonding between
elements and compounds where
electrons exchange is the main
mechanism resulting in
stable electronic configurations

Ionic bonds

Extra-orbital bonding between
elements and compounds where
element charge attraction is the
predominent mechanism
with electrons sharing resulting in
stable electronic configurations



NaCl

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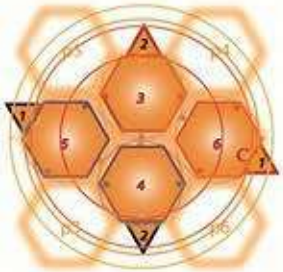
Atomic bonds

All atoms, elements and compounds seek stable core electron configurations where their electron orbitals are filled

Hydrogen Bonds

Outward presenting electic fascia bonds
Facilitate bonding between molecules



Molecular bonds

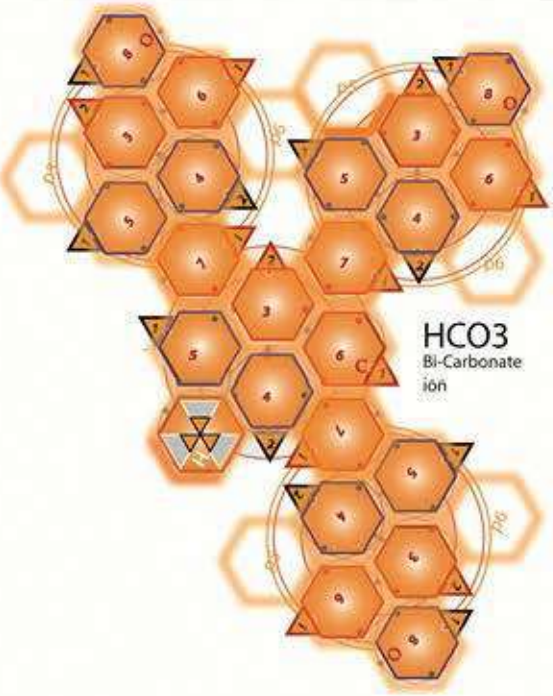
Inward recieving bonds
capable of accepting Hydrogen
or extra-orbital elctric fascia bonds

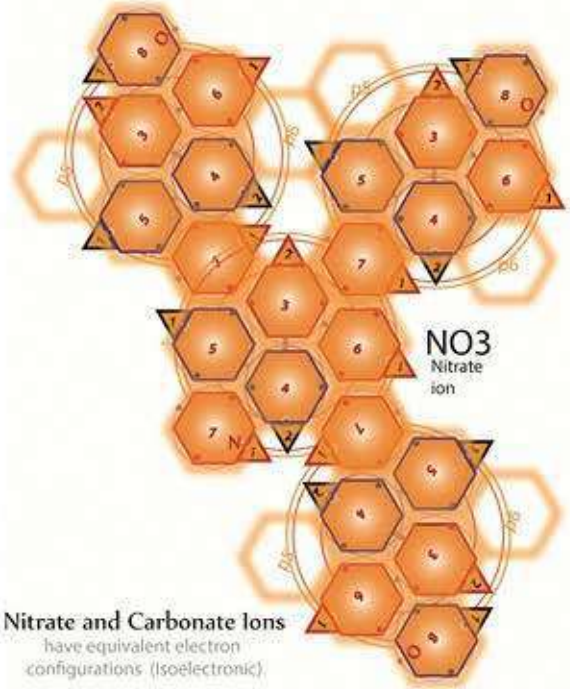
Bonds fill in order of orbital filling
ie p1-6, d1-10

Hydroxide bonds

Oxygen-Hydrogen compound
creates a halogen-like geometry
which seeks to fill its p6 orbital
in order to reach a stable electronic
configuration

Extremely reactive





Nitrate and Carbonate Ions

have equivalent electron
configurations (Isoelectronic)

Core electron configuration

Unreactive (non-valence)
electron configuration

Covalent bonds

Intra-orbital bonding between
elements and compounds where
electrons exchange is the main
mechanisism resulting in
stable electronic configurations

Ionic bonds

Extra-orbital bonding between
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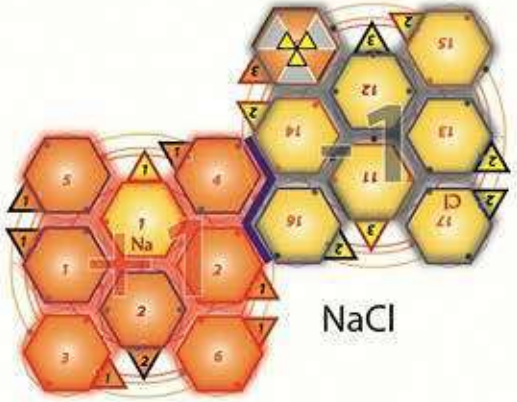

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[He] 2s2 2p6
2

CORE ELECTRON configurations

L
M
N
O
P
Q

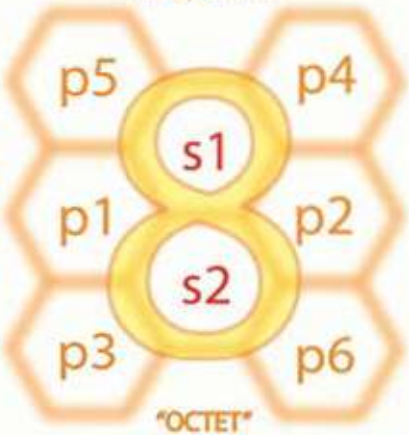
	1s2 2s2 2p6	[He]
	1s2 2s2 2p6 3s2 3p6	[Ne]
	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6	[Ar]
	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 5s2 5p6	[Kr]
	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 4f14 5s2 5p6 5d10 6s2 6p6	[Xe]
	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 4f14 5s2 5p6 5d10 5f14 6s2 6p6 6d10 7s2 7p6	[Rn]
		[Uuo]

The term "core electrons" or "noble gas core" refers to the electrons within the atom which have the same electron configuration as the nearest noble gas of lower atomic number and contain filled s&p orbitals

[Ne] 3s2 3p6
10

[Ar] 3d10 4s2 4p6
18

'Nobel Gas' configuration
full s,p orbitals



'core electron' configurations are present in energy levels L [2] - [7] Q

electrons not in filled or complete atomic orbitals are valence electrons

"OCTET"
No valance

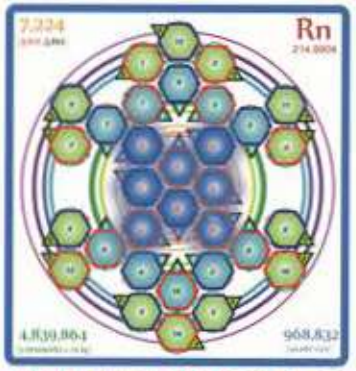
Using core electron notation greatly reduces complexity of the electron configuration notations of larger elements in the periodic table

[Ub] 1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 5s2 4d10 5p6 4f14 5d10 6s2 6p6 5f14 6d10 7s2 7p6 8s2
120
2 8 18 32 32 18 8 2

They are the electrons in the inner part of the atom that are not valence electrons and therefore do not participate in bonding

[Uuo] 8s2
118

[Kr] 4d10 5s2 5p6
36



[Xe] 4f14 5d10 6s2 6p6
54

[Rn] 5f14 6d10 7s2 7p6
86

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Core electron configurations

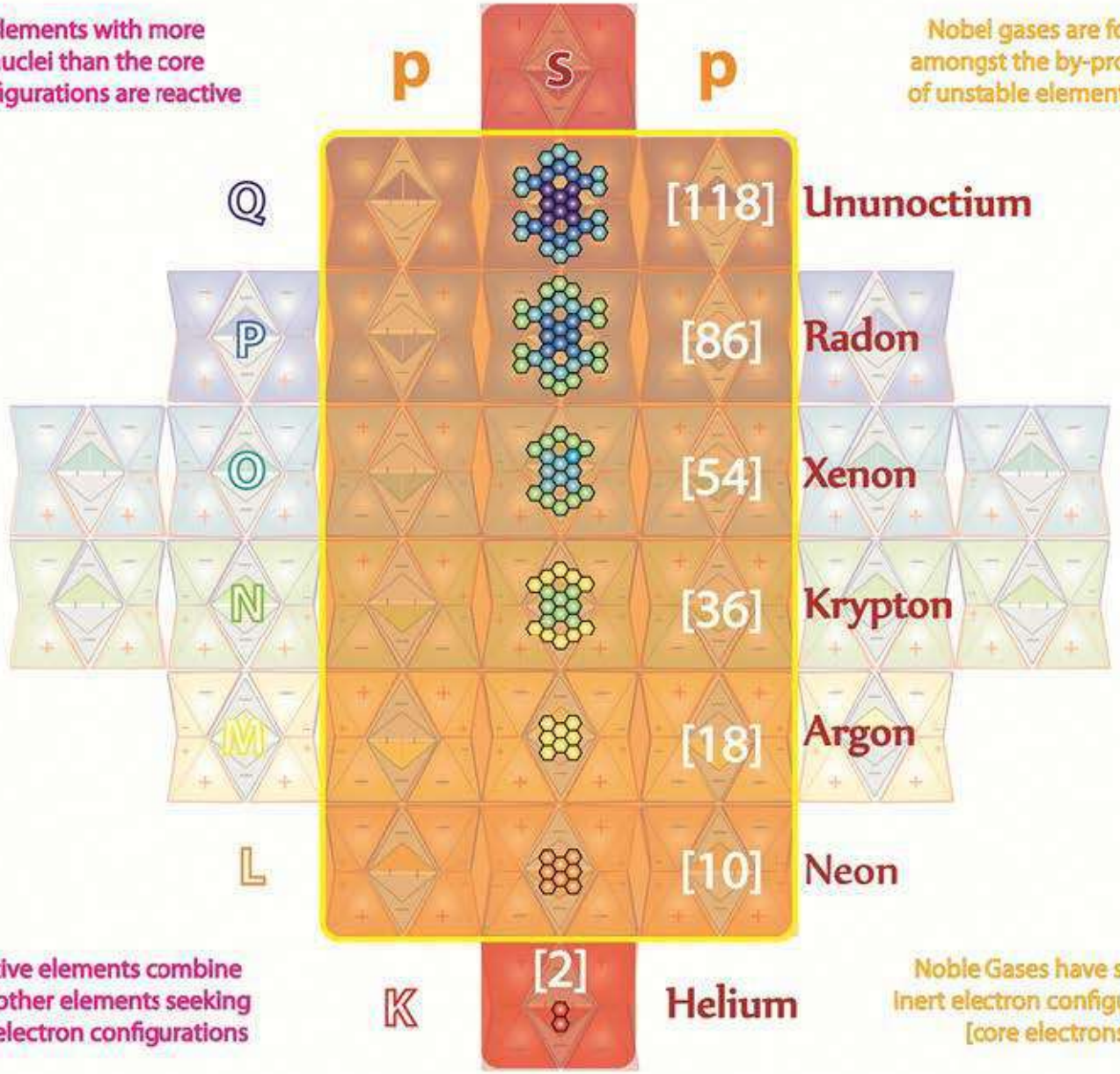
Core electrons are the electrons in an atom that are not valence electrons and therefore do not participate in bonding.

Reactive

Inert

Elements with more nuclei than the core configurations are reactive

Nobel gases are found amongst the by-products of unstable element decay



Reactive elements combine with other elements seeking core electron configurations

Noble Gases have stable inert electron configurations [core electrons]

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Helium is a unique noble gas in that it only has filled s-orbitals

suggesting that it be more appropriate to designate it as an alkaline earth gas

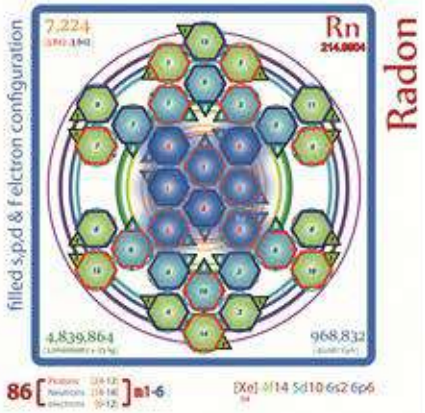
Nobel gases all have inert core sp electron configurations

The Nobel Gases

are nuclei whose electron orbitals are completely filled
(and consequently have no valence electrons for bonding)

2		[He]
10	1s2 2s2 2p6	[Ne]
18	1s2 2s2 2p6 3s2 3p6	[Ar]
36	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6	[Kr]
54	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 5s2 5p6	[Xe]
86	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 4f14 5s2 5p6 5d10 6s2 6p6	[Rn]
118	1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 4d10 4f14 5s2 5p6 5d10 5f14 6s2 6p6 6d10 7s2 7p6	[Uuo]

All nobel gases have filled electron orbitals creating inert, chemically un-reactive elements



The noble gases are a group of chemical elements with very similar properties: under standard conditions, they are all odorless, colorless, monatomic gases, with a very low chemical reactivity.

Whilst some of the nobel gases are often termed core electron configurations the large elements also have filled d & f orbitals in them

The six noble gases that occur naturally are Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe), and the radioactive noble gases are Radon (Rn) and Ununioctium (Uuo).

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Molecular Bonds

Hydrogen bonds

A weak, primarily electrostatic, bond between a hydrogen atom bound to a highly electronegative element in a given molecule and a second highly electronegative atom in another molecule

Diatomic bonds are fascia interactions between molecules with the same nuclei number
[O2, F2, I2, Cl2]

Sigma bonds

The residual EM force between opposite charge fascia in nuclei holds individual nuclei together in turn resulting in larger molecules and compounds

Pi bonds

residual Strong Force

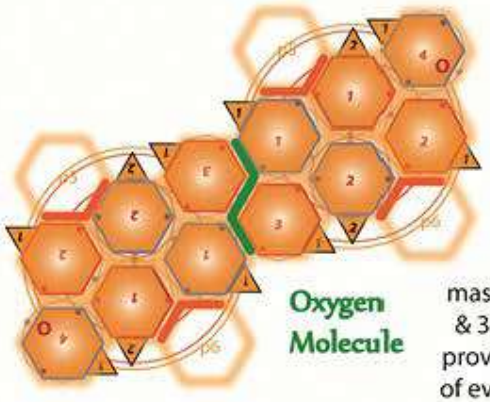
internalised EM charges

Molecular bonds

external s&p fascia interaction

Stable inert Nobel gas config

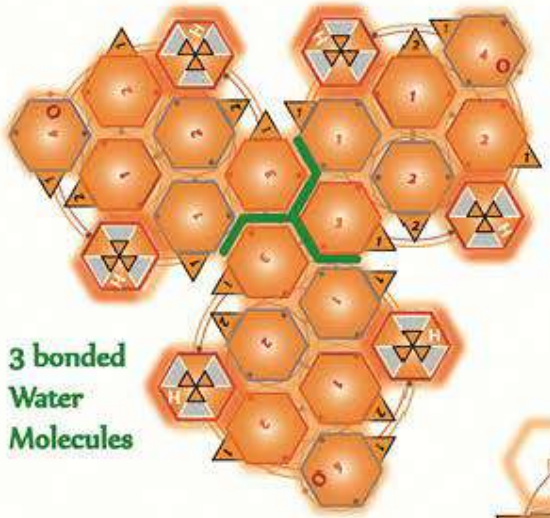
A molecular bond is an attractive force between nuclei that allows two or more elements or atoms to combine into a singular, complex compound structure



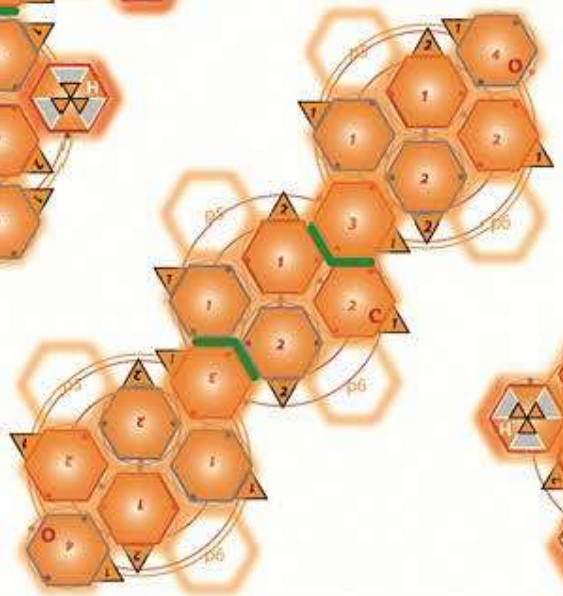
Oxygen Molecule

Tetryonic mass-energy geometries & 3D Matter topologies provide for the modelling of even the most complex chemical bonding arrangements

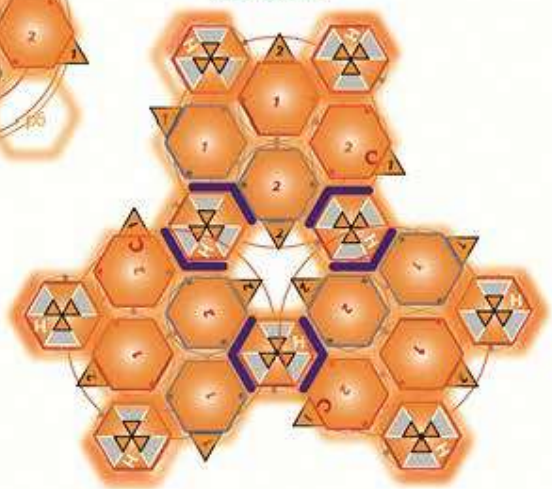
Hydrogen Sulfate Molecule



3 bonded Water Molecules



Carbon Dioxide Molecule



Trishexane Molecule

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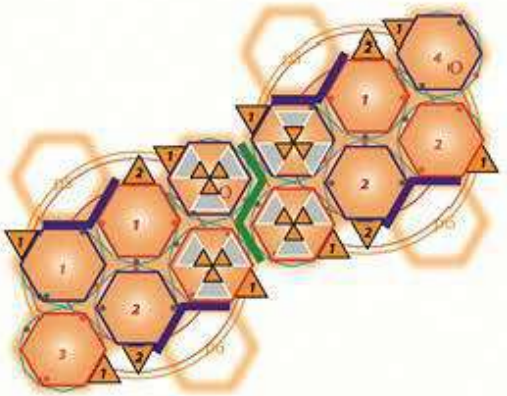
Covalent bonds are chemical links between two atoms in which electrons are shared between them.

Sigma bonds are covalent bonds formed by direct overlapping of two adjacent atom's outermost orbitals.

A pi bond is a covalent bond formed between two neighboring atom's unbonded p-orbitals.



Double and triple bonds between atoms are usually made up of a single sigma bond and one or two pi bonds

π—σ—π

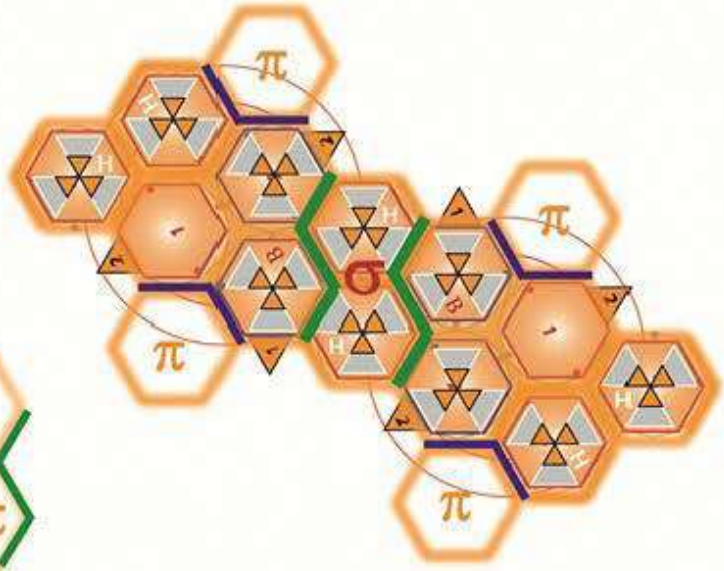
Note: sigma bonds can be formed by the bonding of either s-orbitals [or two adjacent p-orbitals]

Lewis electron dot diagrams fail to illustrate reality in that molecules exist as 3D objects and not as a two dimensional systems as shown by them.

Tetryonic geometry & topologies provide a polar view of 3D atomic nuclei that can be viewed as an exact representation of what a molecule & its bonds would look like when viewed from above.

Sigma & Pi covalent bonds

The single electrons from each atom's p orbital combine to form an electron pair creating the sigma bond.



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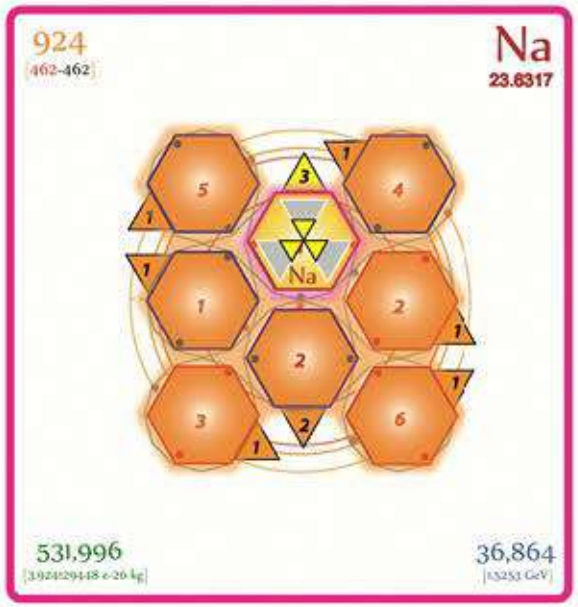
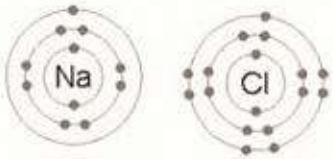
Alkali Metals





Valence electrons

are the highest energy electrons in an atom forming the outermost electrons of an atom, and are important in determining how the atom reacts chemically with other atoms

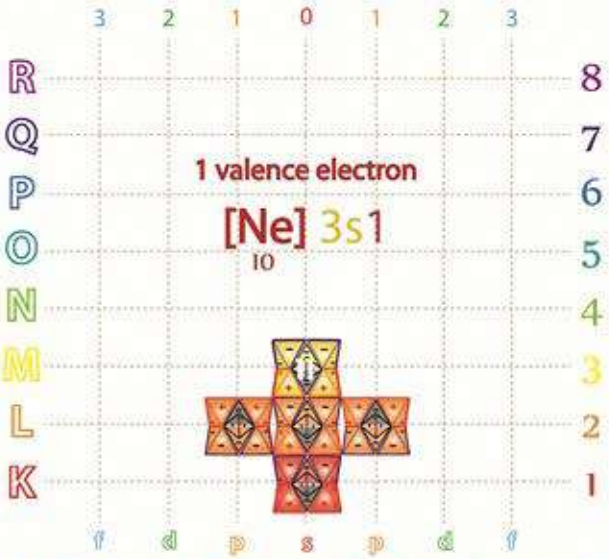
Historically, the number of valence electrons was reflected by the element's group number in the Mendeleev table and formed the basis of elemental families

Tetryonic topologies now replace the older, incorrect models of valence electron configurations with the full 3D modelling of all atoms, elements & compounds

[zz] are core electron configurations

providing a superior visual means of accurately determining the energies and position of any electron in chemical compounds and determining the valence numbers

Halogens



Atoms with more electrons than a closed shell are also highly reactive, as the extra valence electrons are easily removed from that orbital (to form a positive ion)

Atoms one or two valence electrons short of a closed shell are highly reactive, due to their tendency to seek to gain the missing valence electrons (thereby forming a negative ion)

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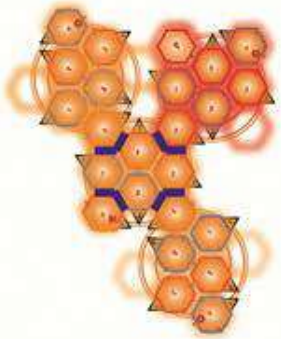
Common Acids

Hydro-Chloric acid

HCl

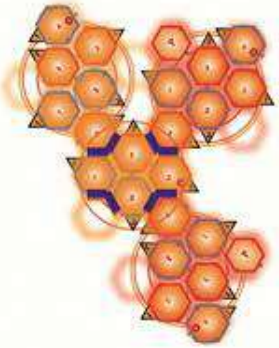
HNO3

Nitric acid



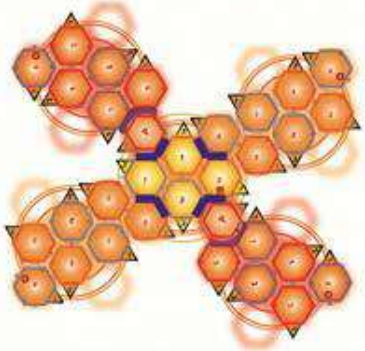
Carbonic acid

H2CO3



H2SO4

Sulfuric acid



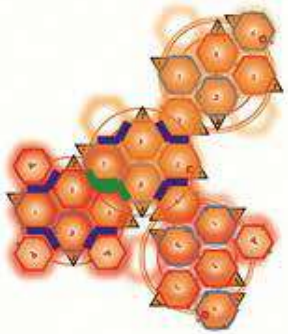
The Arrhenius definition defines acids as substances which increase the concentration of hydrogen ions (H+), or more accurately, hydronium ions (H3O+), when dissolved in water.

The Brønsted-Lowry definition is the most widely used definition where acid-base reactions are assumed to involve the transfer of a proton (H+) from an acid to a base.

A Lewis acid is a substance that can accept a pair of electrons to form a covalent bond.

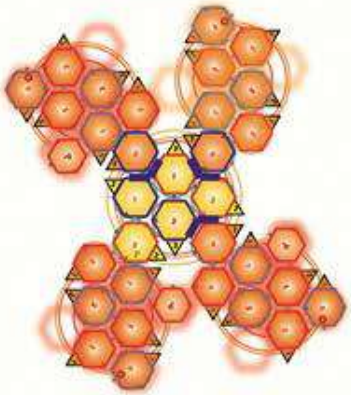
HC2H3O2

Acetic acid



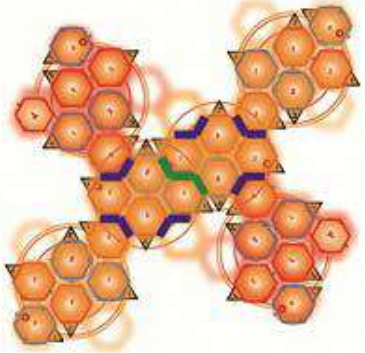
Phosphoric acid

H3PO4



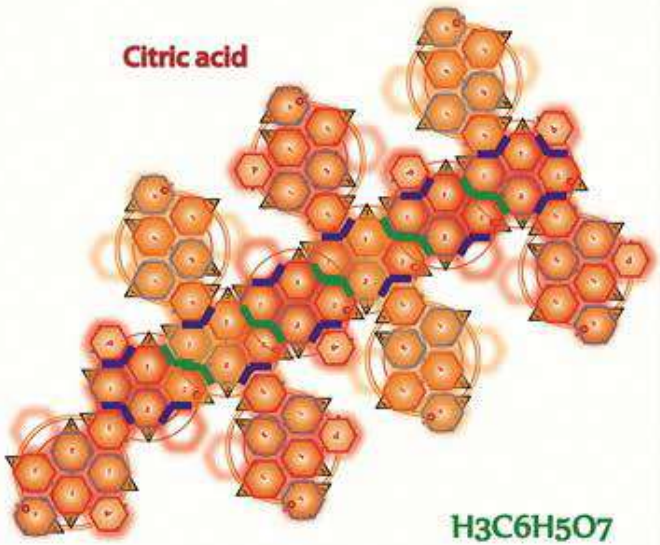
H2C2O4

Oxalic acid



Citric acid

H3C6H5O7



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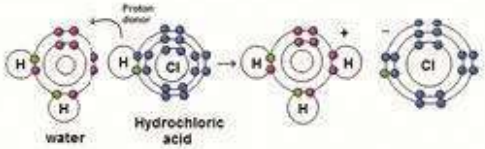
Chemical reactions

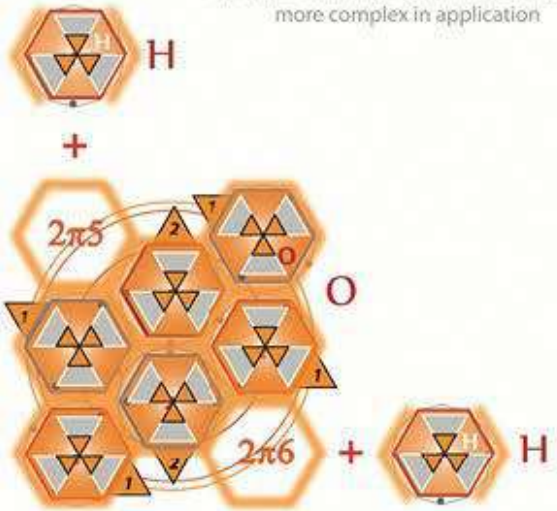
Valence Bonds & Molecular orbitals

A chemical reaction is a process that leads to the transformation of one set of chemical substances to another.

Valence bond theory focuses on how the atomic orbitals of the dissociated atoms combine in molecular formations to give rise to individual chemical bonds.

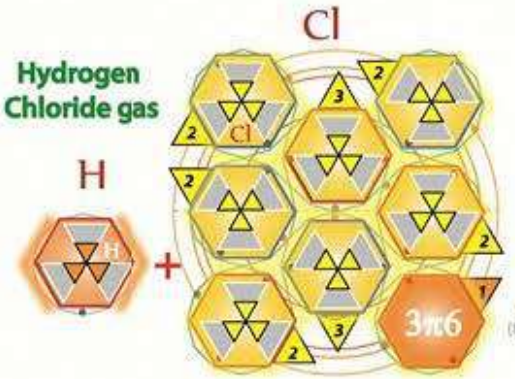


In contrast, molecular orbital theory has orbitals that are designed to cover the whole molecule but is mathematically more complex in application



6 valence electrons
2 [n2] valence bonds available
(8 electron stable configuration)

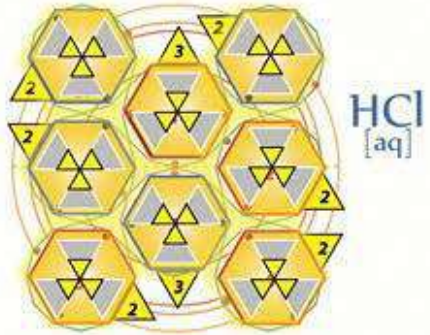
Hydrogen Chloride gas



7 valence electrons
1 [n3] valence bond available
(8 electron stable configuration)

In order to form Hydro-chloric acid [HCl aq] and bond with similar water [H2O] molecules, the n2 Hydrogen atom's energy must be raised so it can migrate to the [3π6] orbital and bond

[n2] Hydrogen atom cannot bond in the [3π6] valence position so in HCl gas it forms a [n2] di-atomic bond instead and its electron migrates to the [nσ1] orbital



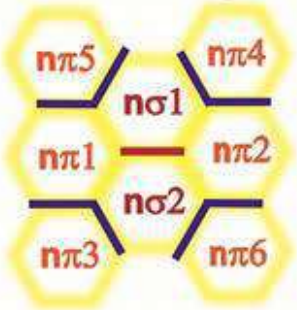
Hydrochloric acid

Hydronium

Aqueous
Hydro-Chloric acid solution

Tetryonic theory replaces both VB & MO theories by modelling the physical quantum charge topologies and rest mass-energy geometry of all elements and compounds

Valence configurations seek to create stable filled obital configurations



Building on exisiting electron configuration nomenclature tetryonic theory provides a new bonding schema for elements and complex compounds alike that is fully reflective of the physical quantum charge interactions

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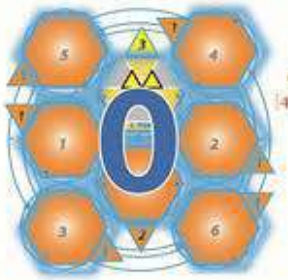
Ionic Bonding



Alkaline Metal

Sodium atom gives up an electron in order to create a stable [Ne] nobel gas configuration

Sodium atom develops into a nett POSITIVE charge ion

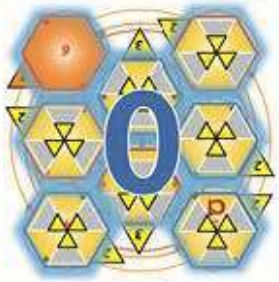
Resultant salt [NaCl] molecule has a NEUTRAL charge with the n3 electron migrating to fill the 3p6 orbital

Chlorine atom seeks an electron to order to create a stable [Ar] nobel gas configuration

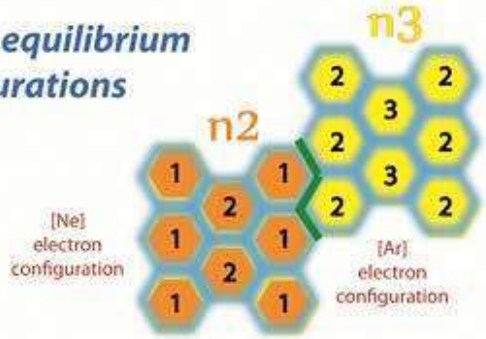
OPPOSITES ATTRACT

Chlorine atom develops into a nett NEGATIVE charge ion

Halogen



All atoms and molecules seek equilibrium via stable electron configurations



In short, it is a bond formed by the attraction between two oppositely charged ions.

An ionic bond (or electrovalent bond) is a type of chemical bond that can often form between metal and non-metal ions (or polyatomic ions such as ammonium) through electrostatic attraction.

The metal donates one or more electrons, forming a positively charged ion or cation with a stable electron configuration.
These electrons then enter the non metal, causing it to form a negatively charged ion or anion which also has a stable electron configuration.
The electrostatic attraction between the oppositely charged ions causes them to come together and form a bond.

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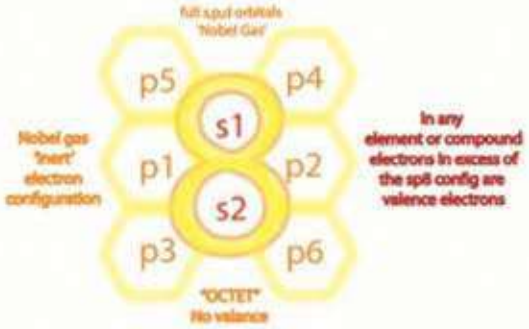
Valence electron rules



sp8 - core electron orbital grouping

Tetryonic quantum charge topologies provide the complete picture

Valence electrons are the highest quantum level electrons in elemental or compound atom nuclei in excess of the core sp8 'noble gas' electron configuration

They are located in the outer most shells (ie K-Q or Quantum 1-7) making them easily ionised from the elemental nuclei

s 1-2 (electron orbital pair)
p 1-2, 3-4, 5-6 (electron orbital pairs)
d 1-2, 3-4, 5-6, 7-8, 9-10 (electron orbital pairs)
f 1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 (electron orbital pairs)

Valance electron congigurations always include 's' orbital electrons due to their higher quantum levels

Developed from Lewis diagrams
Is usually only useful for elements Z<20

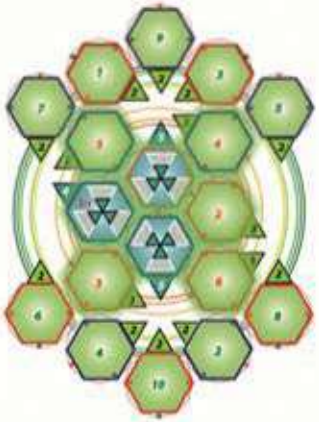
Neon
[He] 2s2, 2p6

Sodium
[Ne] 3s1
Valence - 1

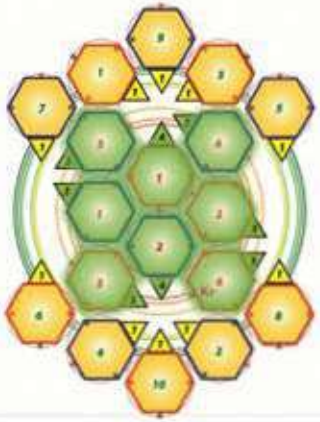
Scandium
[Ar] 3d1, 4s2
Valence - 3

Fluorine
[He] 2s2, 2p5
Valence - 7

Nickel
[Ar] 3d8, 4s2
Valence - 10

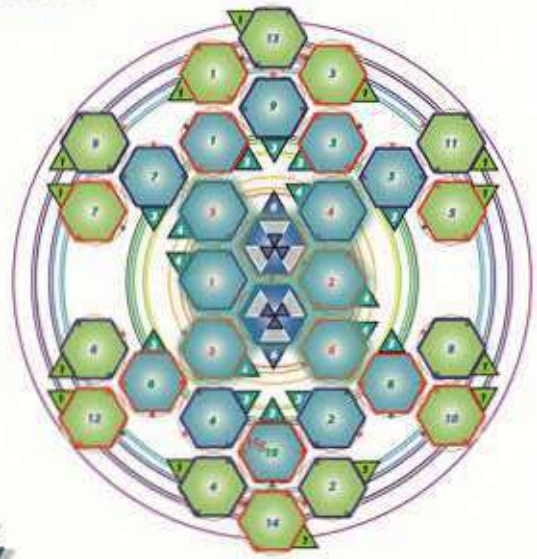


Indium
[Kr] 4d10, 5s2, 5p1
Valence - 3



Krypton
[Ar] 4s2, 4p6

Gold
[Xe] 4f14, 5d9, 6s2
Valence - 11



Mercury
[Xe] 4f14, 5d10, 6s2

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Filled electron orbitals

Once 8 valence electrons are reached a stable valence cofiguration is created

Once sub-orbit 8 (P7-8) is reached sequential valence numbering switches to paired valence numbering (as per orbital energies)

Valence numbers can be calculated by adding the 2 highest energy orbitals together (and subtracting 8 - if the total is higher than 8)

The octet rule is a simple chemical rule of thumb that states that atoms tend to combine in such a way that they each have eight electrons in their valence shells, giving them the same electronic configuration as a noble gas.

The rule is applicable to the main-group elements, especially carbon, nitrogen, oxygen, and the halogens, but also to metals such as sodium or magnesium. In simple terms, molecules or ions tend to be most stable when the outermost electron shells of their constituent atoms contain eight electrons.

In short, an element's valence shell is full and most stable when it contains eight electrons, corresponding to an s2p6 electron configuration.

CORE ELECTRONS

This stability is the reason that the noble gases are so unreactive, for example neon with electron configuration 1s2 2s2 2p6. (Helium is an exception as explained).

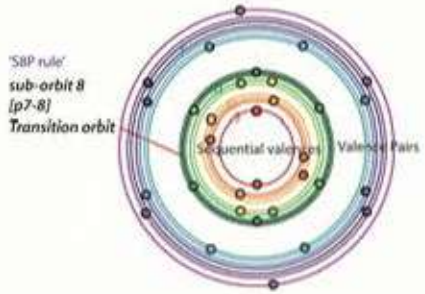
Note that a "full shell" means that there are the eight electrons in the valence shell when the next shell starts filling, even though higher subshells (d, f, etc.) have not been filled.

There can be at most eight valence electrons in a ground-state atom because p subshells are always followed by the s subshell of the next shell.

OCTET RULE

This means that once there are 8 valence electrons (when the p subshell is filled), the next additional electron goes into the next shell, which then becomes the valence shell.

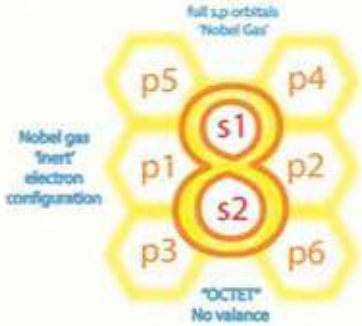
A consequence of the octet rule is that atoms generally react by gaining, losing, or sharing electrons in order to achieve a complete octet of valence electrons. Reaction of atoms occurs primarily in two ways: ionically and covalently.

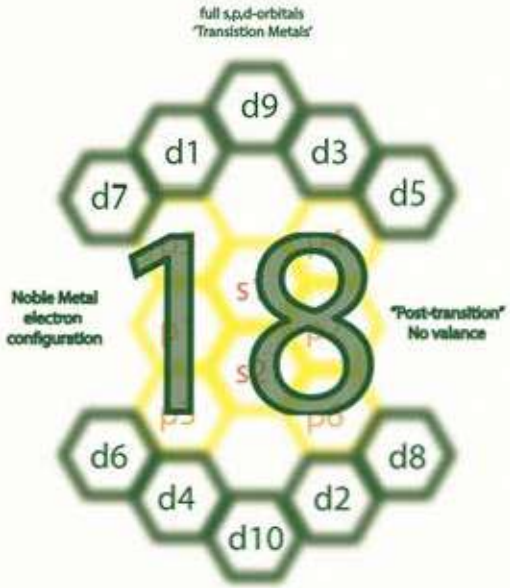


Once 8 valence electrons are reached the sub-orbits are stable and form a stable, non-reactive valence configuration.

Additionally, valence numbers proceed sequentially (1,2,3,4,5,6,7) up to sub-orbit 8 (P7-8) at which point all sub-orbit valences number in valence pairs (1-2, 3-4, 5-6, 7-8, 9-10, 11-2, 13-14)

The significance is that sub-orbit 8 is the middle sub-orbit (of 16 total sub-orbits possible)





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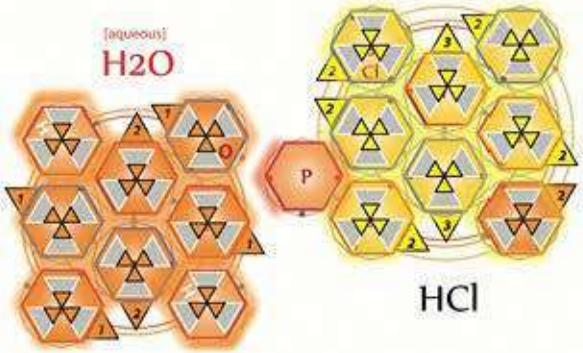
ACID

Hydrochloric acid is a clear, colourless solution of hydrogen chloride in water, it is a highly corrosive, strong mineral acid

Aqueous
Hydro-Chloric acid solution



The H(+) cation of the acid combines with the OH(-) anion of the base to form water.

all charges seek equilibrium

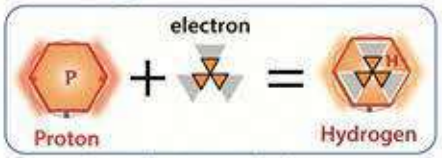
\+

When an acid and a base are placed together, they react to neutralize the acid and base properties, producing a salt.

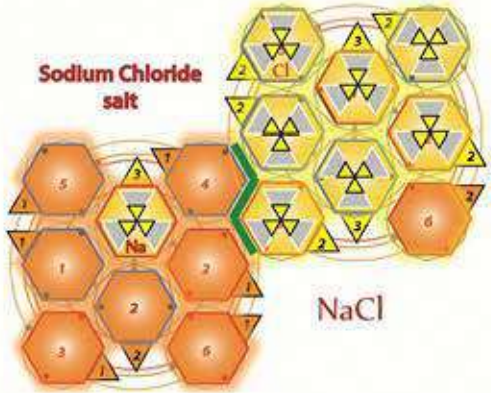
$$HCl(aq) + NaOH(aq) \longrightarrow NaCl(aq) + H_2O(l)$$

⇒

combining the free Protons & electrons



neutralises the ions and releases energy



The compound formed by the cation of the base and the anion of the acid is called a salt.

BASE

Sodium hydroxide, also known as caustic soda, or lye, has the molecular formula NaOH and is a highly caustic metallic base and alkali salt.

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Geometric Molecular Topology

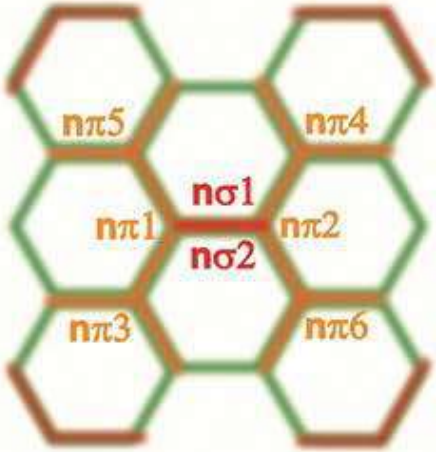
Molecules are most often held together with covalent bonds involving single, double, and/or triple bonds, where a "bond" is a pair of electrons shared between elements as they seek equilibrium (another method of bonding is ionic bonding and involves a positive cation and a negat ve anion).

Hydrogen

A Hydrogen bond is a chemical bond in which a hydrogen atom of one molecule is attracted to an electronegative atom, especially nitrogen, oxygen, or flourine atoms, usually of another molecule

The hydrogen bond is often described as an electrostatic dipole-dipole interaction.

However, it also has some features of covalent bonding: it is directional and strong, acting over interatomic distances shorter than that of van der Waals radii



Oxygen

The oxidation state of oxygen is −2 in almost all known compounds

Oxides of Oxygen & oxygen molecules are found throughout the range of Organic & inorganic compounds

All molecules seek KEM'ical charge and energy equilibrium

Geometric Molecular Topology is the overall arrangement of the atoms in a molecule, where the bonded atoms in a molecule are responsible for determining the final molecular topology of a chemical system of bonded elements.

As the numbers of atoms in molecules increases, the quantum molecular topology of a system grows increasingly complex and can only be modelled accurately using Tetryonic charged geometries

by bonding together and forming larger complex molecules

Common nitrogen functional groups include: amines, amides, nitro groups, imines, and enamines.

Molecular Octets

The concept of the Expanded Octet occurs in any system that has an atom with more than four electron pairs attached to it.

Most commonly, atoms will expand their octets to contain a total of five or six electron pairs, in total. In theory, it is possible to expand beyond those number.

The large amounts of negative charge concentrated in small volumes of space prevent those larger expanded octets from forming.

When an atom expands its octet, it does so by making use of empty d-orbitals that are available in the valence level of the atom doing the expanding.

The atom that expands its octet in a structure will usually be located in the center of the structure and the system will not use any multiple bonds in attaching atoms to the central atom.

Nitrogen

Carbon

Compounds of Carbon form the 'backbones' of Organic & inorganic compounds

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48
[24-24]

96
[48-48]

1 Proton
1 electron

48
[24-24]
Hydrogen

Hydrogen
48
[24-24]

84
[42-42]
Deuterium

Deuterium
84
[42-42]

168
[84-84]

2 Protons
2 Neutrons
2 electrons

bonds

Hydrogen is a
'free radical' atom

H2 has a smaller s-orbital
[lower energy level]
compared to Helium

Deuterium is the
building block of elements

H + H

e-
P+
Hydrogen
atom

e-
P+
Hydrogen
atom

Hydrogen atoms
form Covalent bonds

H_2

di-atomic
Hydrogen

Hydrogen

Hydrogen, bound mostly to carbon and nitrogen, is part of almost every molecule in your body: DNA, proteins, sugars, fats.
Hydrogen bonds - which form between atoms that "share" a hydrogen atom, is one of the most important interactions that makes biological molecules behave as they do.

0
[48-48]

0
[24-24]

0
[24-24]

2 Protons
2 electrons

Hydrogen bonds are sigma bonds

s1
σ
s2

note: n2 energy level Hydrogen is illustrative only
[Hydrogen bonds can be of any energy level]

0
[24-24]

0
[48-48]

2 Protons
2 electrons

0
[24-24]

H

The charged fascia of Baryonic quarks facilitates
chemical [hydrogen] bonding in molecules

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Carbon Compounds

504
[252-252]

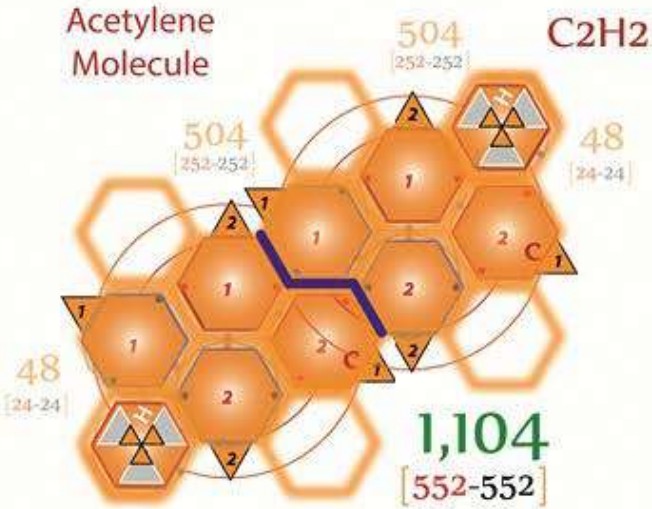
Carbon can bond in four places, and it can bond to itself so it's easy to make lots of different molecules.

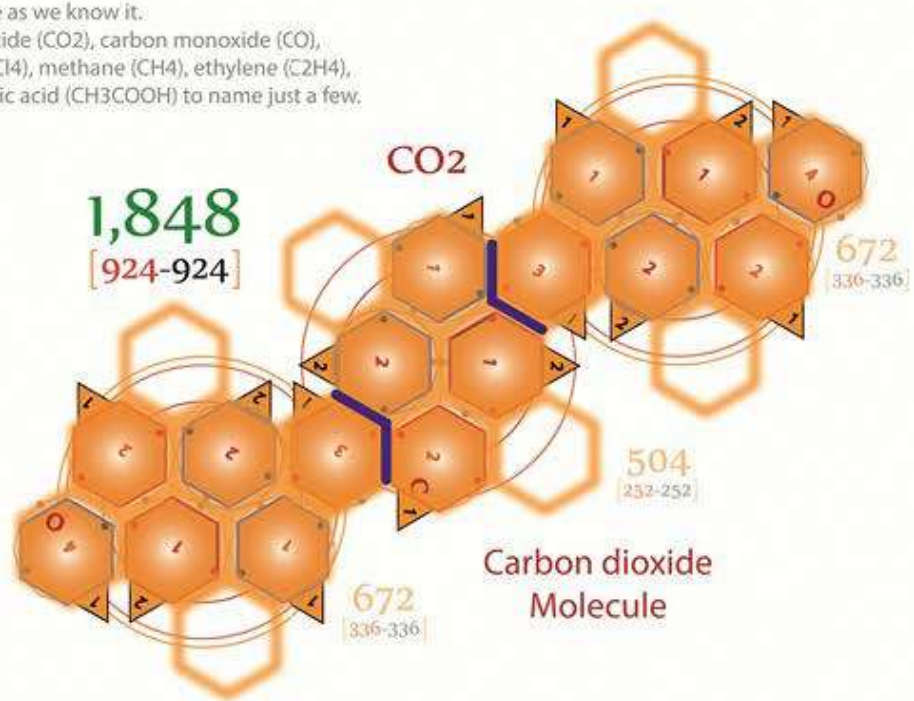
Carbon Monoxide Molecule

$[He]_2\ 2s2\ 2p2$

Many carbon compounds are essential for life as we know it.
Some of the most common carbon compounds are: carbon dioxide (CO2), carbon monoxide (CO), carbon disulfide (CS2), chloroform (CHCl3), carbon tetrachloride (CCl4), methane (CH4), ethylene (C2H4), acetylene (C2H2), benzene (C6H6), ethyl alcohol (C2H5OH) and acetic acid (CH3COOH) to name just a few.

Acetylene Molecule





Carbon dioxide Molecule

C

There are nearly ten million known carbon compounds and an entire branch of chemistry, known as organic chemistry, is devoted to their study.

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Nitrogen Compounds

N

588
[294-294]

672
[336-336]

NO

1,260
[630-630]

588
[294-294]

48
[24-24]

48
[24-24]

684
[342-342]

588
[294-294]

NH3

48
[24-24]

588
333.444
18,360

[He] 2s2 2p3
2

Nitrogen is a component of many biological molecules including proteins, lipids, nucleic acids, and carbohydrates. Nitrogen is so important that a shortage of nitrogen will inhibit the growth of an organism.

672
[336-336]

588
[294-294]

N2O

1,848
[924-924]

588
[294-294]

672
[336-336]

588
[294-294]

672
[336-336]

NO2

1,932
[966-966]

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Oxygen Compounds

672
[336-336]

H2O

48
[24-24]

768
[384-384]

672
[336-336]

48
[24-24]

672
[336-336]

O2

1,504
[252-252]

672
[336-336]

672
[336-336]

O

382.128

22.032

[He] 2s2 2p4
2

O3

672
[336-335]

2,016
[1,008-1,008]

672
[336-336]

672
[336-335]

SO2

672
[336-336]

2,688
[1,344-1,344]

1,344
[672-672]

672
[336-336]

Oxygen forms oxide compounds with almost all of the known elements

As soon as the oxygen enters your blood, a passing protein molecule called hemoglobin picks it up. Each molecule of hemoglobin can transport four molecules of oxygen to almost anywhere in the body.

The hemoglobin transport the oxygen to your cells where another protein, called cytochrome C oxidase makes two molecules of water out of every molecules of oxygen delivered to it

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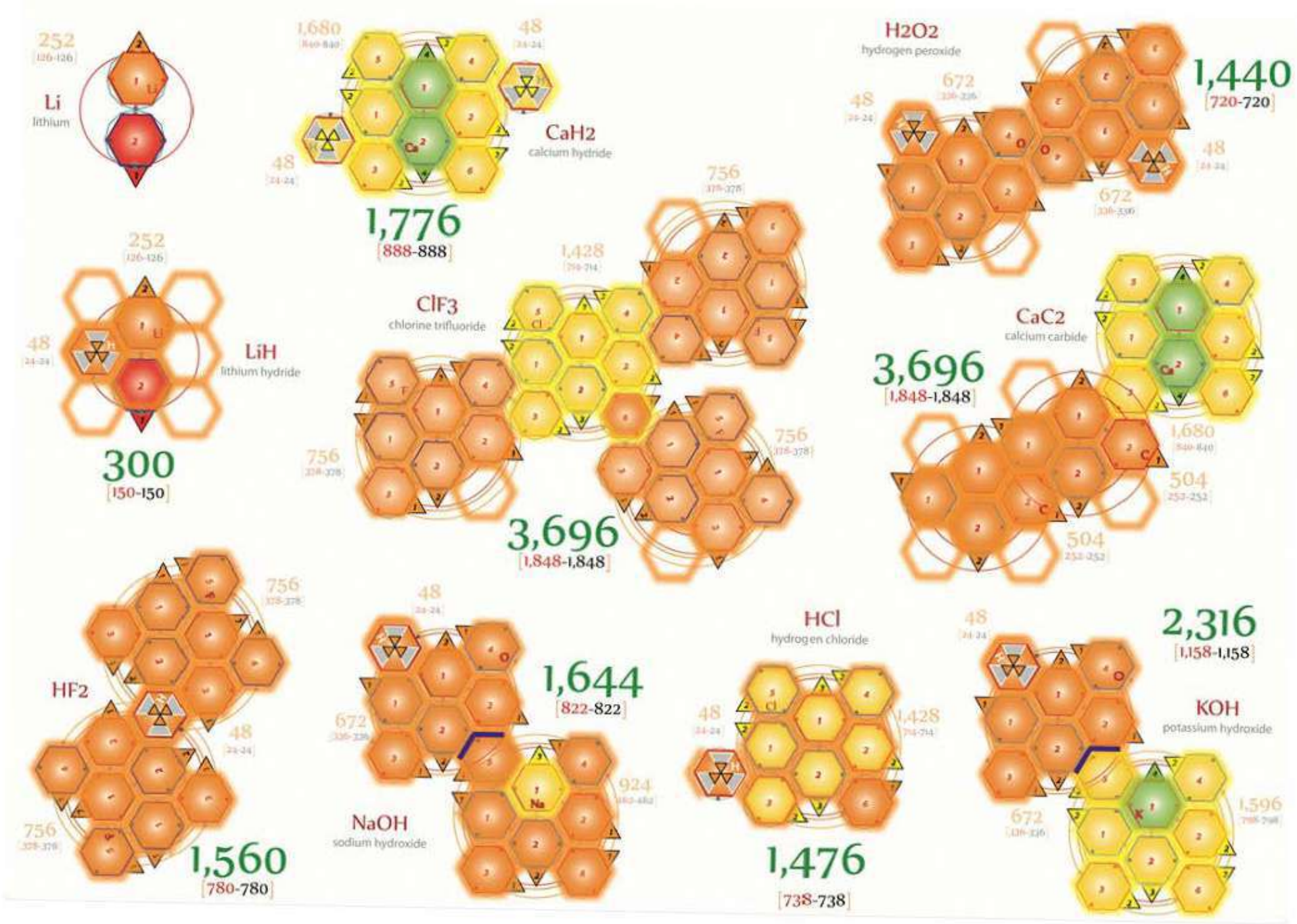

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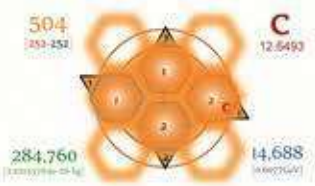
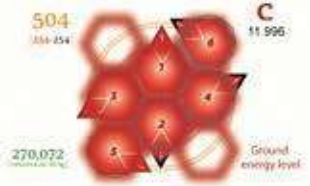


Chemistry

Is a branch of physical science, concerning the study of the composition, properties and behavior of Matter

Compounds containing bonds between carbon and a metal are called organometallic compounds.

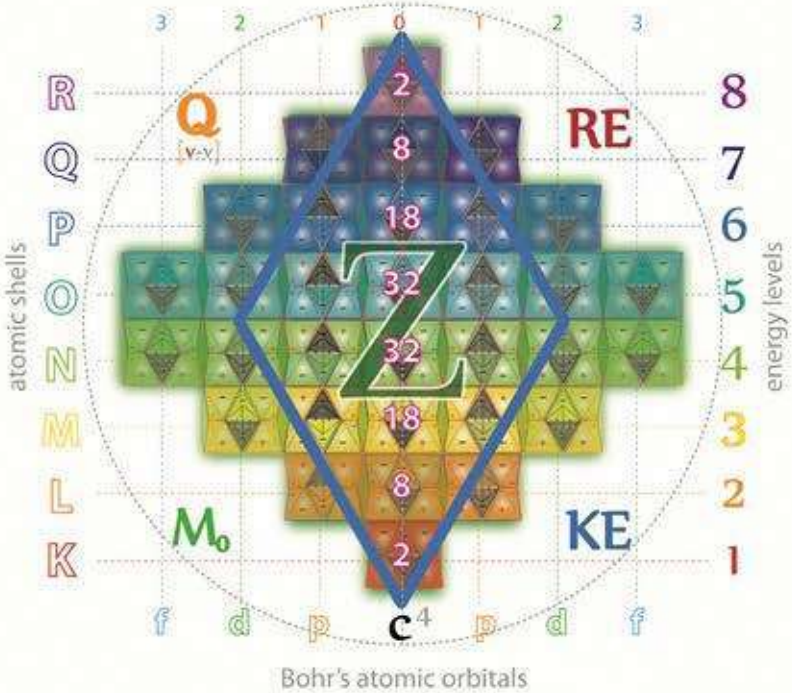


Inorganic compounds are produced by non-living natural processes or in the laboratory.

Inorganic compounds can form salts.

Inorganic compounds contain metal atoms.

Schrodinger's quantum numbers

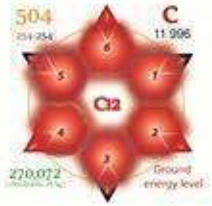


Bohr's atomic orbitals

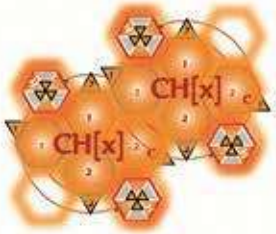
Organic compounds are produced by living things.

Organic compounds can't form salts.

Organic compounds contain carbon-hydrogen bonds.



Tetryonic theory unifies and expands upon the currently disjointed physical and chemical theories through the application of 2D equilateral charged mass-energy geometries in 3D standing-wave mass-Matter topologies



Inorganic

Typically the difference is defined as being whether or not a substance contains carbon or carbon-hydrogen bonds

Organic

A chemical compound is a collection of elements bonded together in a way that the resultant ions, atoms or molecules form a 3D material geometric structure. Tetryonic chemical geometries, along with its firm definition and distinction between EM mass & Matter provide a clear visual path for the differentiation between both branckes of modern chemistry - as well as the source of animation in living Matter

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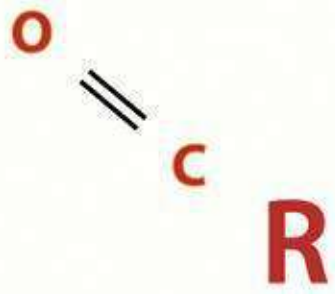
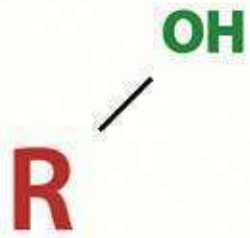
Functional Groups

A functional group is a reactive portion of a molecule.

carbonyl group

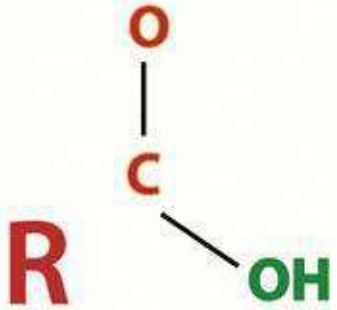


hydroxyl group



Organic molecules containing a hydroxyl group are known as alcohols.

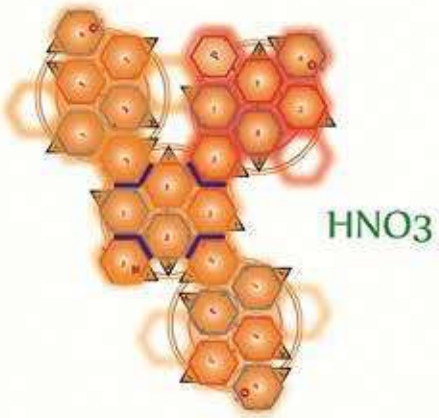
carboxyl group



The combinations of functional groups with hydrocarbons produce a vast number of compounds.

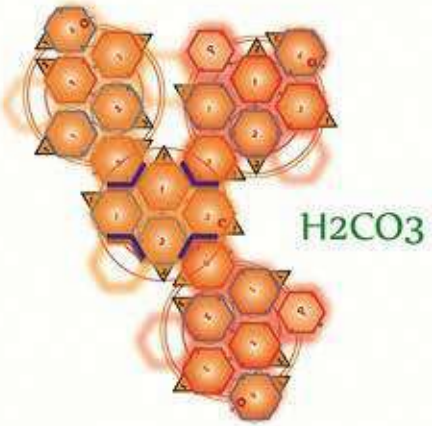
Carbon monoxide

carbonyl group is composed of a carbon atom double-bonded to an oxygen atom



Nitric acid

Carbonic acid



The carboxyl group is present in amino acids and carboxylic acids.

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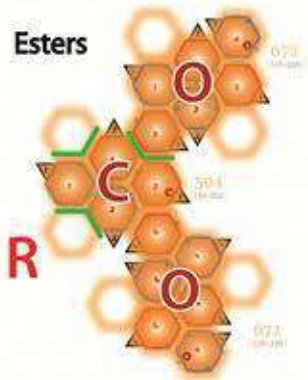
Derivatives of Hydrocarbons

An almost unlimited number of carbon compounds can be formed by the addition of a functional group to a hydrocarbon

Esters



Most esters have pleasant odors.
Esters are responsible for the fragrances of many flowers & the tastes of ripened fruits.

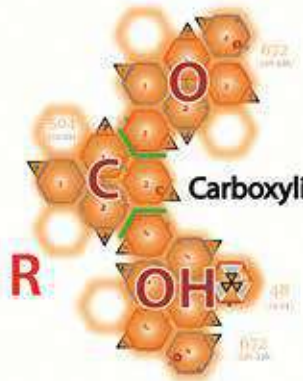
Ethers

The best known ether is diethyl ether.
It is a volatile, highly flammable liquid that was used as an anesthetic in the past.

Alkyl Halides - haloalkanes

Common alkyl halides include medical anesthetics, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs).

Carboxylic Acids



The simplest of the carboxylic acids is formic acid and is a constituent of bee stings and the bites of other insects including mosquitos.

Alcohols

Alcohols are organic compounds containing a hydroxyl group, [OH], substituted for a hydrogen atom. Ethanol is the alcohol in alcoholic beverages and it is also widely used as a solvent.

H
hydro

Aldehydes

An aldehyde is a compound containing a carbonyl group with at least one hydrogen attached to it. With a Hydrogen in place of the R group it forms Formaldehyde

C
carbons

Ketones

Acetone is the simplest of the ketones. Acetone is a commonly used solvent and is the active ingredient in nail polish remover and some paint thinners

Amines

Amines are organic compounds that contain nitrogen, they are basic compounds with strong odors, often described as "fishy"

Amides

Amides are nitrogen-containing organic compounds and are formed when amino acids react to form proteins.

"R's" stand for carbon substituents or hydrogen atoms.

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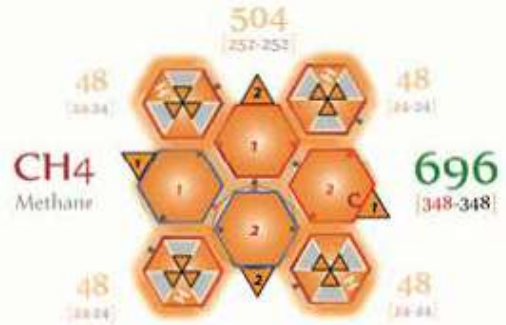
Hydrocarbons

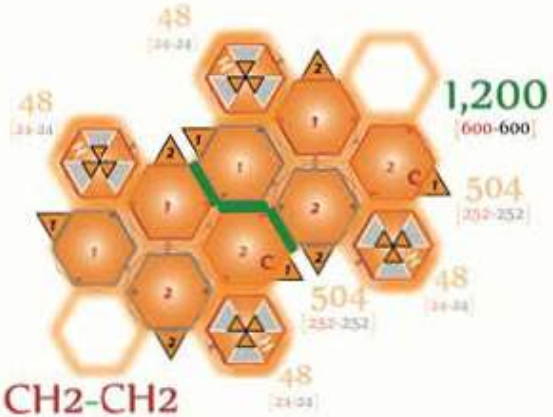
In organic chemistry, a methylene group is any part of a molecule that consists of two hydrogen atoms bound to a carbon atom, which is connected to the remainder of the molecule

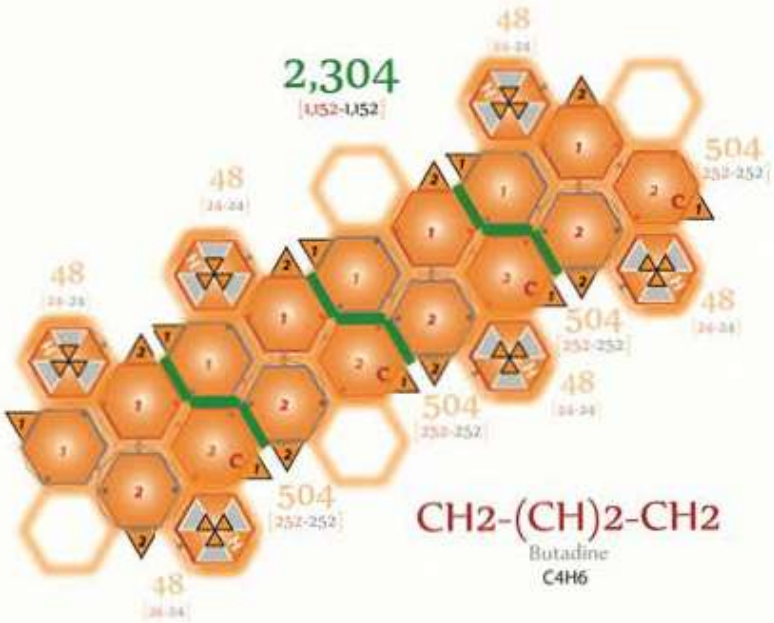
CH2
Methylene

The methylene group should be distinguished from the free methylene radical, also called carbene, whose molecule is a methylene group all by itself.

H2C
Carbene

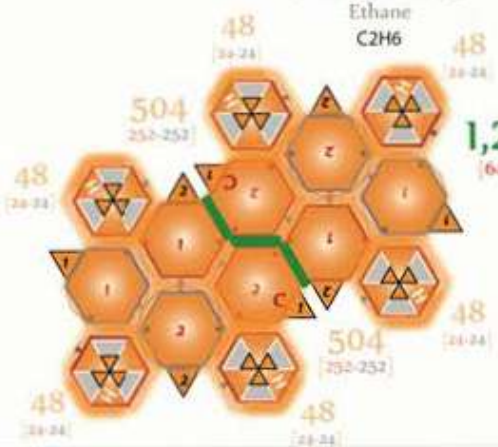






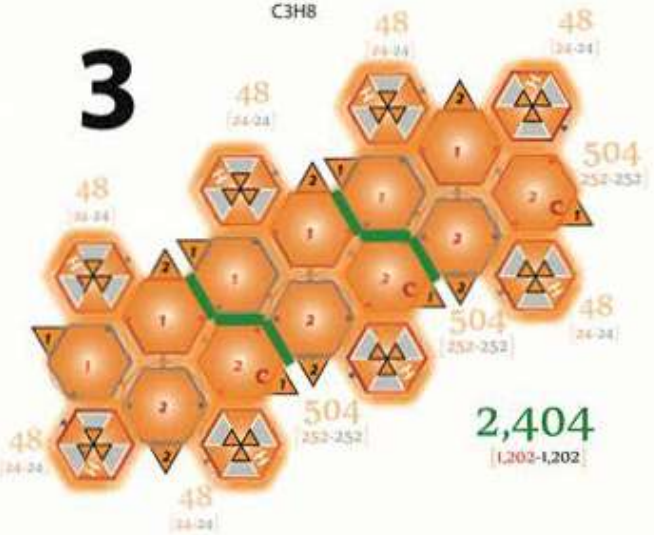
CH3-CH3
Ethane
C2H6

2



CH3-(CH2)-CH3
Propane
C3H8

3



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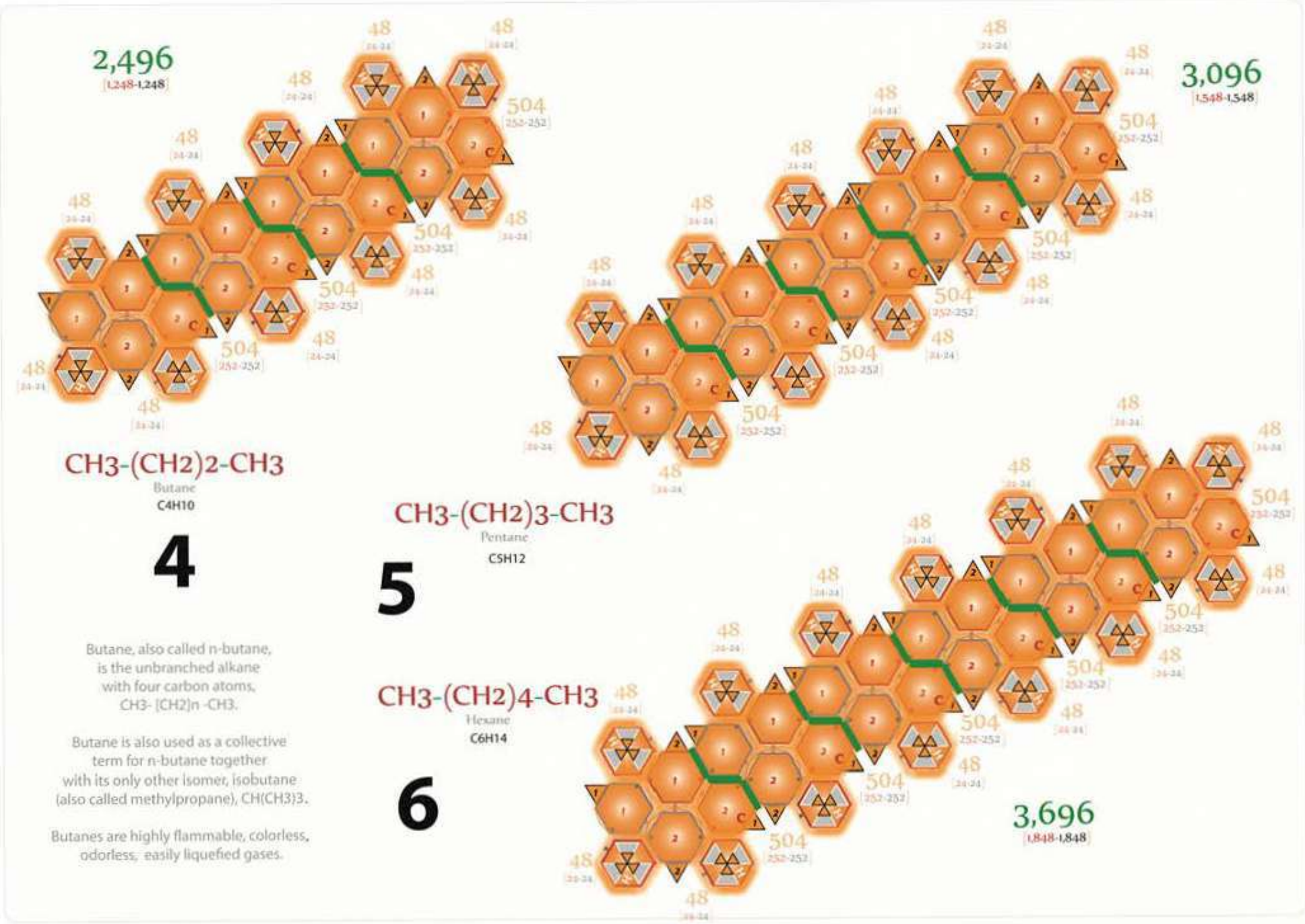

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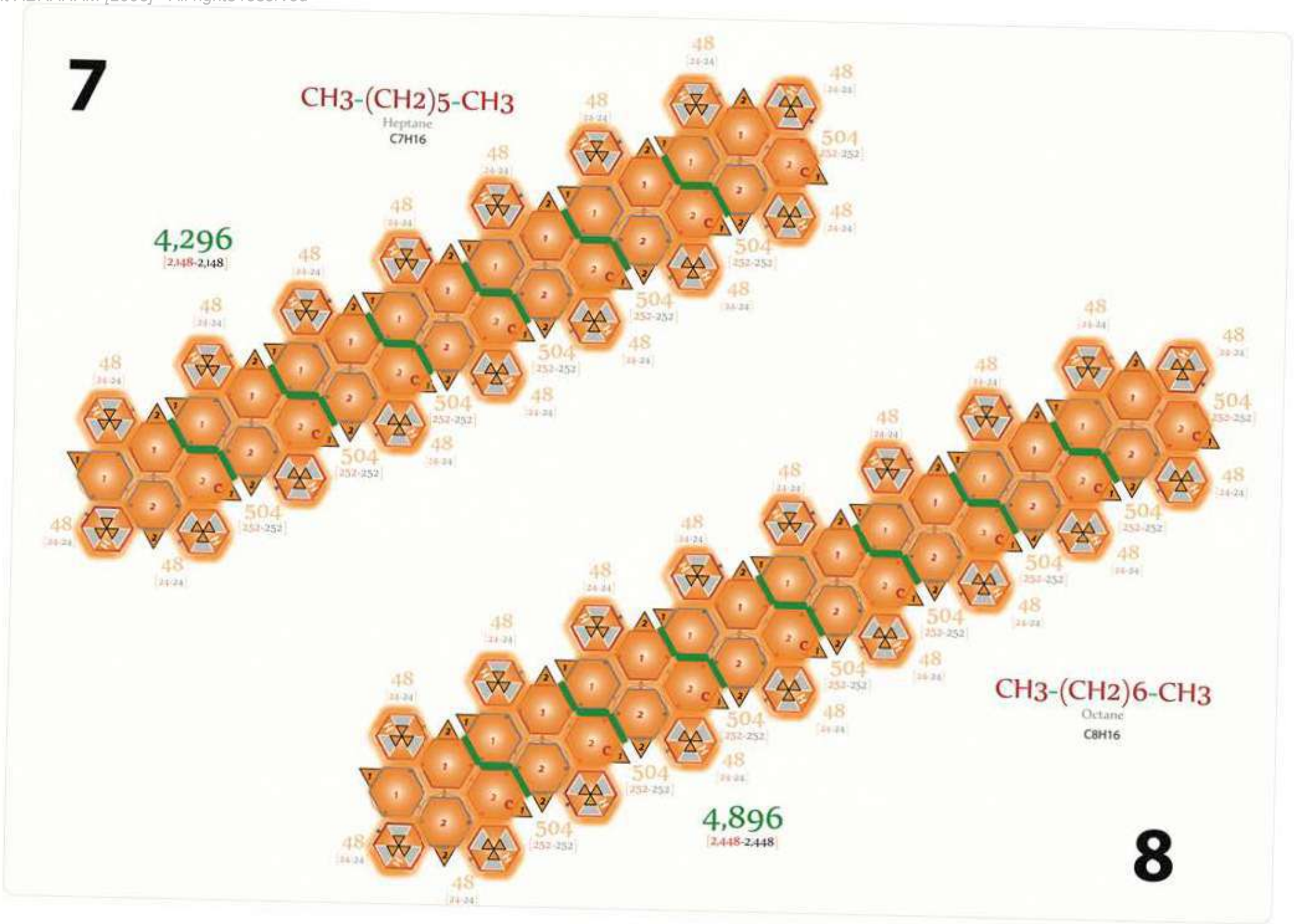

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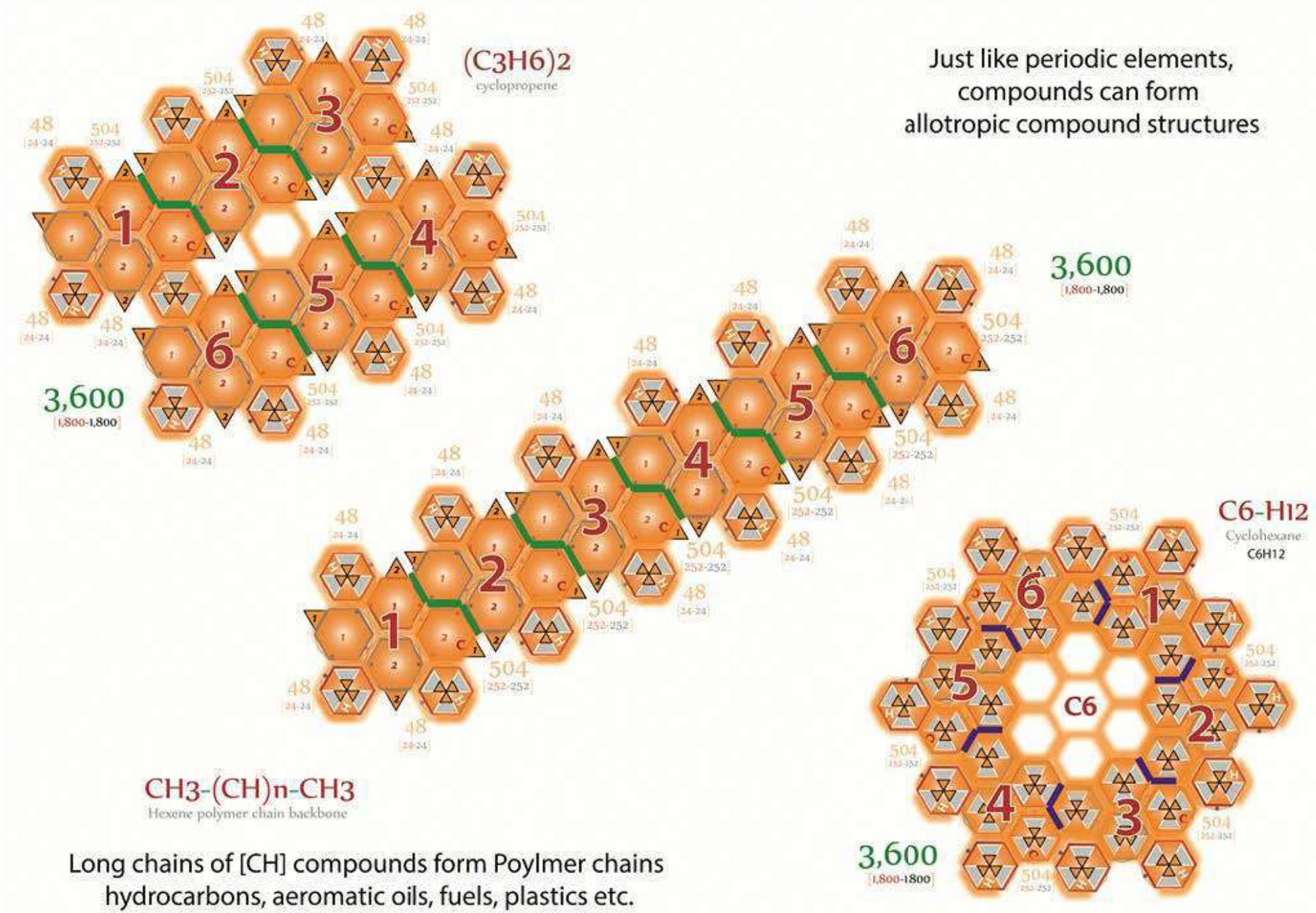

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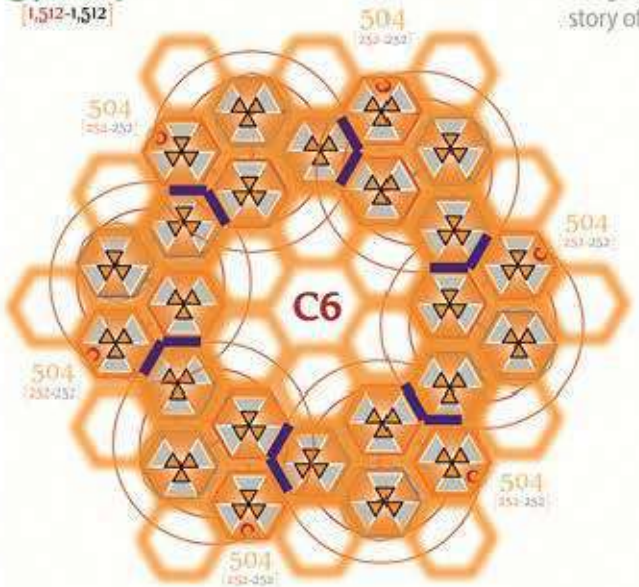
3,024
[1,512-1,512]

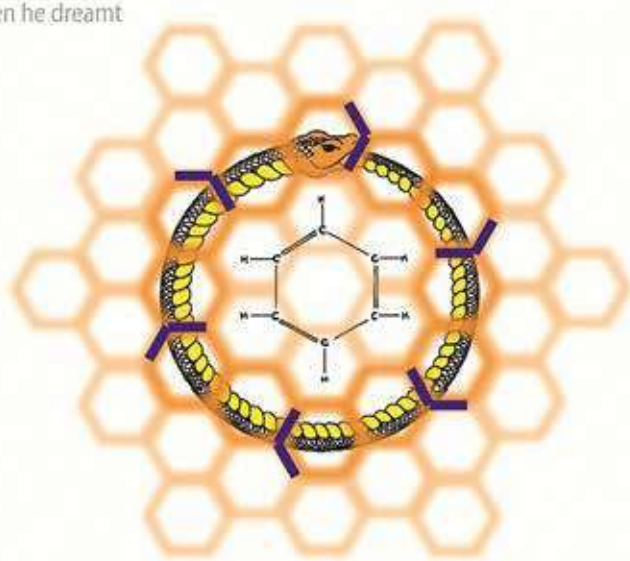


Carbon ring

Rings of atoms are also common in organic structures. You may have heard the famous story of Auguste Kekulé first realizing that benzene has a ring structure when he dreamt of snakes biting their own tails.

Friedrich August Kekul

(7 September 1829 - 13 July 1896)



Organic Chemistry

In 1865, August Kekulé presented a paper at the Académie des Sciences in Paris suggesting a cyclic structure for benzene, the inspiration for which he ascribed to a dream. However, was Kekulé the first to suggest that benzene was cyclic. Some credit an Austrian schoolteacher, Josef Loschmidt with the first depiction of cyclic benzene structures.

In 1861, 4 years before Kekulé's dream, Loschmidt published a book in which he represented benzene as a set of rings. It is not certain whether Loschmidt or Kekulé—or even a Scot named Archibald Couper—got it right first

3,108
[1,554-1,554]

Carbon-Nitrogen ring

Some non-benzene-based compounds called heteroarenes, which follow Hückel's rule, are also aromatic compounds. In these compounds, at least one carbon atom is replaced by one of the heteroatoms oxygen, nitrogen, or sulfur.

Carbon-Oxygen ring

3,192
[1,596-1,596]

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Benzene molecules

Benzene, or benzol, is an organic chemical compound and a known carcinogen with the molecular formula C6H6.

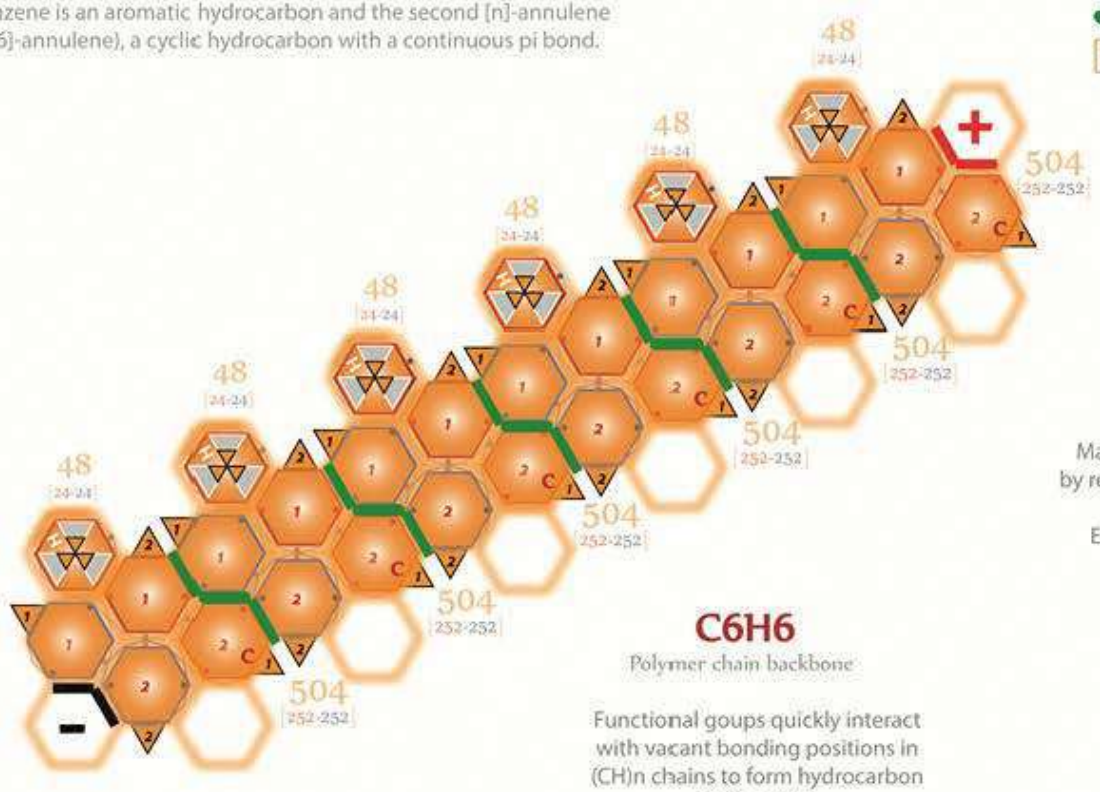
It is sometimes abbreviated Ph–H.
Benzene is a colorless and highly flammable liquid with a sweet smell and a relatively high melting point.

Because it is a known carcinogen, its use as an additive in gasoline is now limited, but it is an important industrial solvent and precursor in the production of drugs, plastics, synthetic rubber, and dyes. Benzene is a natural constituent of crude oil, and may be synthesized from other compounds present in petroleum.

Benzene is an aromatic hydrocarbon and the second [n]-annulene ([6]-annulene), a cyclic hydrocarbon with a continuous pi bond.

Cyclic hydrocarbon compounds are often referred to as Aromatic compounds due to their sweet smell

3,312
[1,656-1,656]



C6H6
Polymer chain backbone

Functional goups quickly interact with vacant bonding positions in (CH)n chains to form hydrocarbon compounds

(CH)6
Benzene ring
C6H6

A aromatic hydrocarbon is formed when CH compounds form a cyclic molecule

Many important additional chemical compounds are derived from benzene by replacing one or more of its hydrogen atoms with another functional group.

Examples of simple benzene derivatives are phenol, toluene, and aniline, abbreviated PhOH, PhMe, and PhNH2, respectively

Linear (CH)n chains are rarely found in nature as the Positive and Negative tail ends of Hydrocarbon chain interact and bond to form cyclic compounds.

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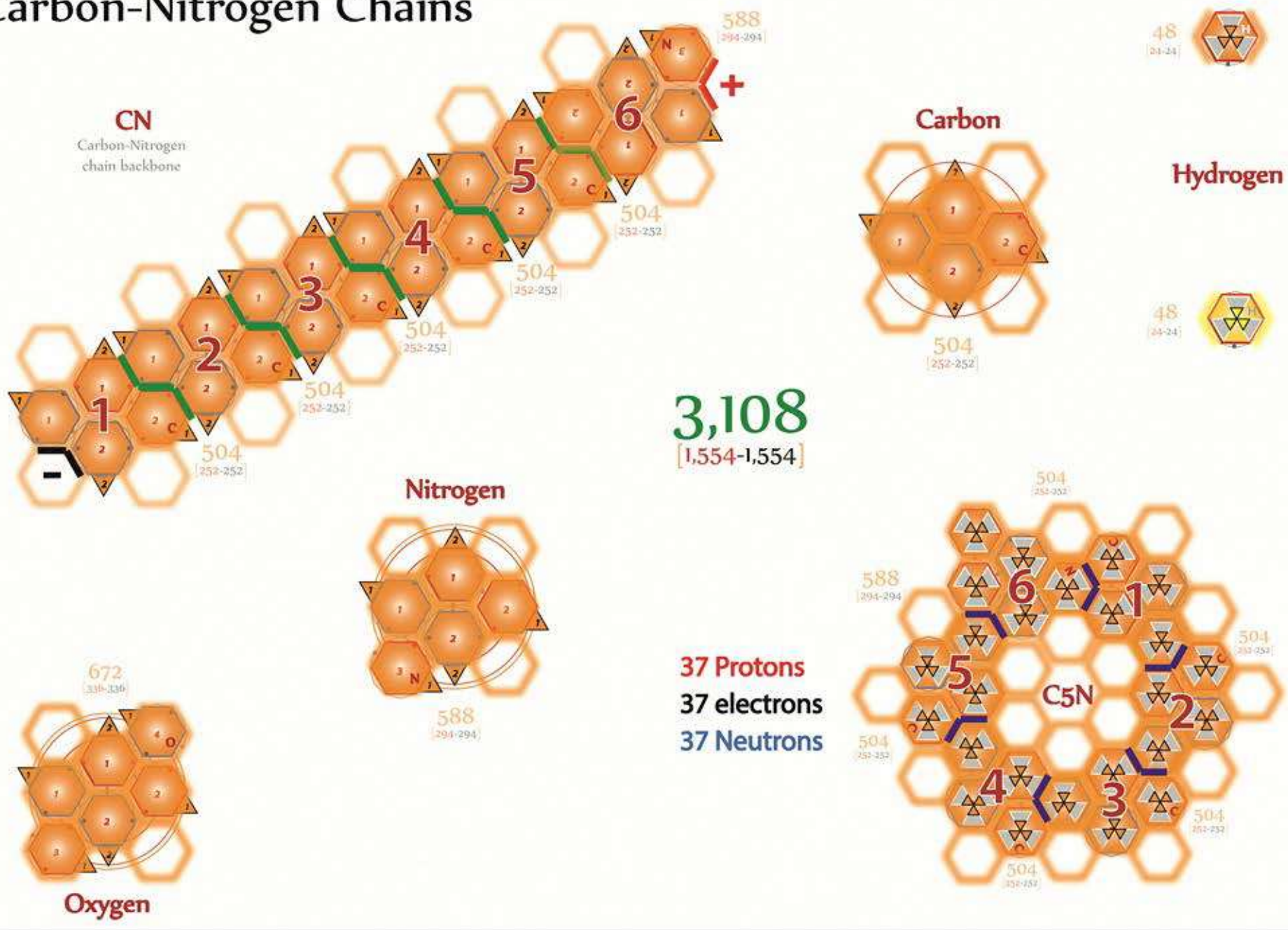
Carbon-Nitrogen Chains



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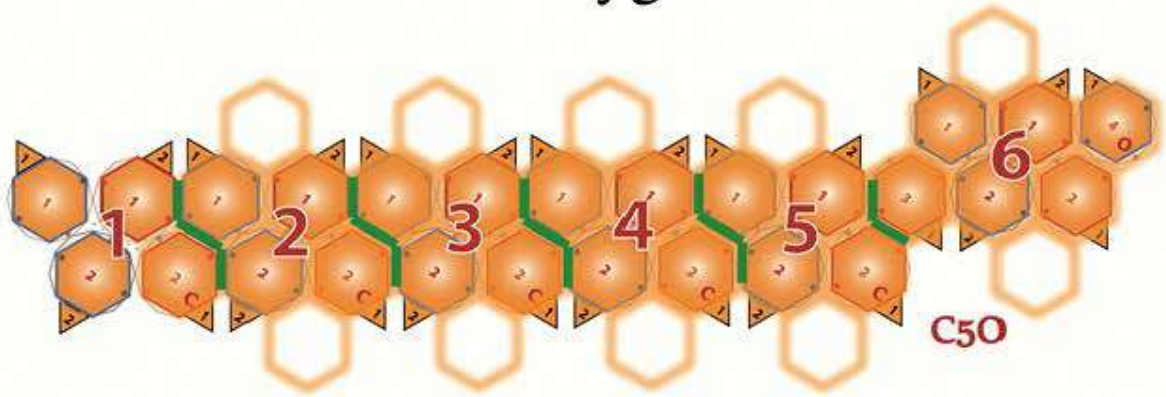
Carbon-Oxygen Chains

48
[24-24]

Hydrogen



672
[336-336]

Oxygen

Heterocyclic Rings

Tetrahydropyran is the organic compound consisting of a saturated six-membered ring containing five carbon atoms and one oxygen atom.

Carbon

504
[252-252]

3,192
[1,596-1,596]

38 Protons
38 electrons
38 Neutrons

Nitrogen

588
[294-294]

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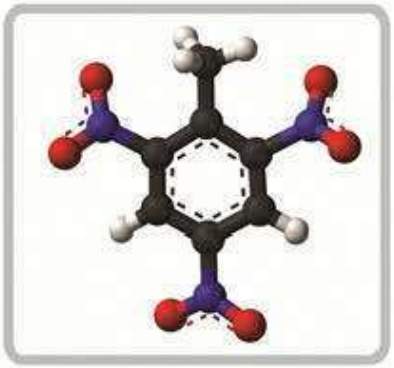
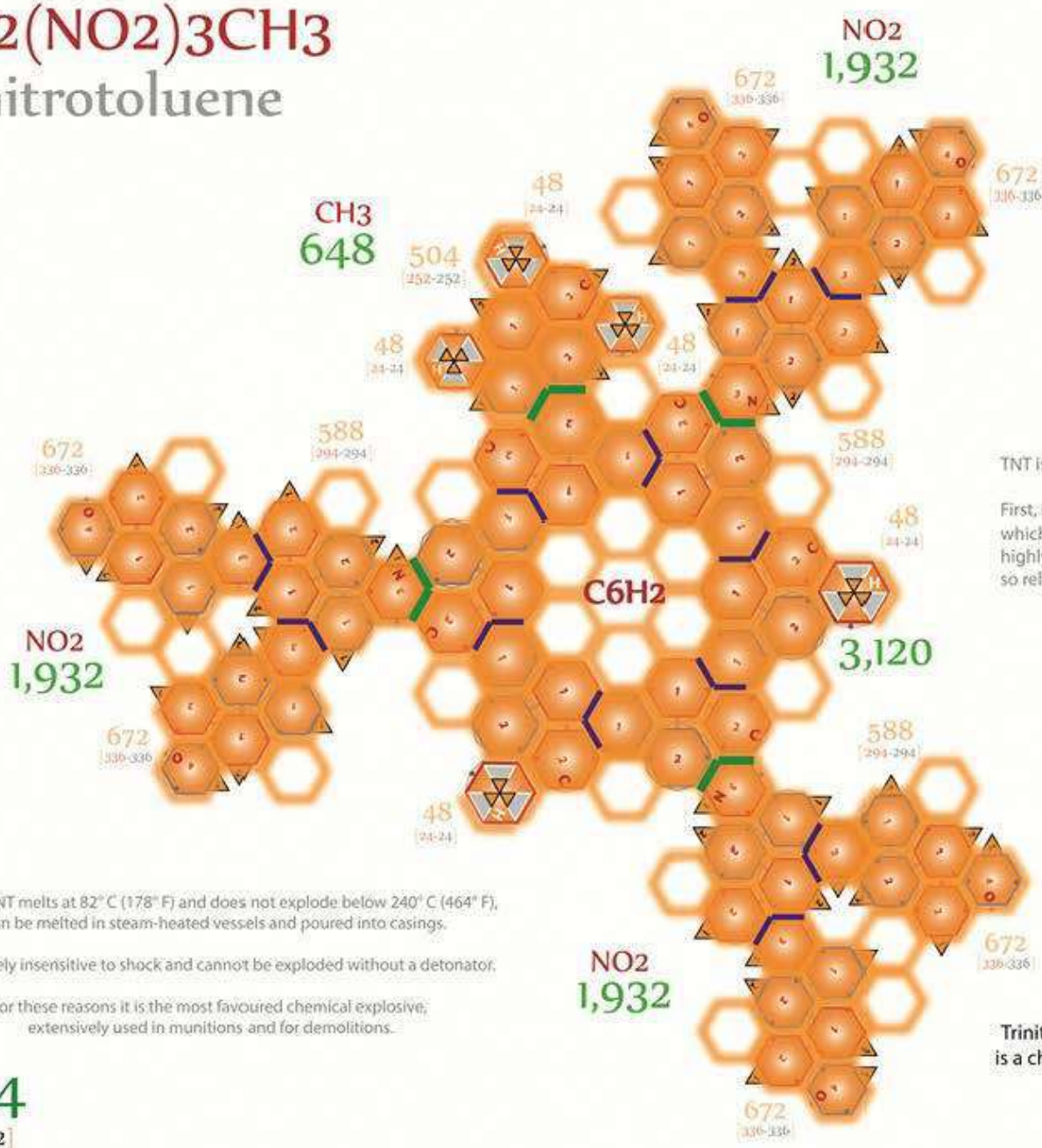
$C_6H_2(NO_2)_3CH_3$

Trinitrotoluene



2,4,6-trinitrotoluene is better known by its initials, TNT. It is an important explosive, since it can very quickly change from a solid into hot expanding gases.



TNT is explosive for two reasons;

First, it contains the elements carbon, oxygen and nitrogen, which means that when the material burns it produces highly stable substances (CO, CO2 and N2) with strong bonds, so releasing a great deal of energy.

Secondly, TNT is chemically unstable - the nitro groups are so closely packed that they experience a great deal of strain and hindrance to movement from their neighbouring groups.

Thus it doesn't take much of an initiating force to break some of the strained bonds, and the molecule then flies apart.

Because TNT melts at 82° C (178° F) and does not explode below 240° C (464° F), it can be melted in steam-heated vessels and poured into casings.

It is relatively insensitive to shock and cannot be exploded without a detonator.

For these reasons it is the most favoured chemical explosive, extensively used in munitions and for demolitions.

Trinitrotoluene, or more specifically, 2,4,6-trinitrotoluene, is a chemical compound with the formula $C_6H_2(NO_2)_3CH_3$

9,564
[4,782-4,782]

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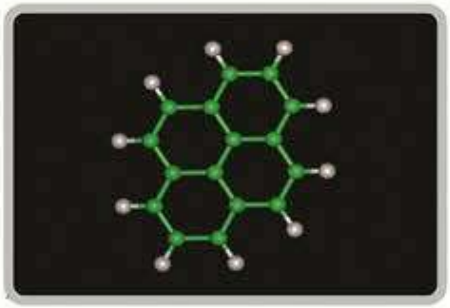
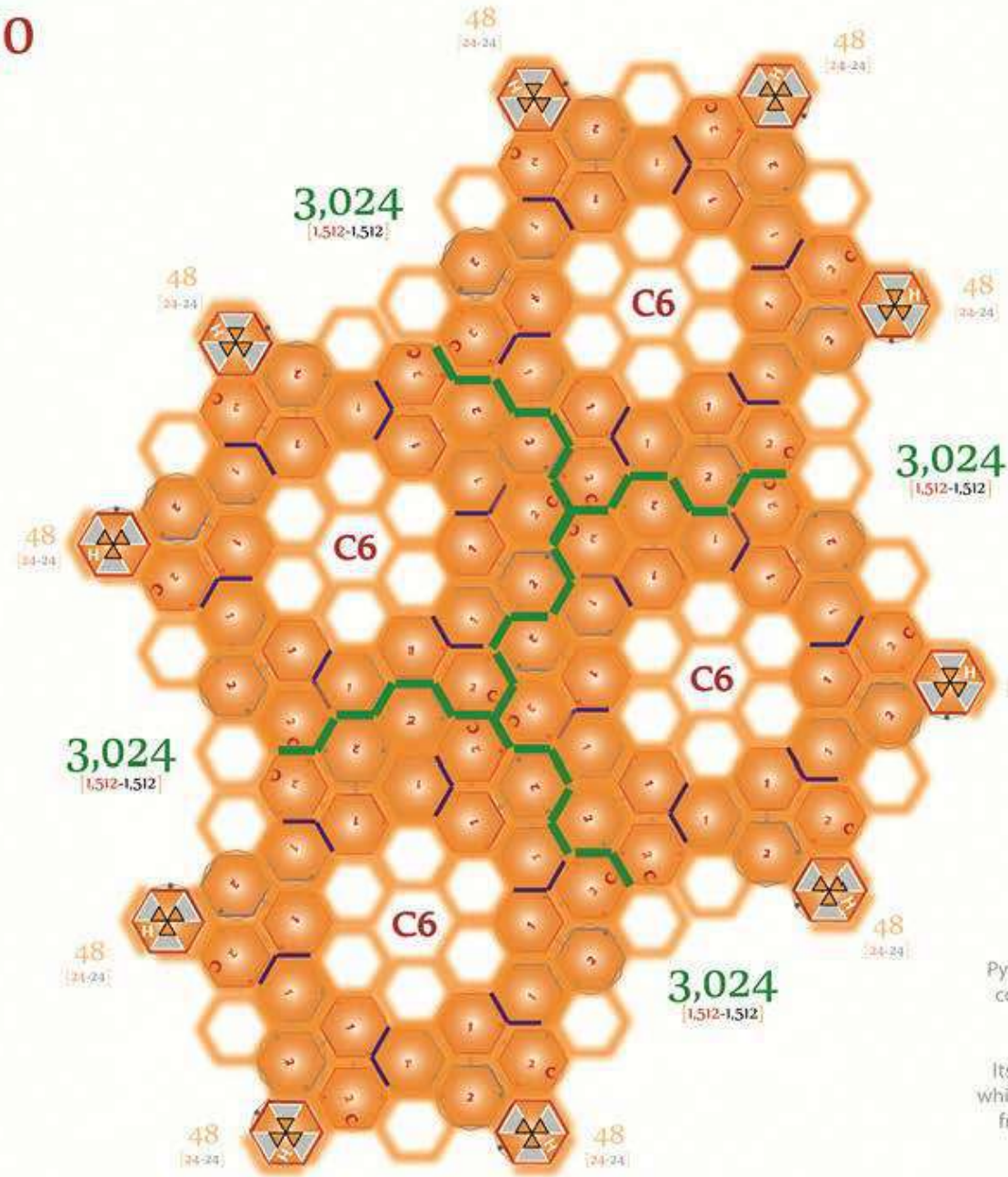
(C6)4-H10
Pyrene





Pyrene highlights the failings of Lewis diagram structures

Which can be rectified using charged Tetryonic geometric Matter topologies for all elements and compound interactions & modelling

Pyrene is a polycyclic aromatic hydrocarbon (PAH) consisting of four fused benzene rings, resulting in a flat aromatic system.

Its chemcial formula as is often stated as C16H10, which tetryonic geometry shows is an error resulting from not using equilateral quantum geometries in chemical topology modelling.

Four cyclic carbon rings cannot be formed with only 16 C-atoms

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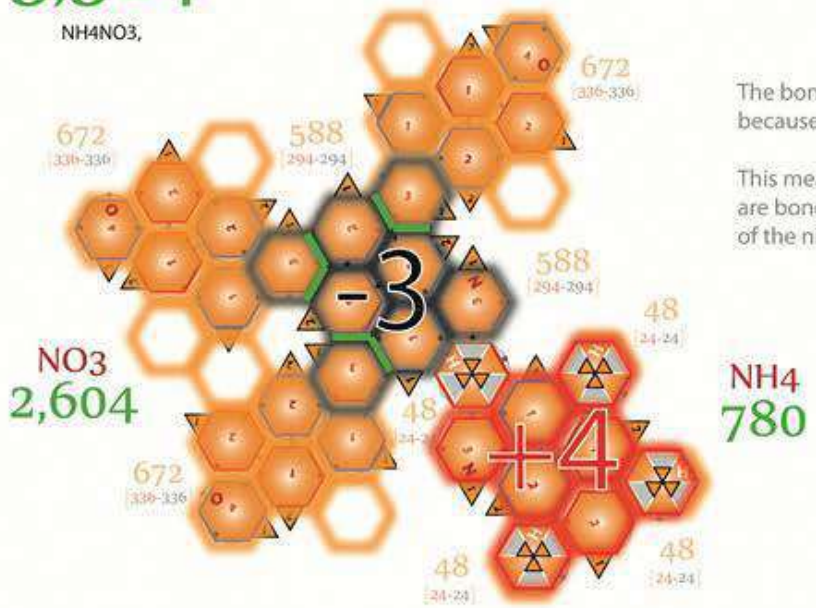
Ammonium Nitrate

3,384

NH4NO3,

Ammonium nitrate is composed of two polyatomic ions:
1) Ammonium Ion (NH4+)
2) Nitrate Ion (NO3-)

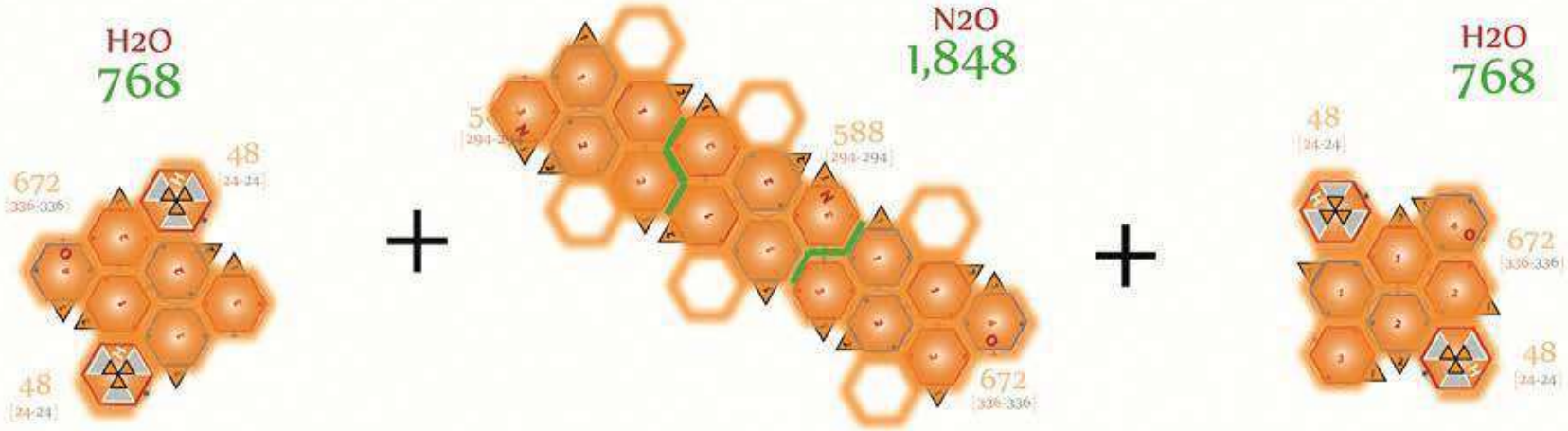
The bond between these ions is an ionic bond meaning the ammonium ion transfers an electron to the nitrate ion.



The bonds in a polyatomic atomic ion are covalent because they take place between gases.

This means that the hydrogens of the ammonium ion are bonded to the nitrogen covalently and that the oxygens of the nitrate are bonded to the nitrogen covalently

Ammonium nitrate decomposes into the gases nitrous oxide and water vapor when heated (non-explosive reaction); however, ammonium nitrate can be induced to decompose explosively by detonation.



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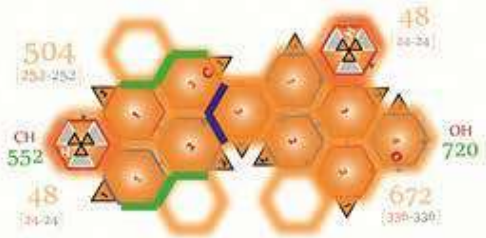
Carbohydrates

A carbohydrate is an organic compound that consists only of carbon, hydrogen, and oxygen (with a hydrogen:oxygen ratio of 2:1) in other words, with the empirical formula C*m*(H2O)*n*



Monosaccharides

Ribose

Gluclose

Lactose

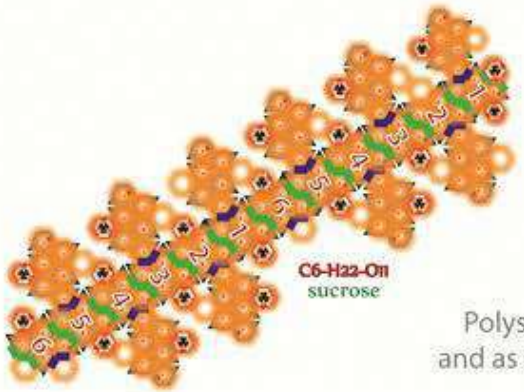
Oligosaccharides

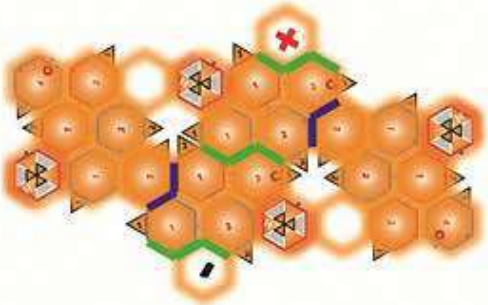
$C_m(H_2O)_n$

Fructose

Sucrose

Deoxyribose





Disaccharides

Polysaccharides

Carbohydrates perform numerous roles in living organisms. Polysaccharides serve for the storage of energy (e.g., starch and glycogen), and as structural components (e.g., cellulose in plants and chitin in arthropods)

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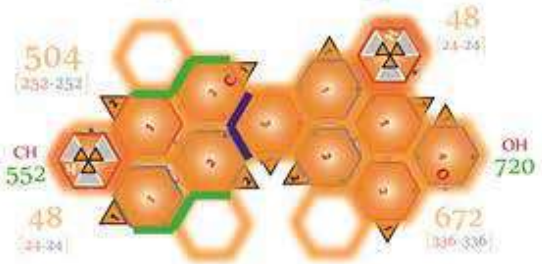
Monosaccharides

Monosaccharides are the simplest carbohydrates in that they cannot be hydrolyzed to smaller carbohydrates

The Carbon nuclei in Monosaccharides join together to form chains of biologically important carbohydrates

1,272

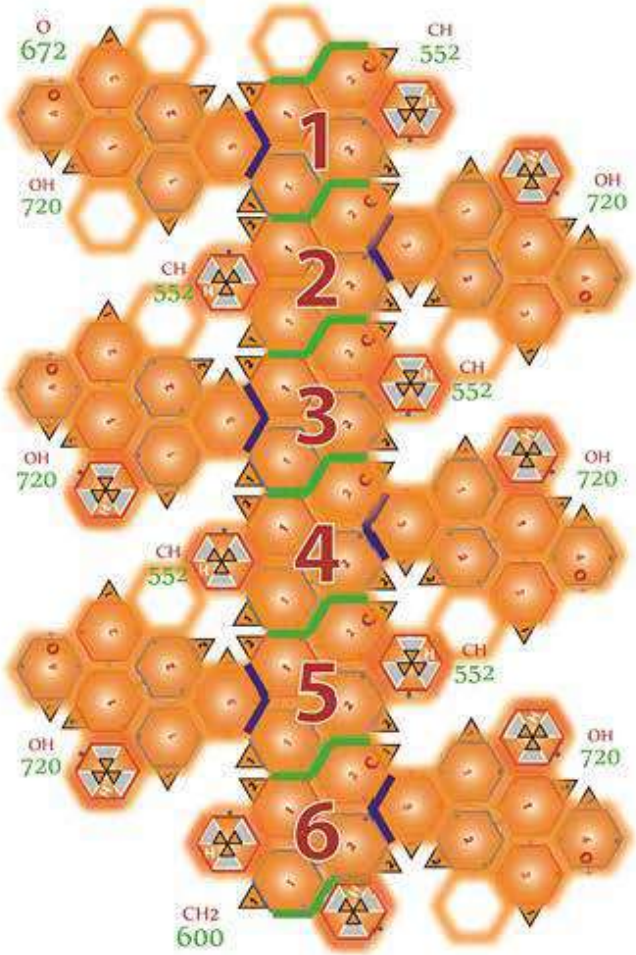
[636-636]



C(H2O)

The general chemical formula of an unmodified monosaccharide is (C•H2O) n, literally a "carbon hydrate."

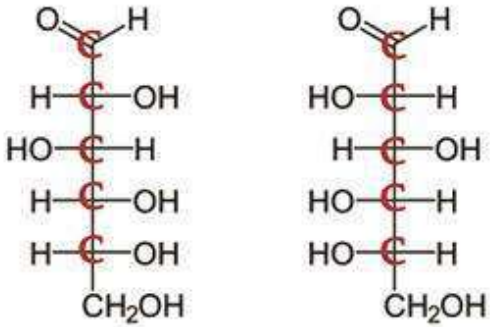
CH 552 **CH-OH** OH 720



C(H2O)6

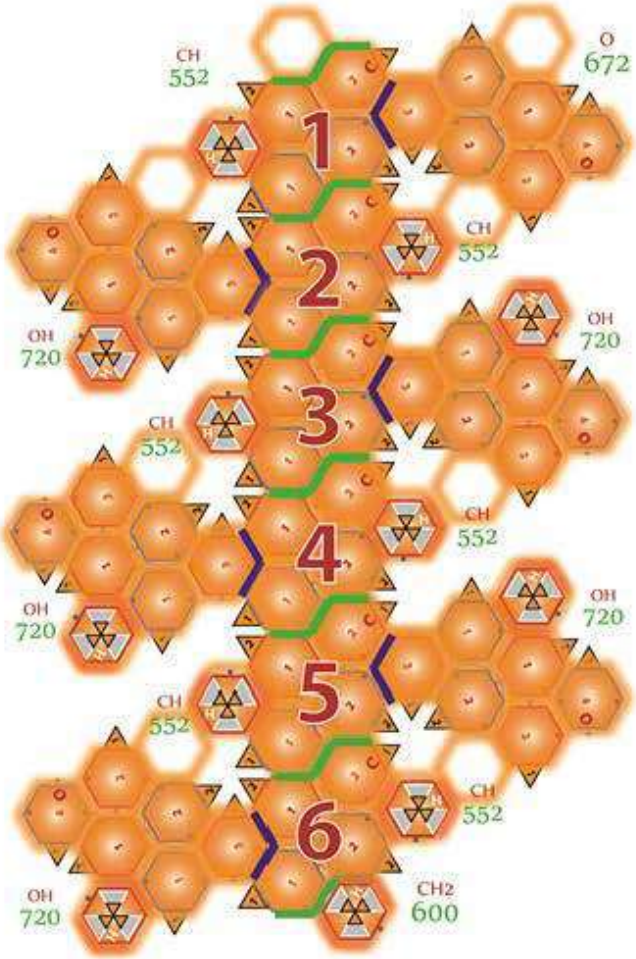
D-glucose

C6-H12-O6



D-Glucose

L-Glucose



C(H2O)6

L-glucose

C6-H12-O6

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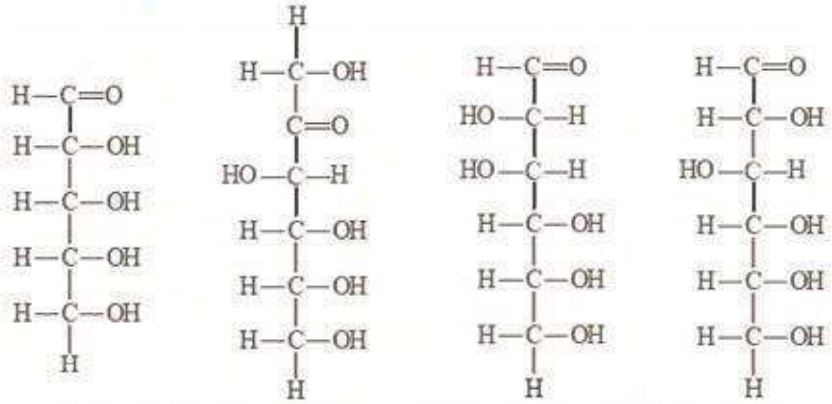
C(H2O)5
ribose
C5-H10-O5

C(H2O)n

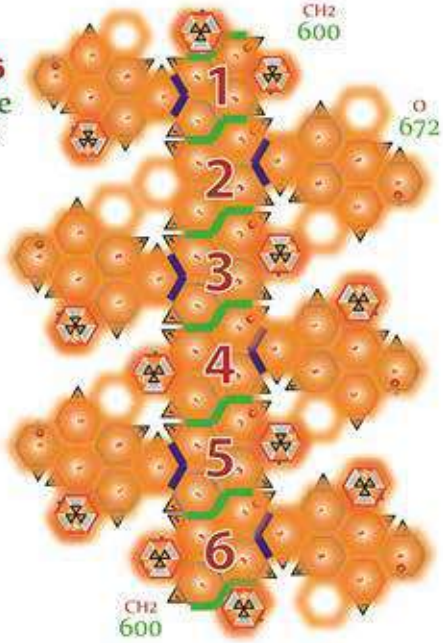
Major Monosaccharides



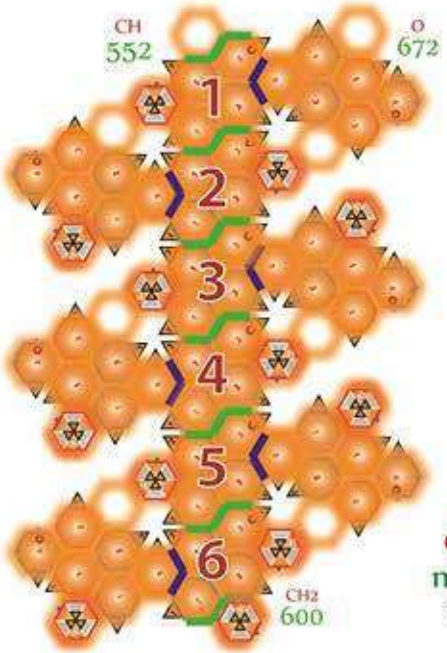
D

D & L sugars are chiral, mirror images of one another and have the same name.

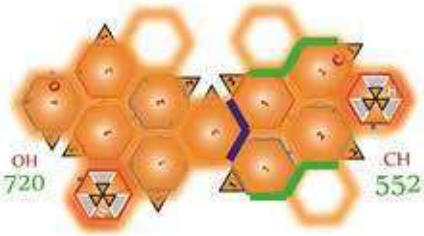
L

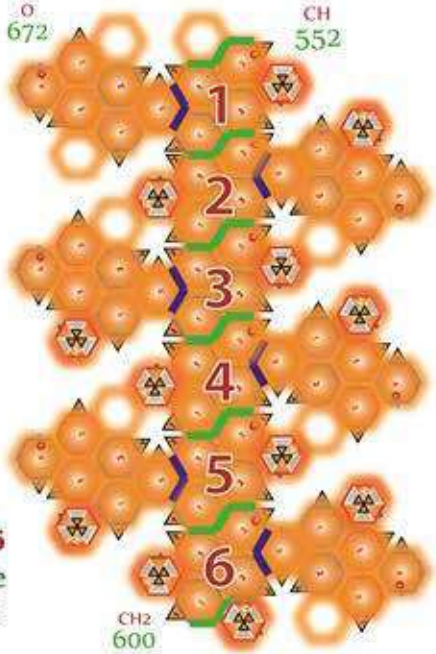


C(H2O)6
fructose
C6-H12-O6



C(H2O)6
mannose
C6-H12-O6





C(H2O)6
glucose
C6-H12-O6

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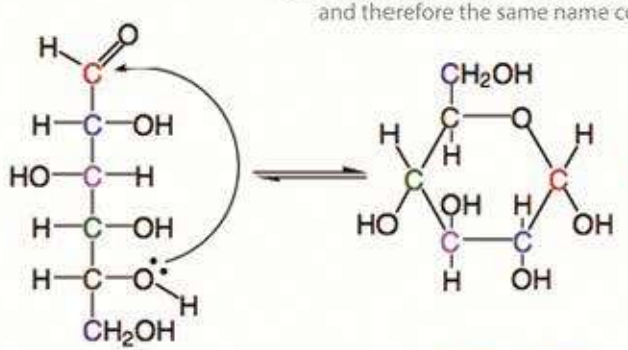
A monosaccharide often switches from the acyclic (open-chain) form to a cyclic form, through a nucleophilic addition reaction between the carbonyl group and one of the hydroxyls of the same molecule.

cyclic monosaccharides

For many monosaccharides (including glucose), the cyclic forms predominate, and therefore the same name commonly is used for forms of isomers.

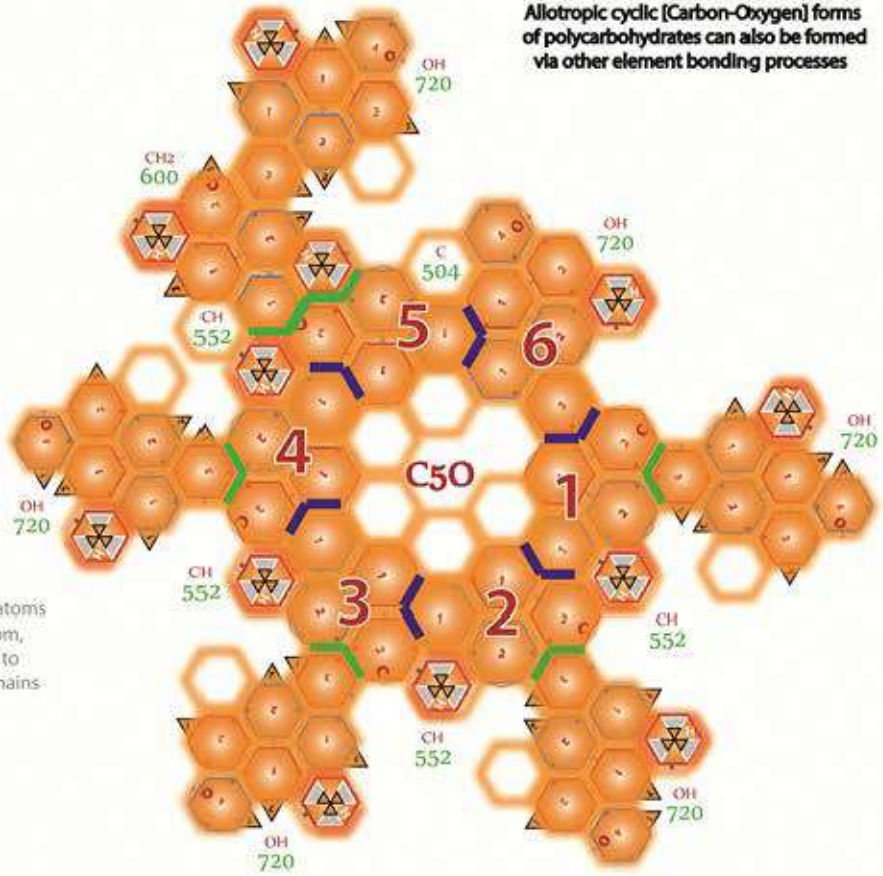
C(H2O)6
glucose
C6-H12-O6



C(H2O)6
glucopyranose
C6-H12-O6

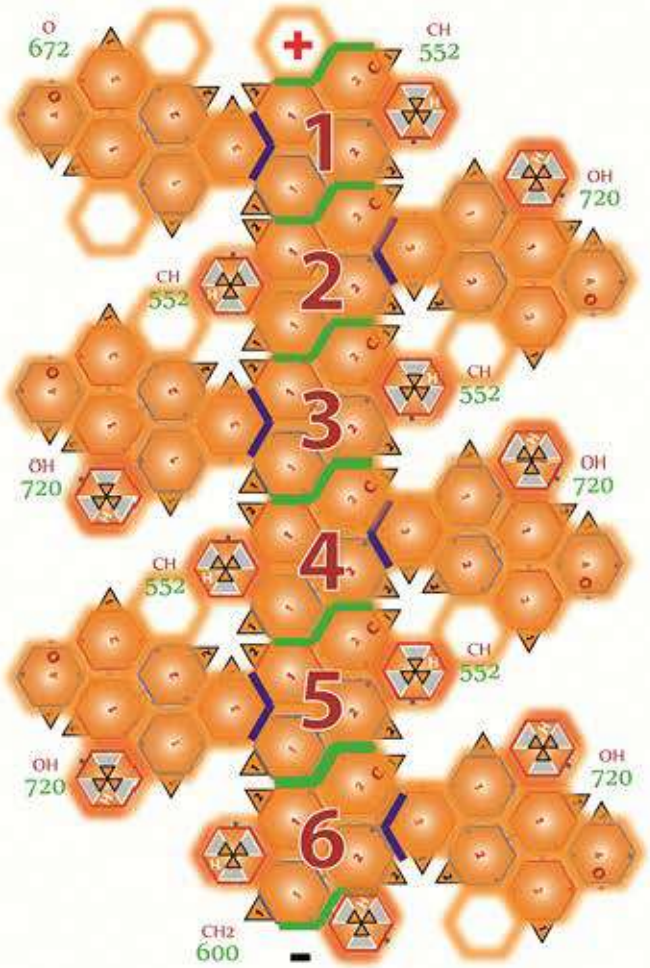
cyclic Oxygen-Carbon ring

Allotropic cyclic [Carbon-Oxygen] forms of polycarbohydrates can also be formed via other element bonding processes



C6-H12-O6
7,632
[3,816-3,816]

The reaction creates a ring of carbon atoms closed by one bridging oxygen atom, which in turn can be easily broken to restore the linear monosaccharide chains



linear saccharide chain

The Carbon nuclei in Monosaccharides chains can join together to form cyclic [Carbon-Oxygen] rings or polycarbohydrates through condensation

acyclic monosaccharides

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Condensed Disaccharides

Condensed Disaccharides are formed when two monosaccharides are joined together and a molecule of water is removed

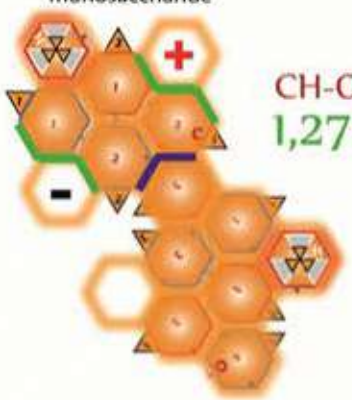
For example, milk sugar (lactose) is made from glucose and galactose whereas cane sugar (sucrose) is made from glucose and fructose

CH-OH
1,272

monosaccharide

+

monosaccharide



CH-OH
1,272

2,544
[1,272-1,272]

simple disaccharide

condensed disaccharide

C2H2O
1,776

[CH2O]12 - [H2O]

H2O
768

water molecule

Disaccharides & condensed disacchardes can bond together and form cyclic polysaccharides

The reverse of this reaction, the formation of two monosaccharides from one disaccharide, is called a hydrolysis reaction and requires one water molecule to supply the H and OH to the sugars formed.

Sucrose is used in many plants for transporting food reserves, often from the leaves to other parts of the plant. Lactose is the sugar found in the milk of mammals and maltose is the first product of starch digestion and is further broken down to glucose before absorption in the human gut.

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14,496
[7,248-7,248]

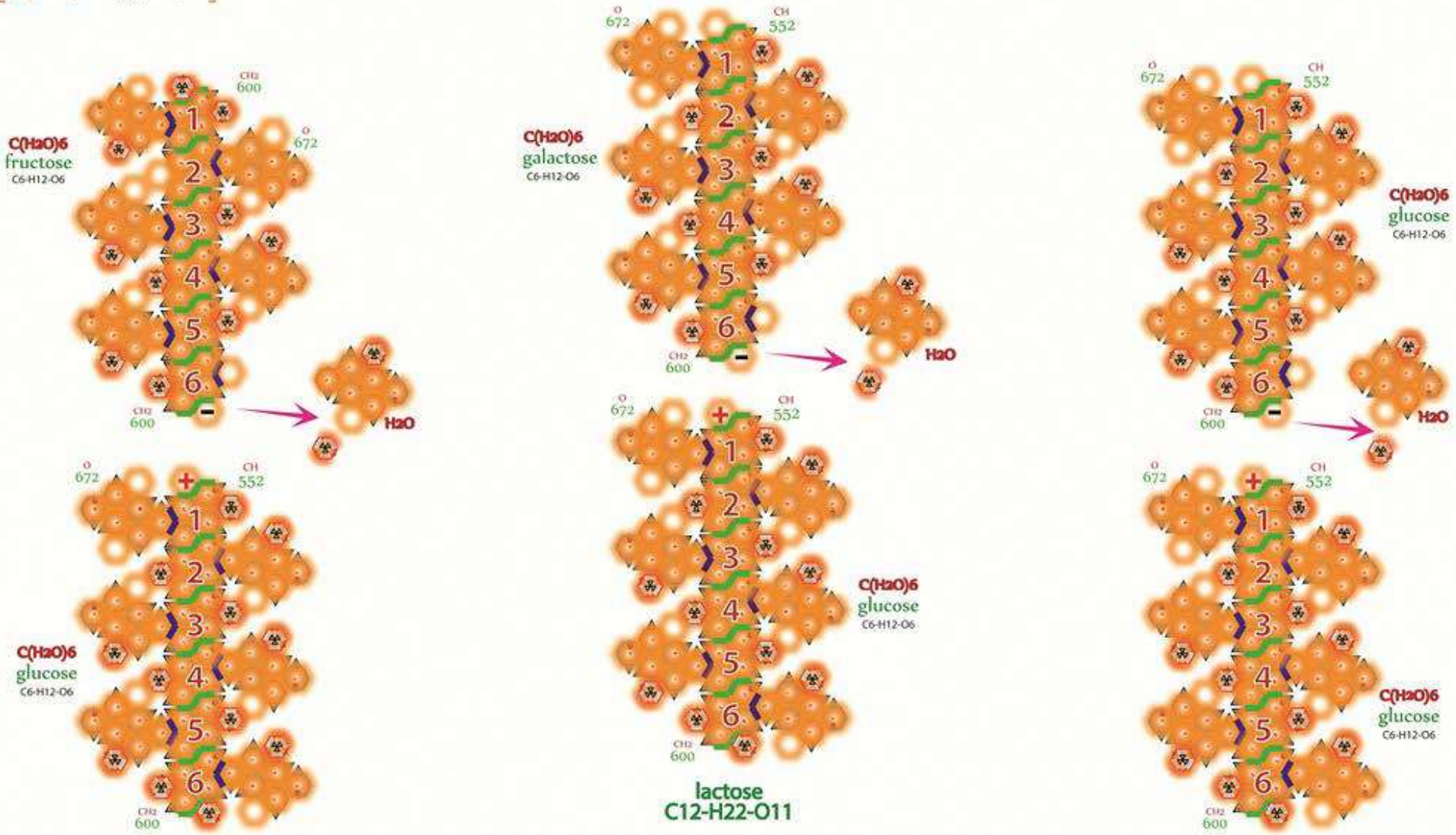
Disaccharides

Disaccharides are one of the four basic categories of carbohydrates,
(the others are monosaccharides, oligosaccharides, and polysaccharides)

Monosaccharides, such as glucose, are the monomers out of which disaccharides are constructed.

C12-(H2O)11

Disaccharides & condensed disaccharides can bond together and form cyclic polysaccharides



sucrose
C12-H22-O11

lactose
C12-H22-O11

maltose
C12-H22-O11

The general chemical formula for carbohydrates, C(H2O),
gives the relative proportions of carbon, hydrogen, and oxygen in a monosaccharide
(the proportion of these atoms are 1:2:1)-(H2O)

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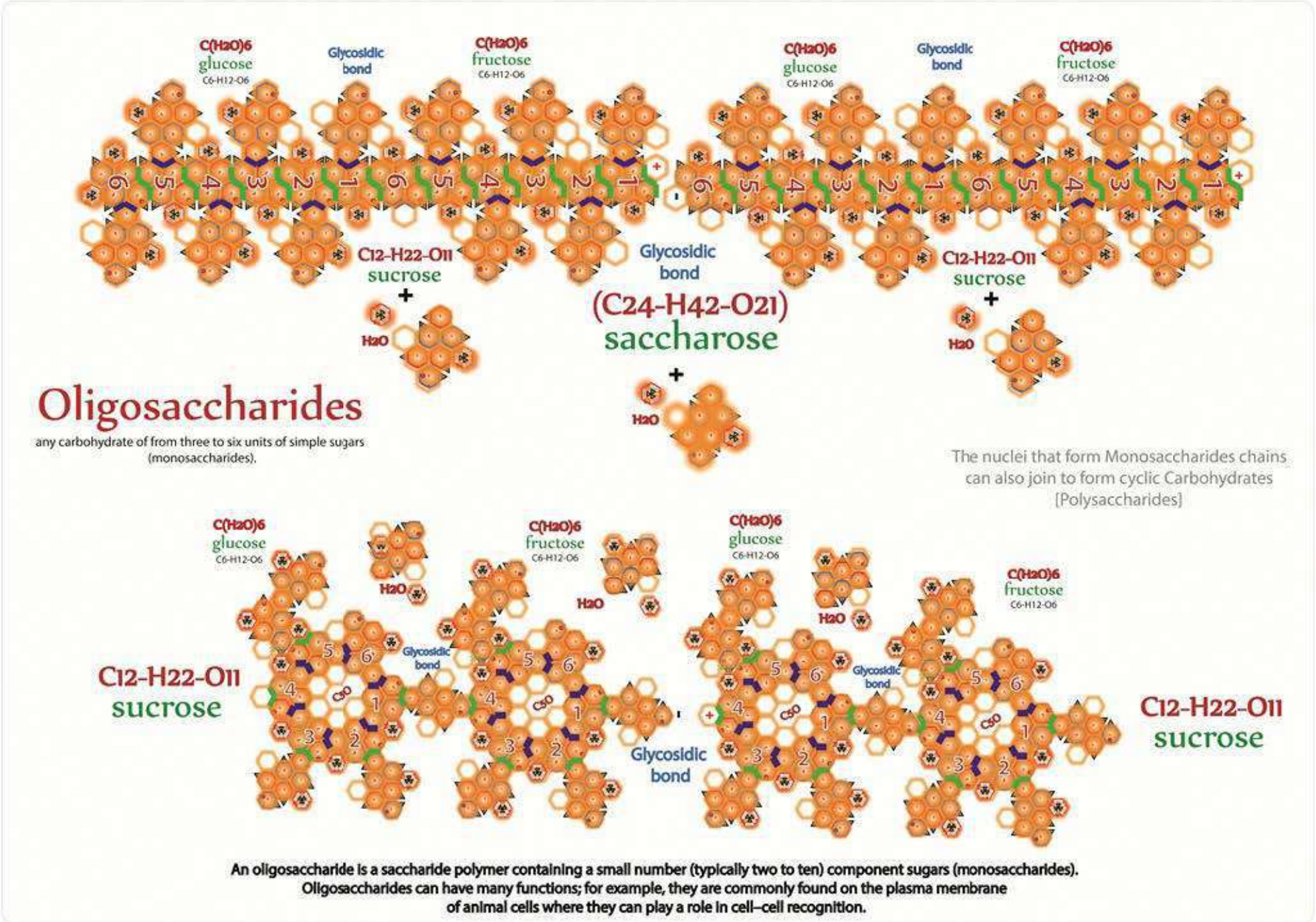

An oligosaccharide is a saccharide polymer containing a small number (typically two to ten) component sugars (monosaccharides). Oligosaccharides can have many functions; for example, they are commonly found on the plasma membrane of animal cells where they can play a role in cell–cell recognition.

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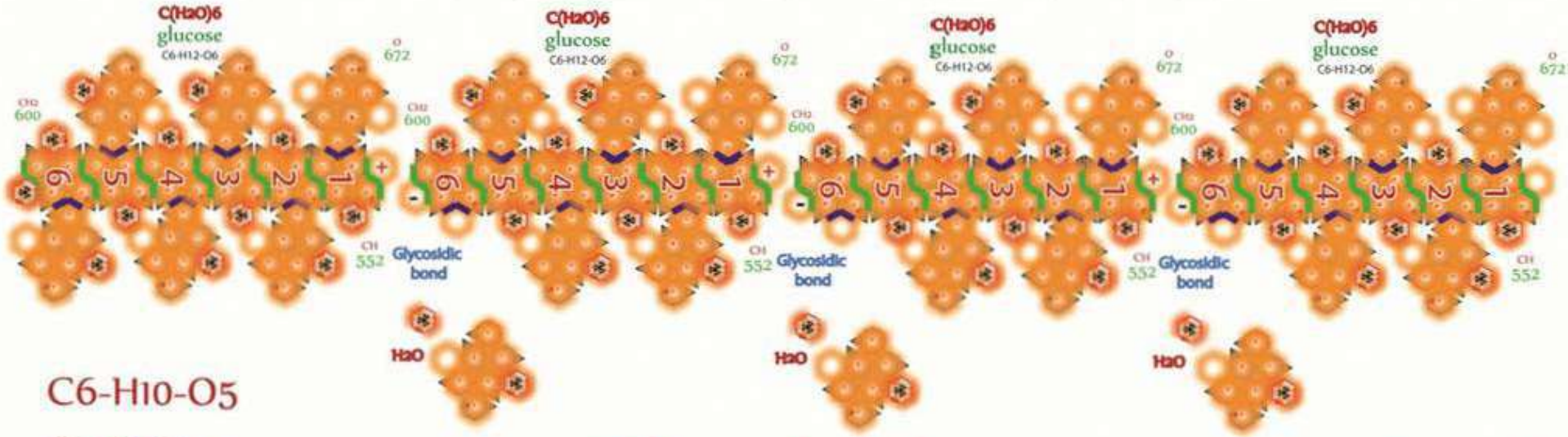
Starch or amylum is a carbohydrate consisting of a large number of glucose units joined by glycosidic bonds. This polysaccharide is produced by most green plants as an energy store.



C6-H10-O5

6,864 n

[3,432-3,432]

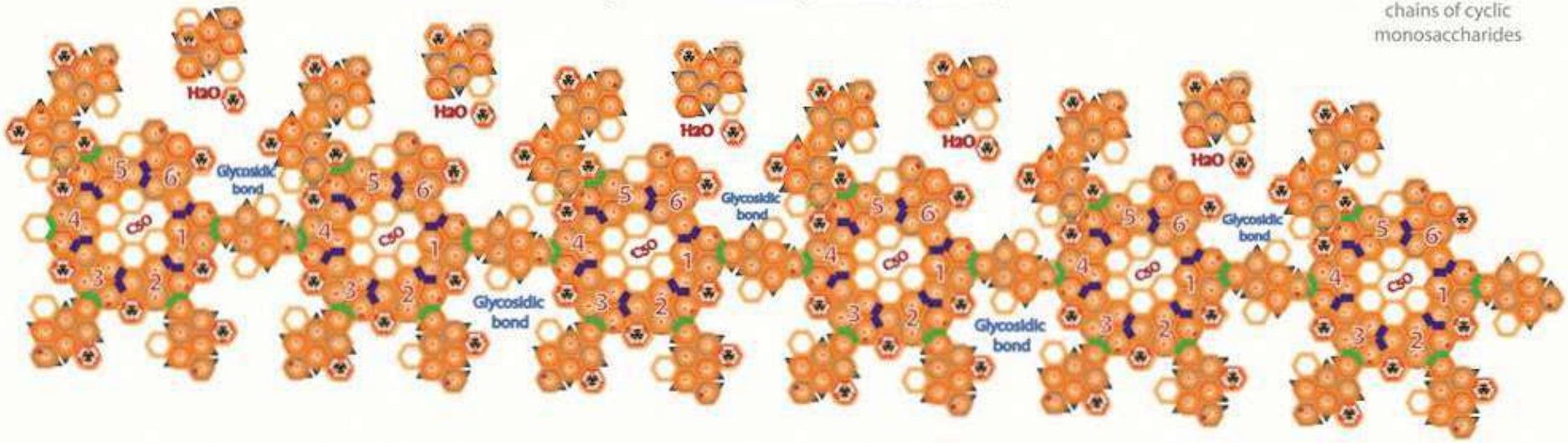
Polysaccharides

$C_x[H_2O]_y$

Polysaccharides have a general formula of Cx(H2O)y where x is usually a large number between 200 and 2500.

The repeating units in a Polysaccharide polymer backbone are often six-carbon monosaccharides, their general formula can be represented as (C6-H10-O5)n

Polysaccharides are generally comprised of chains of cyclic monosaccharides



Cellulose is an organic compound with the formula (C6H10O5)n, a polysaccharide consisting of a linear chain of several hundred to over ten thousand linked D-glucose sugars.

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Amines

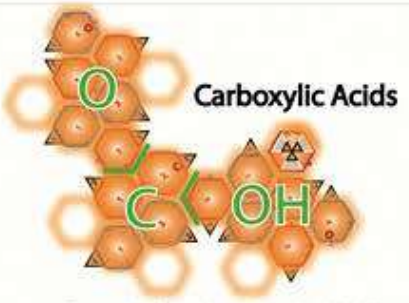
Amines are organic compounds that contain Nitrogen

NH2-[HC-R]-COOH + NH2-[HC-R]-COOH

As both the amine and carboxylic acid groups of amino acids can react to form amide bonds, one amino acid molecule can react with another and become joined through an amide linkage. This polymerization of amino acids is what creates proteins.

OH + NH2 -----> NH + H2O

This yields a peptide bond and a molecule of water via a condensation reaction



Carboxylic Acids

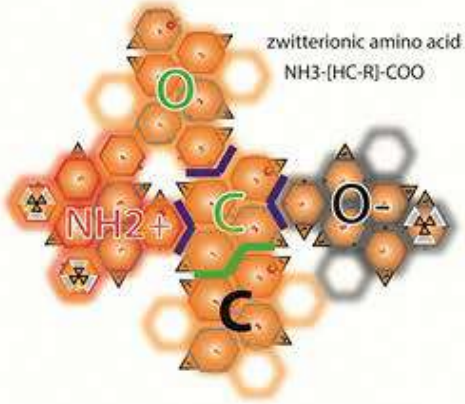
The general formula of a carboxylic acid is R-COOH

Amino Acids

Amino acids are biologically important organic compounds made from amine and carboxylic acid functional groups, along with a side-chain specific to each amino acid

un-ionized amino acid

NH2-[HC-R]-COOH

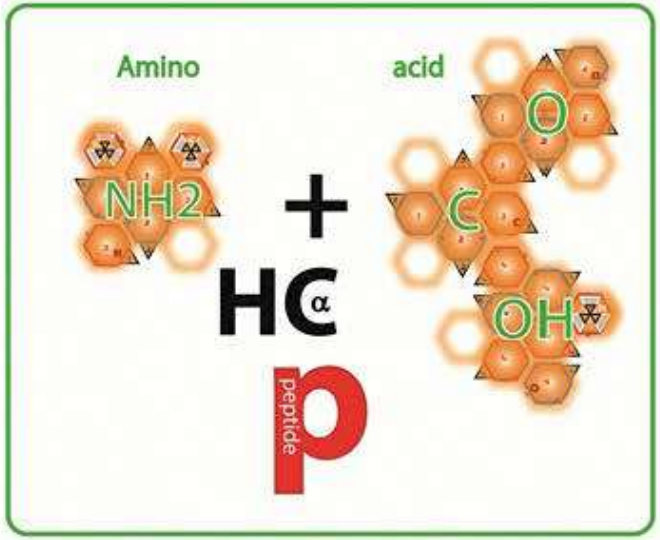


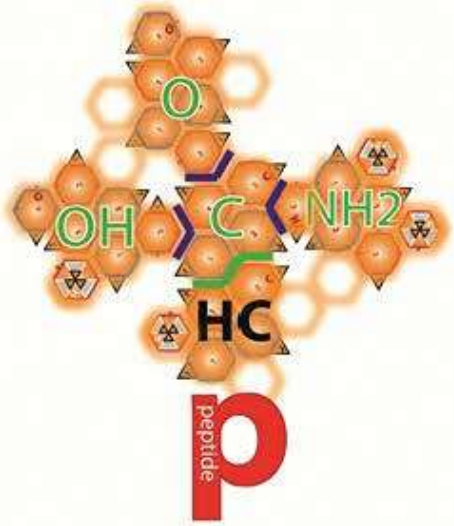
zwitterionic amino acid

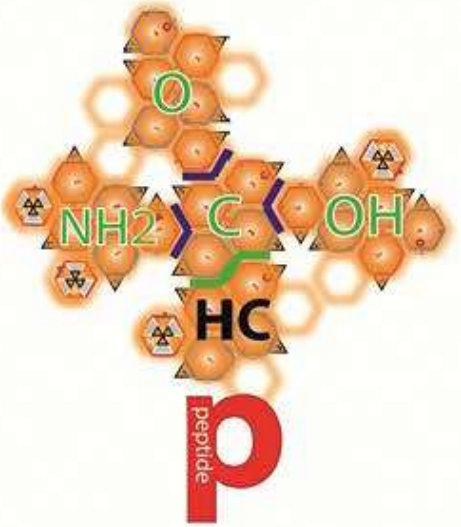
NH3-[HC-R]-COO

The α-carbon.

The α-amino acids in peptides and proteins consist of a carboxylic acid (-COOH) and an amino (-NH2) functional group attached to the same tetrahedral carbon atom







The peptide group attached to the alpha carbon distinguishes one amino acid from another (Tetryonic theory defines these compound side-chains of atoms as peptides [p])

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Peptide side chains

Amino acids are the structural units (monomers) that join together
to form short polymer chains called peptides;
or longer chains called either polypeptides or proteins

AAA
AAG
AAC
AAU
AGA
AGG
AGC
AGU
ACA
ACG
ACC
ACU
AUA
AUG
AUC
AUU

A
C5-H5-N5
Adenine

C
C4-H5-N3-O
Cytosine

CAA
CAG
CAC
CAU
CGA
CGG
CGC
CGU
CCA
CCG
CCC
CCU
CUA
CUG
CUC
CUU

3,180 **Gly** C2H5NO2
3,780 **Ala** C3H7NO2
4,452 **Ser** C3H7NO3
4,884 **Pro** C5H9NO2
4,980 **Val** C5H11NO2
5,052 **Thr** C4H9NO3
5,124 **Cys** C3H7NO2S
5,580 **Lle** C6H13NO2
5,580 **Leu** C6H13NO2
5,592 **Asn** C4H8N2O3
5,628 **Asp** C4H7NO4

p
peptide side chain

current chemical theory hypothesizes that all peptides and proteins are the result of codon triplet side chains on amino acids

Tetryonic theory reveals serious flaws in this line of thought

6,192 **Gln** C5H10N2O3
6,216 **Lys** C6H14N2O2
6,228 **Glu** C5H9NO4
6,324 **Met** C5H11NO2S
6,564 **His** C6H9N3O2
6,996 **Phe** C9H11NO2
7,392 **Arg** C6H14N4O2
7,668 **Tyr** C9H11NO3
8,640 **Trp** C11H12N2O2

GAA
GAG
GAC
GAU
GGA
GGG
GGC
GGU
GCA
GCG
GCC
GCU
GUA
GUG
GUC
GUU

G
C5-H5-N5-O
Guanine

U
C4-H4-N2-O2
Uracil

UAA
UAG
UAC
UAU
UGA
UGG
UGC
UGU
UCA
UCG
UCC
UCU
UUA
UUG
UUC
UUU

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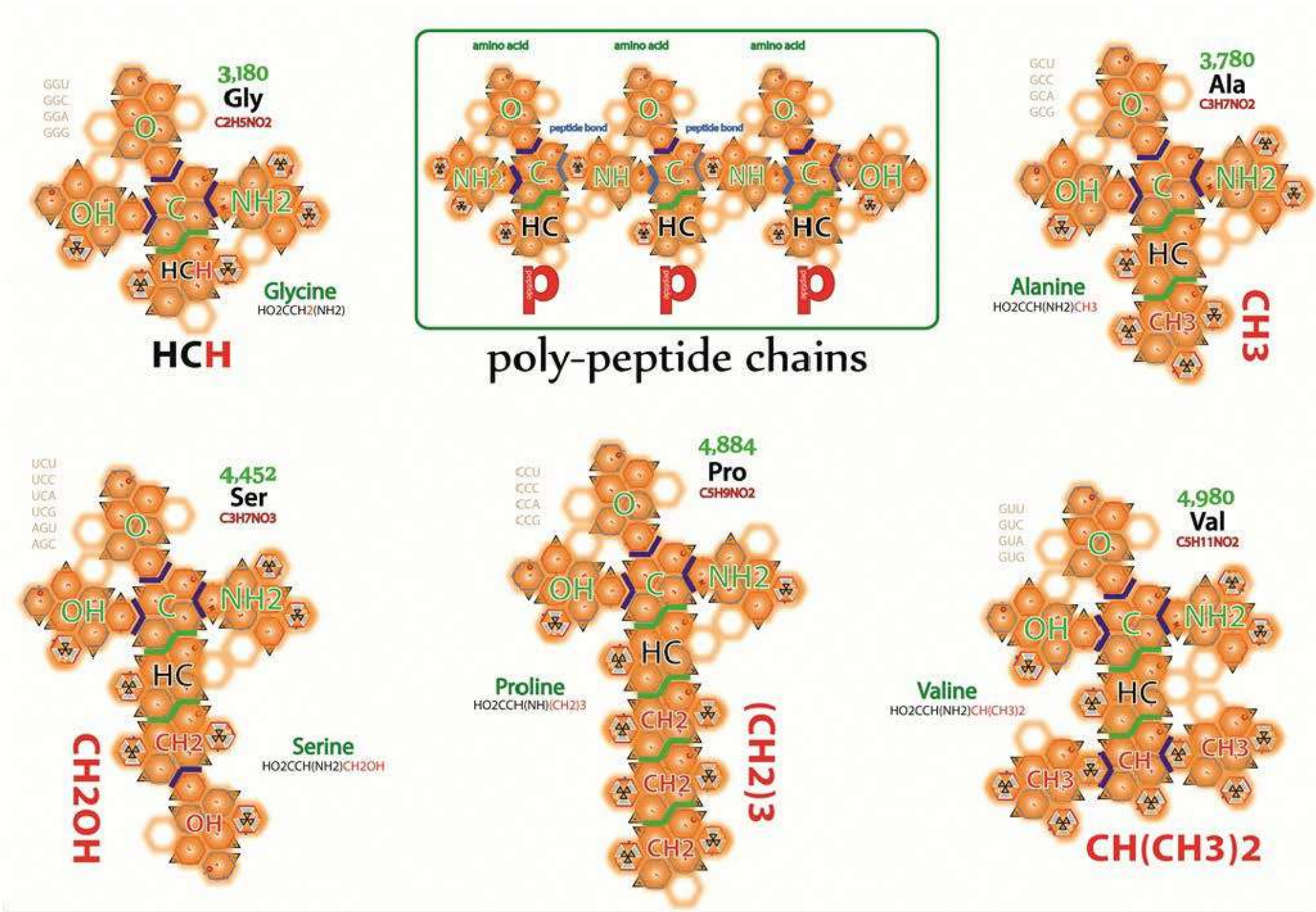

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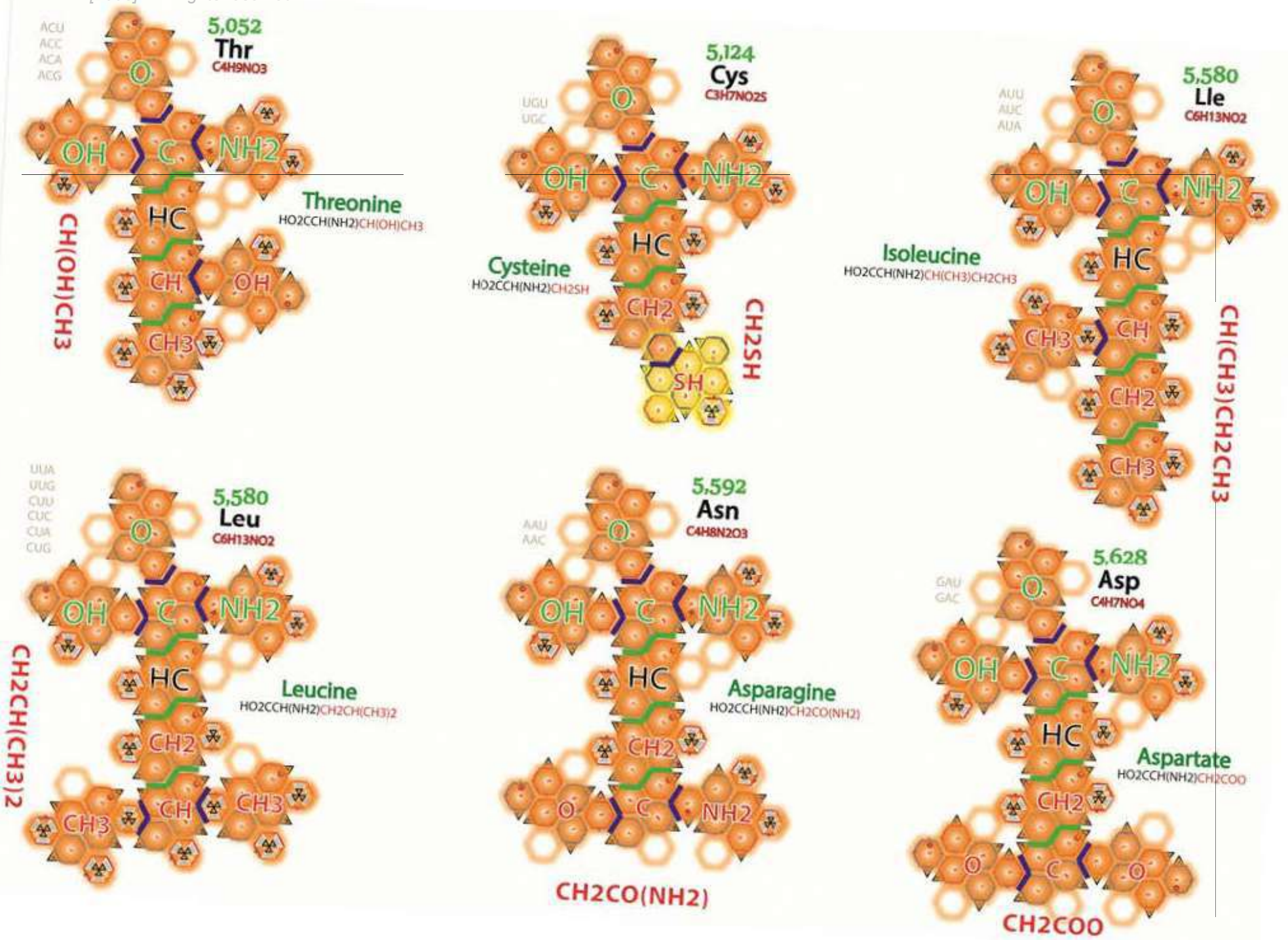

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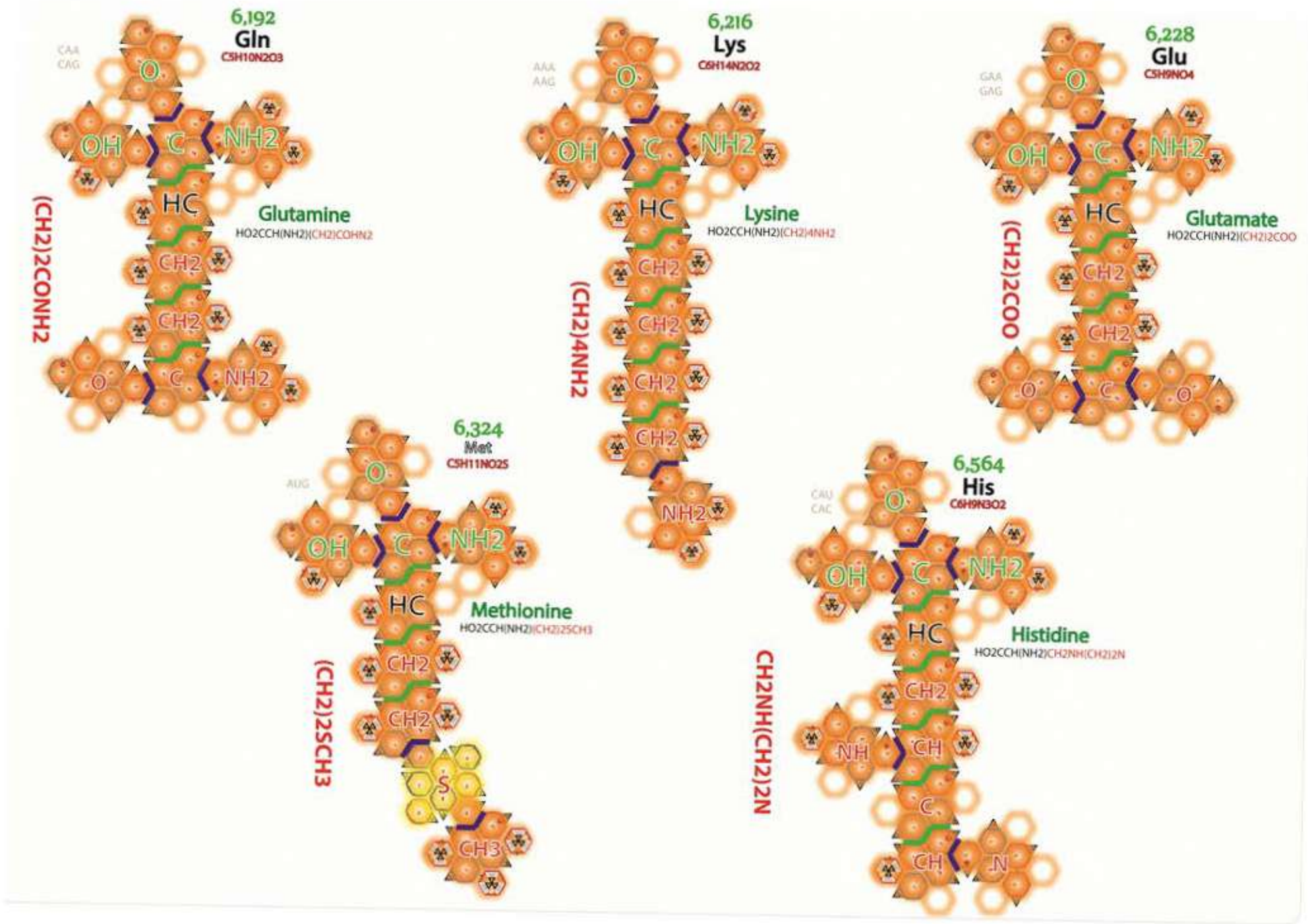

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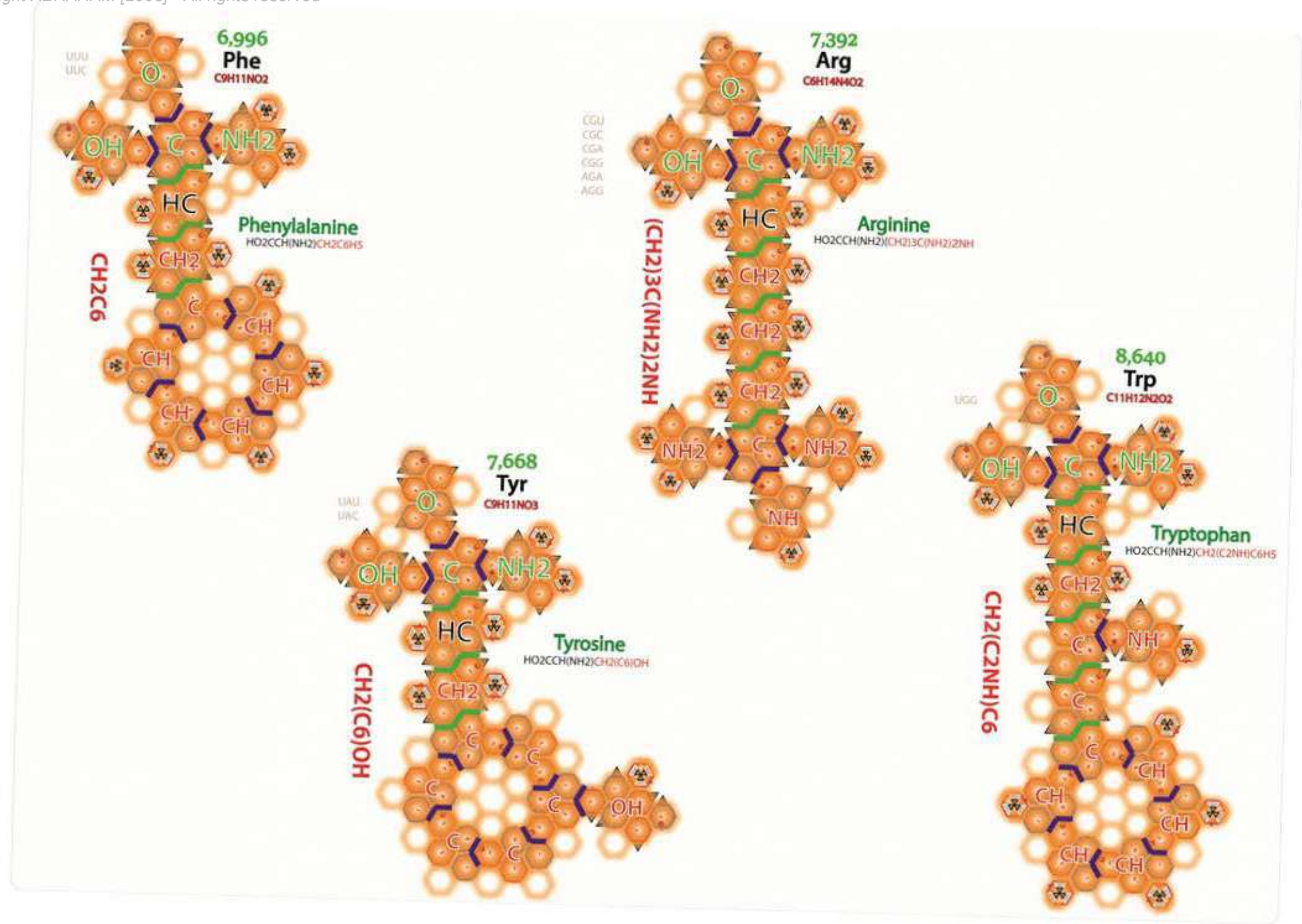

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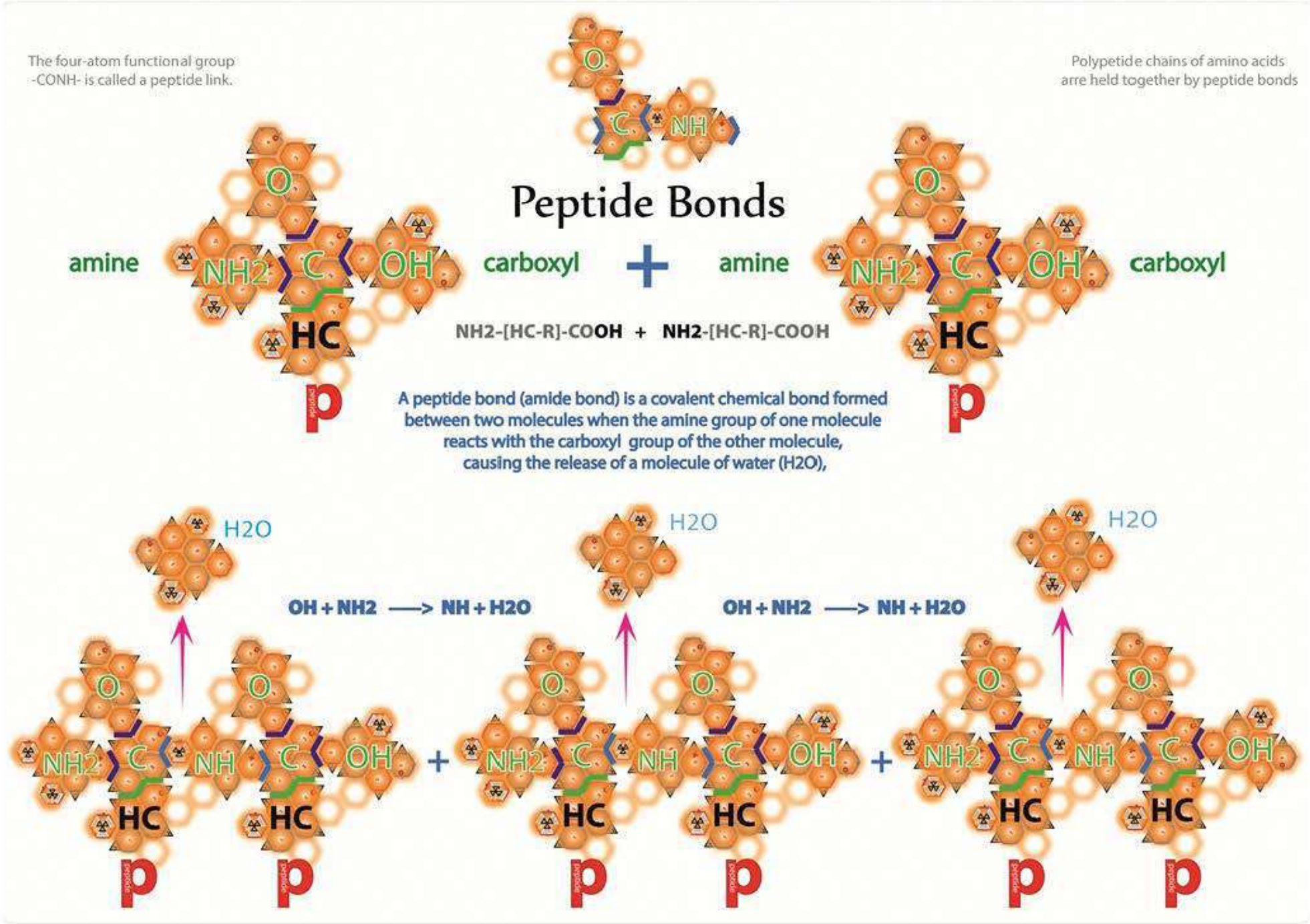
The four-atom functional group
-CONH- is called a peptide link.
Polypetide chains of amino acids
arre held together by peptide bonds
Peptide Bonds
amine
carboxyl
amine
carboxyl
NH2-[HC-R]-COOH + NH2-[HC-R]-COOH
A peptide bond (amide bond) is a covalent chemical bond formed
between two molecules when the amine group of one molecule
reacts with the carboxyl group of the other molecule,
causing the release of a molecule of water (H2O),
H2O
H2O
H2O
OH + NH2 —> NH + H2O
OH + NH2 —> NH + H2O

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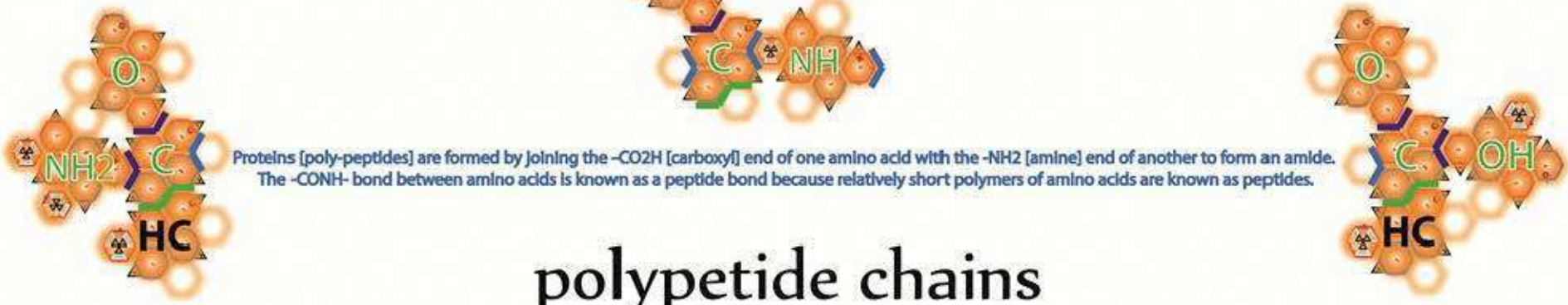
amino terminus
The beginning of a polypeptide protein molecule has a free amino group.

The four-atom functional group -CONH- is called a peptide link.

carboxy terminus
The end of a polypeptide protein molecule has a free carboxyl group.

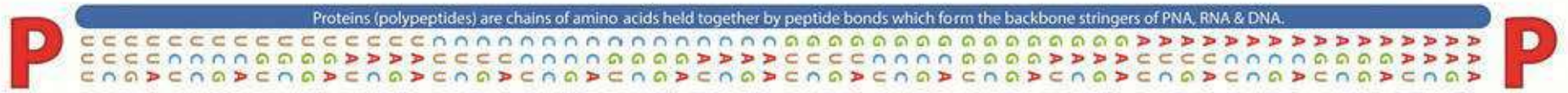


Proteins [poly-peptides] are formed by joining the –CO2H [carboxyl] end of one amino acid with the -NH2 [amine] end of another to form an amide. The -CONH- bond between amino acids is known as a peptide bond because relatively short polymers of amino acids are known as peptides.

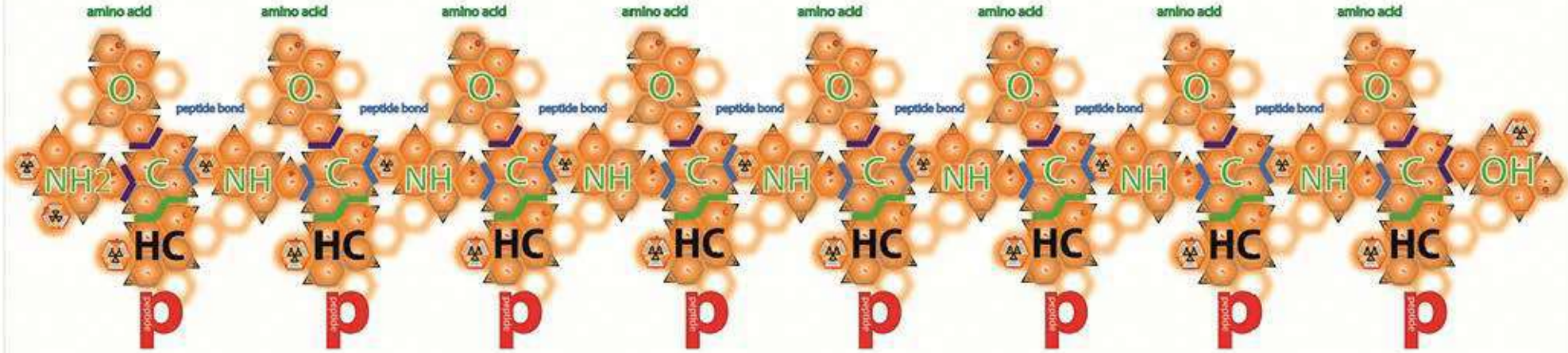
polypetide chains

Proteins are formed when amino acids are covalently linked together.

DNA and RNA have a deoxyribose and ribose sugar backbone, respectively, whereas PNA's backbone is composed of repeating (2-aminoethyl)-glycine units linked by peptide bonds.


Proteins (polypeptides) are chains of amino acids held together by peptide bonds which form the backbone stringers of PNA, RNA & DNA.
P
P

Proteins



There are 20 different nucleotide side chains present in biological molecules.

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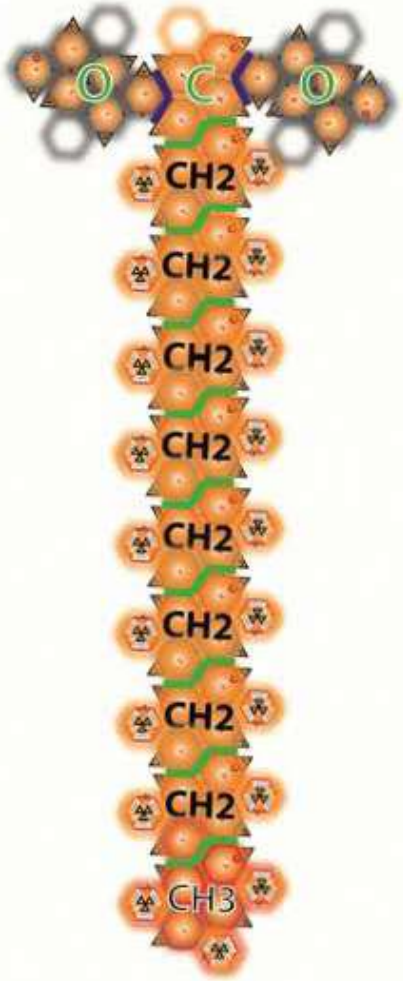
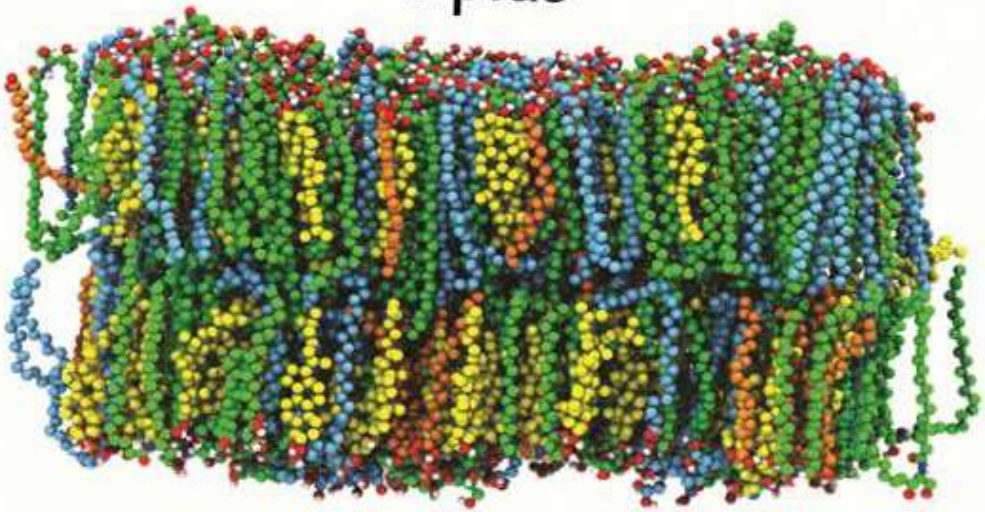
Lipids

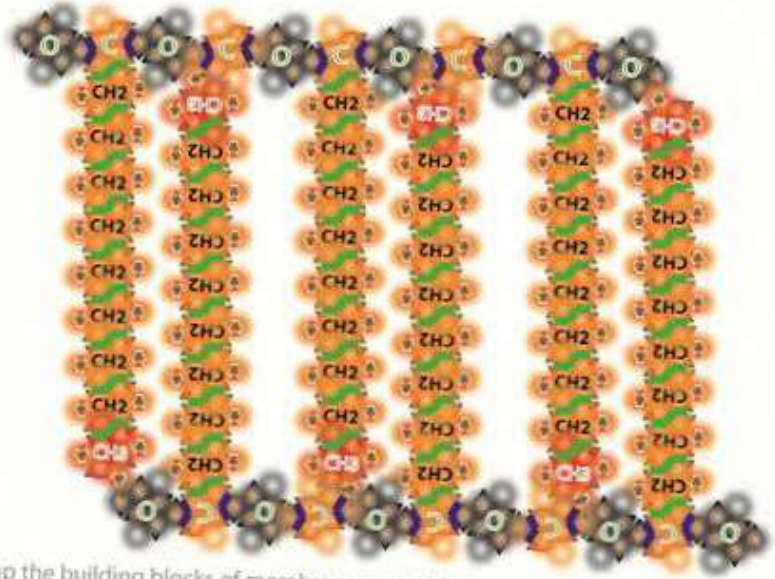
hydrophyllic



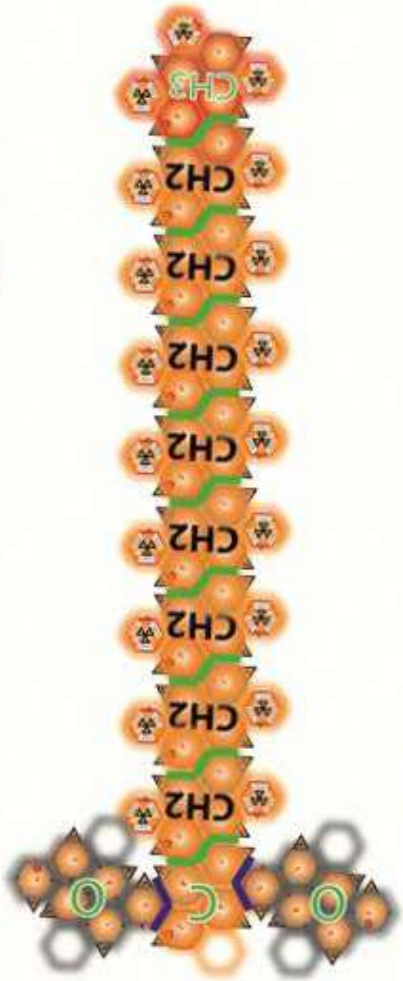
hydrophobic



Lipids are a group of naturally occurring molecules that include fats, waxes, sterols, fat-soluble vitamins (such as vitamins A, D, E, and K), mono-glycerides, di-glycerides, tri-glycerides, phospho-lipids, and others.



hydrophobic



hydrophyllic

Lipids are molecules that contain hydrocarbons and make up the building blocks of membranes, providing a semi-permeable barrier between a living cell's internal & external enviroments.

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Lewis chemical structure

Acetylcholine

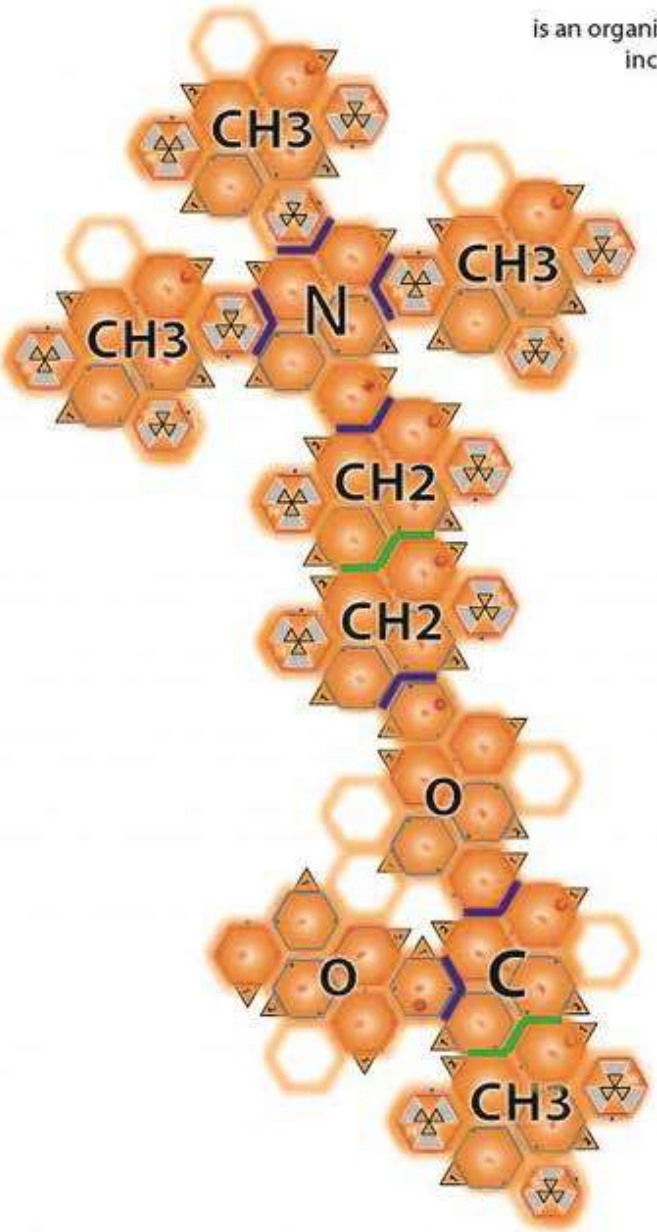
is an organic molecule that acts as a neurotransmitter in many organisms, including humans. It is an ester of acetic acid and choline

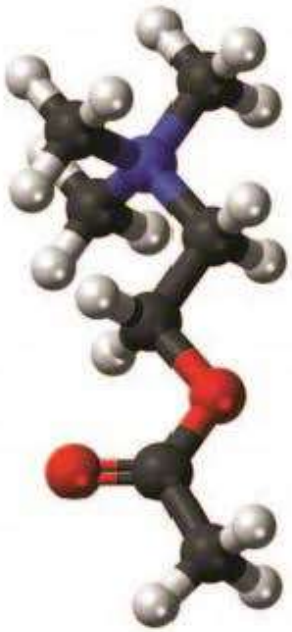
Tetryonic charge topology

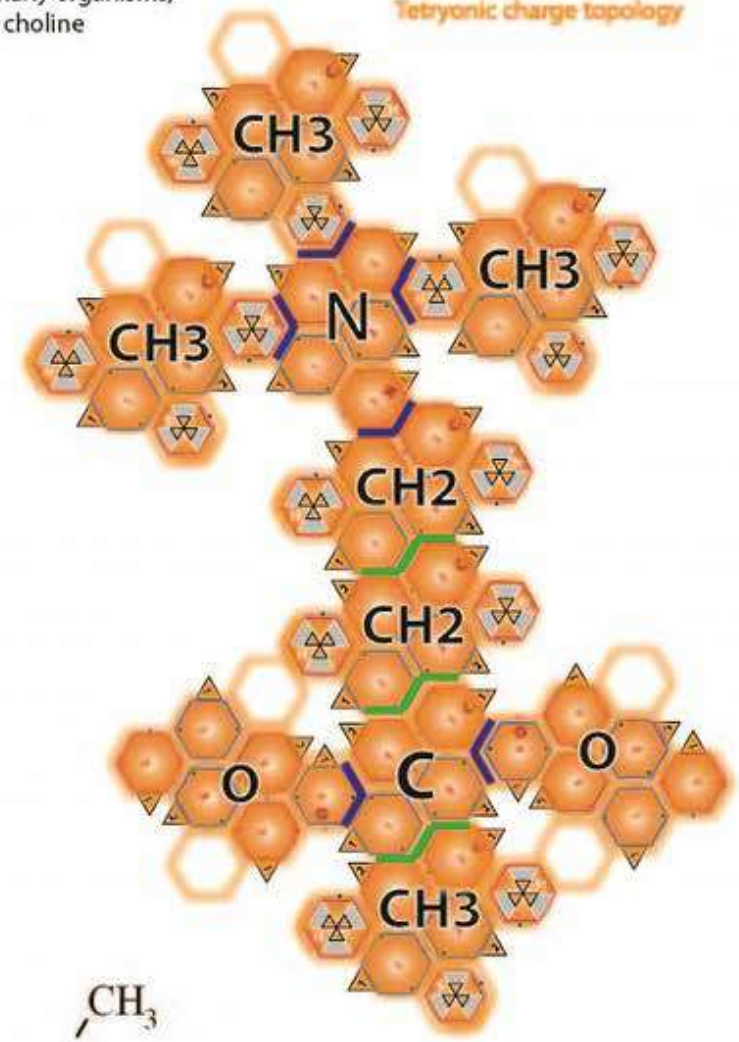
Ach

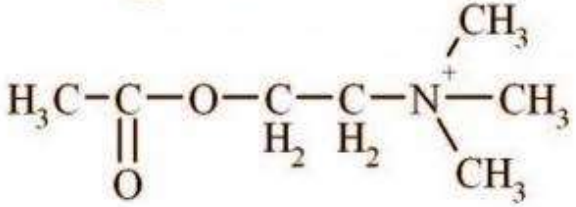
C7H16NO2

CH3COO(CH2)2N+(CH3)3









6,228

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Ribose

6,360

[3,180-3,180]

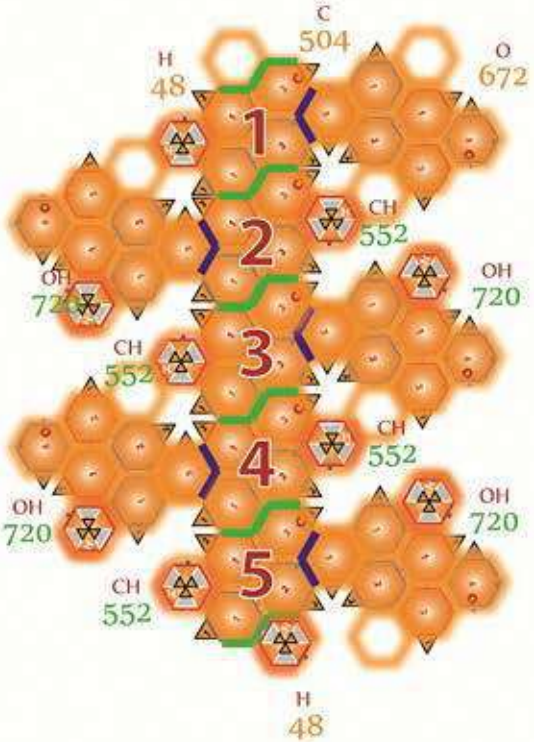
C5-H10-O5

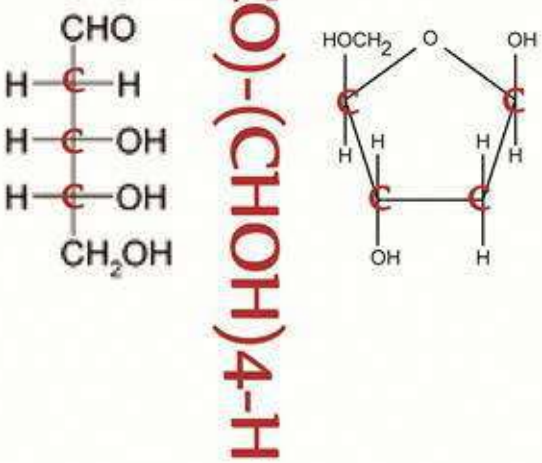
Carbohydrate compounds can form acyclic sugars

Carbohydrate compounds can also form cyclic sugars

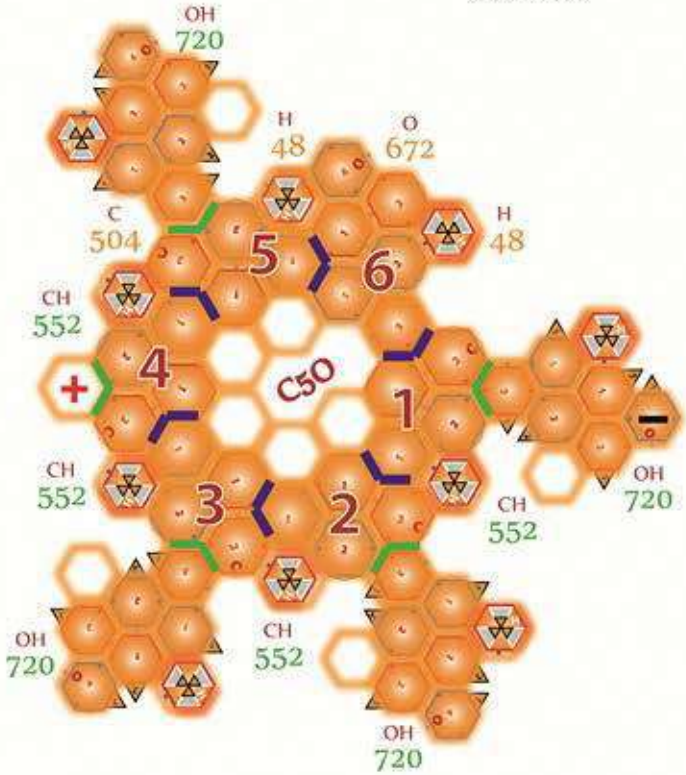
Ribose is an organic compound with the formula C5H10O5; specifically, a monosaccharide (simple sugar) with linear form H–(C=O)–(CHOH)4–H

C(H2O)5
ribose
C5-H10-O5





C(H2O)5
ribose
C5-H10-O5



Ribose forms part of the backbone of RNA.
It is related to deoxyribose, which is found in DNA.

Ribose is present within every living cell of the body and is used to manufacture ATP (the energy currency of the cell) from scratch. Whilst the body can manufacture its own ribose from glucose, this requires energy and is a very slow process.

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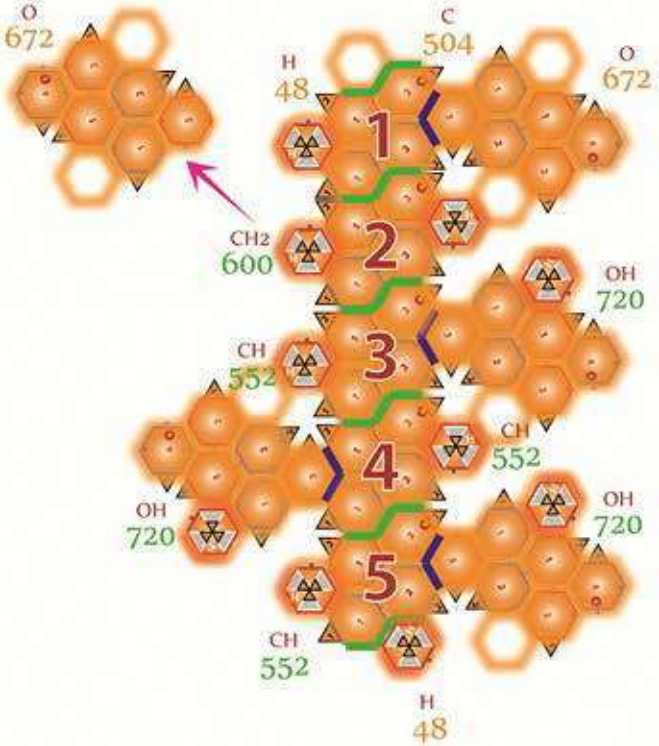
As its name indicates it is a deoxygenated sugar, meaning that it is derived from the sugar ribose by loss of an oxygen atom

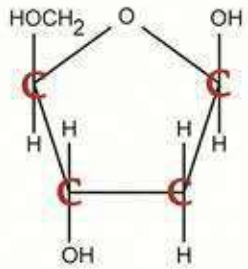
Deoxyribose

5,688
[2,844-2,844]

As a component of DNA, 2-deoxyribose derivatives have an important role in biology

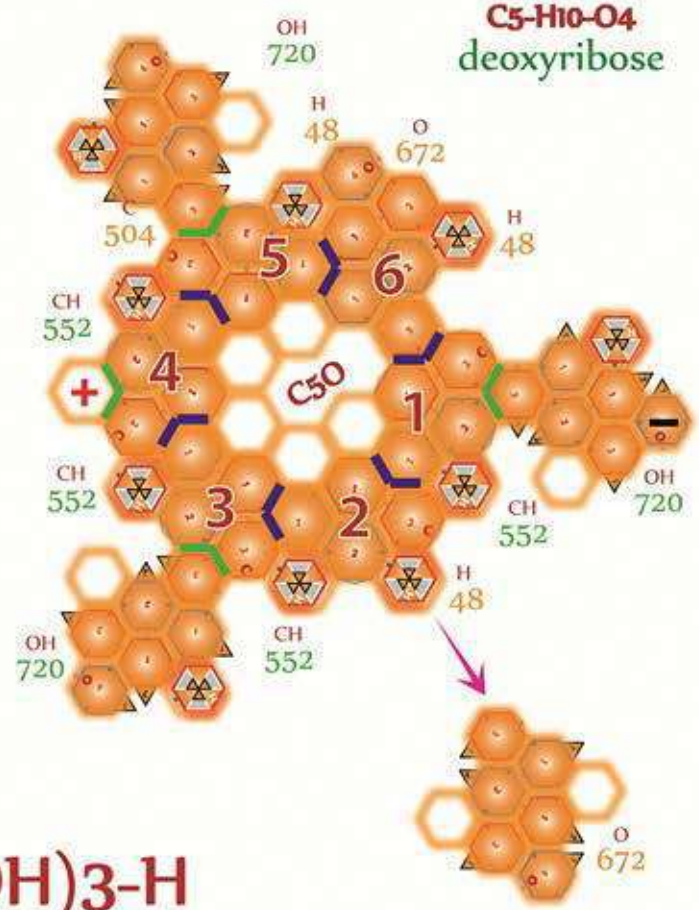
The DNA (deoxyribonucleic acid) molecule, which is the main repository of genetic information in life, consists of a long chain of deoxyribose-containing units called nucleotides, linked via phosphate groups





Deoxyribose, more, precisely 2-deoxyribose, is a monosaccharide

C5-H10-O4
deoxyribose



C5-H10-O4
deoxyribose

H-(CO)-(CH2)-(CHOH)3-H

Hermann Emil Fischer won the Nobel Prize in Chemistry (1902) for his work in determining the structure of the D-aldohexoses.

However, the linear, free-aldehyde structures that Fischer proposed represent a very minor percentage of the forms that hexose sugars adopt in solution. It was Edmund Hirst and Clifford Purves, in the research group of Walter Haworth, who conclusively determined that the hexose sugars preferentially form a pyranose, or six-membered, ring. Haworth drew the ring as a flat hexagon with groups above and below the plane of the ring – the Haworth projection

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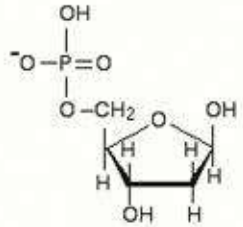
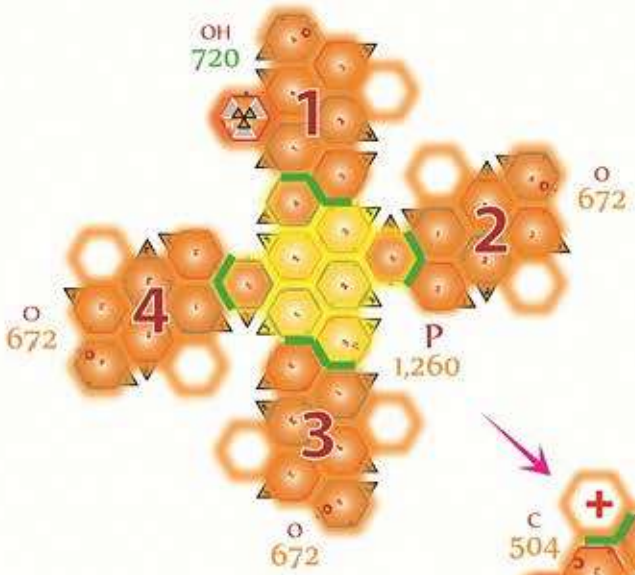
Phosporus

3,996
[1,998-1,998]

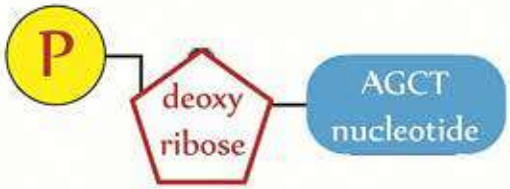
HPO4
phosphate
group

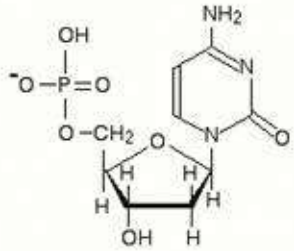




C5-H10-O4
deoxyribose

The other repeating part of the DNA backbone is a phosphate group.
A phosphate group is attached to the sugar molecule in place of the -OH group on the 5' carbon.





5,688
[2,844-2,844]

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The spectral line emissions of photons from bound electrons in addition to Alpha, Beta and Gamma Particle emissions from nuclei can release KEM energies over long time spans

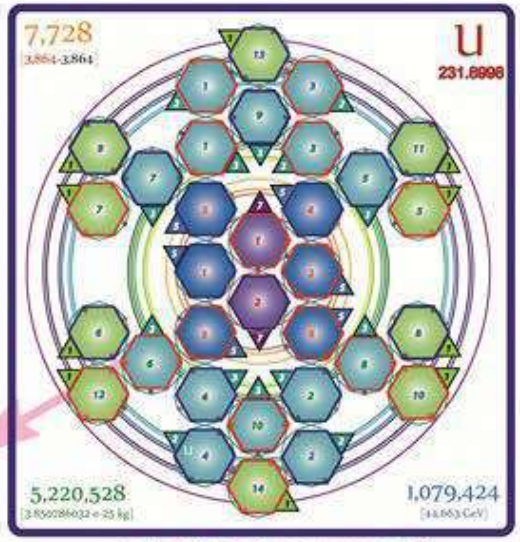
Radioactive Decay

The Atom releases excess energies in various forms as it seeks a lower energy, state of equilibria with its surrounding EM energy environment

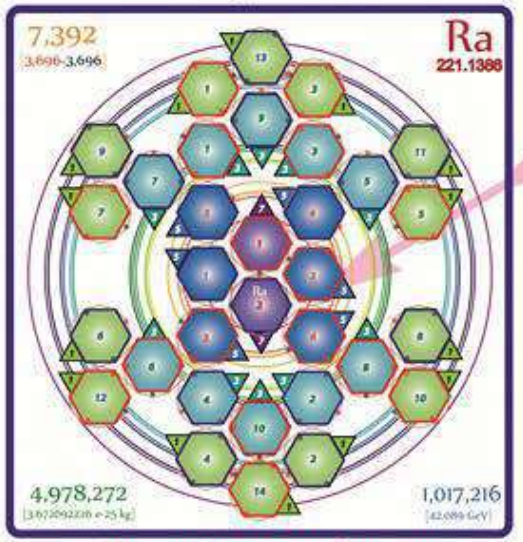
Energy in all its forms seeks equilibirium

Photons, Heat, Vibration & Kinetics can all raise the energy levels of atomic nuclei

E
scalar equilateral
mass-ENERGY-Matter
geometries topologies
mc^2 Mc^4



unstable high energy nuclei



stable core electron configurations

0
neutral charge Photons
γ

12
e-
- charge lepton

D^+
12
n5
N^0
P^+
+ charge nuclei
α

V_e
0
e+
12
Neutral leptons
+ charge lepton
β

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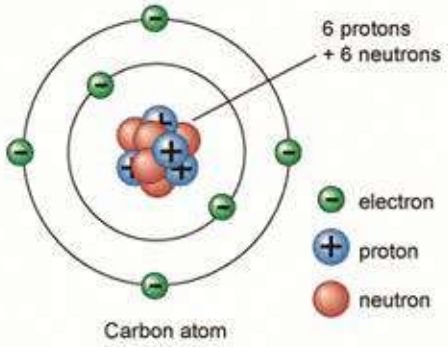
Radio-Carbon isotope dating

Radiocarbon dating (sometimes simply known as carbon dating) is a radiometric dating method that uses the naturally occurring radioisotope carbon-14 (14C) to estimate the age of carbon-bearing materials up to about 58,000 to 62,000 years

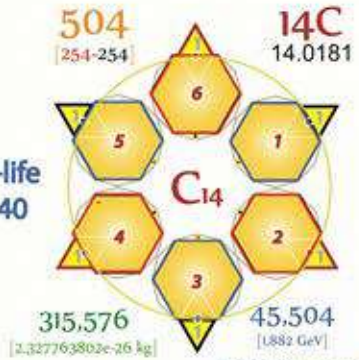


Standing-wave KE not 'excess' Neutrons

It is the stored Kinetic Energies [KE] that increase the mass of Carbon12 to create its isotopes, historically these mass-energies have been mistakenly thought to be extra Neutrons in the nuclei

[6 Deuterium nuclei]

ALL elemental Carbon atoms have an atomic configuration of 6 protons, 6 neutrons and 6 electrons



C14 half-life 5730 ± 40

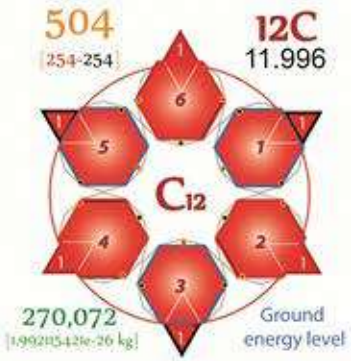
[2.0224 Neutrons]

Carbon-14, 14C, or radiocarbon, is a radioactive isotope of carbon with a nucleus containing 6 protons, 6 neutrons and 6 electrons with an excess energy content of 1.88 GeV

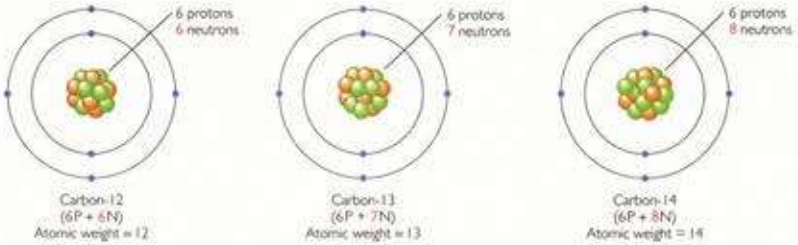
[.998 Neutrons]

Carbon-13, 13C, is a weakly radioactive isotope of carbon with a nucleus containing 6 protons, 6 neutrons and 6 electrons with an excess energy content of 920 MeV

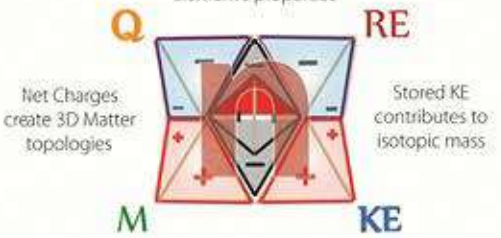
Radio-Carbon dating can be used to determine the age of carbonaceous materials up to about 60,000 years old



Tetryonic theory corrects historical errors of atomic geometries and nuclear energies



Isotopic mass-charge quotient determines an element's properties



The stored KE [chemical] mass-energies of the Carbon 12+ isotopes comes from various radiological [and biological] processes and its steady, predictable release through the quantum mechanics of the synchronous convertors that make up Carbon nuclei make it useful in dating objects based on their decay rates

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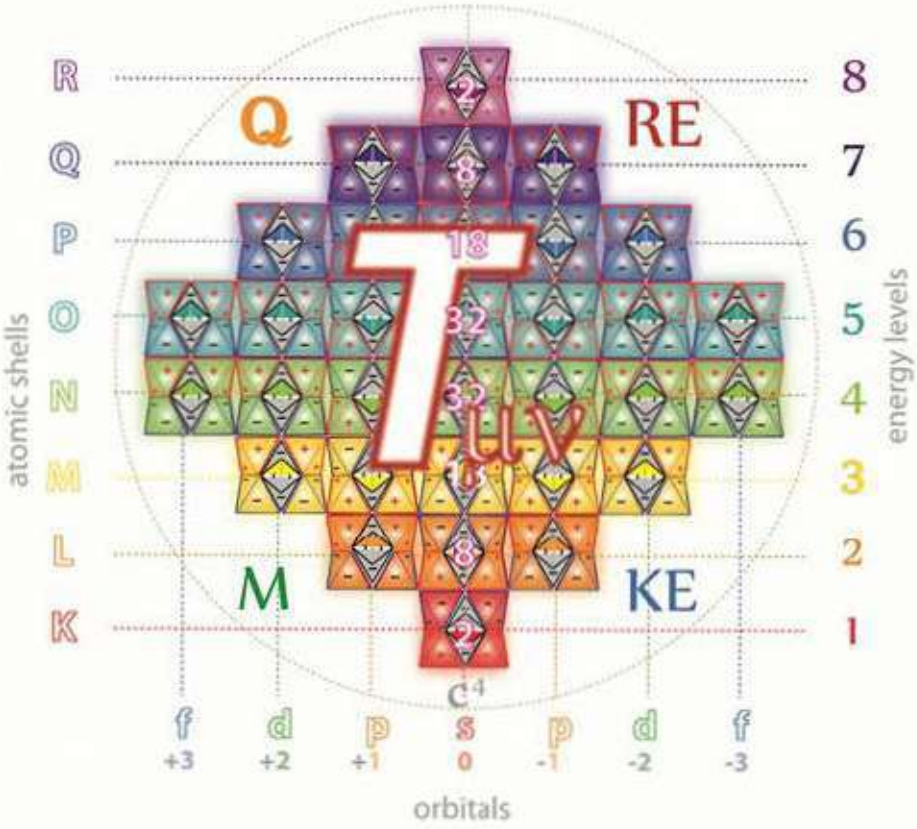
Radioactive Isotopes

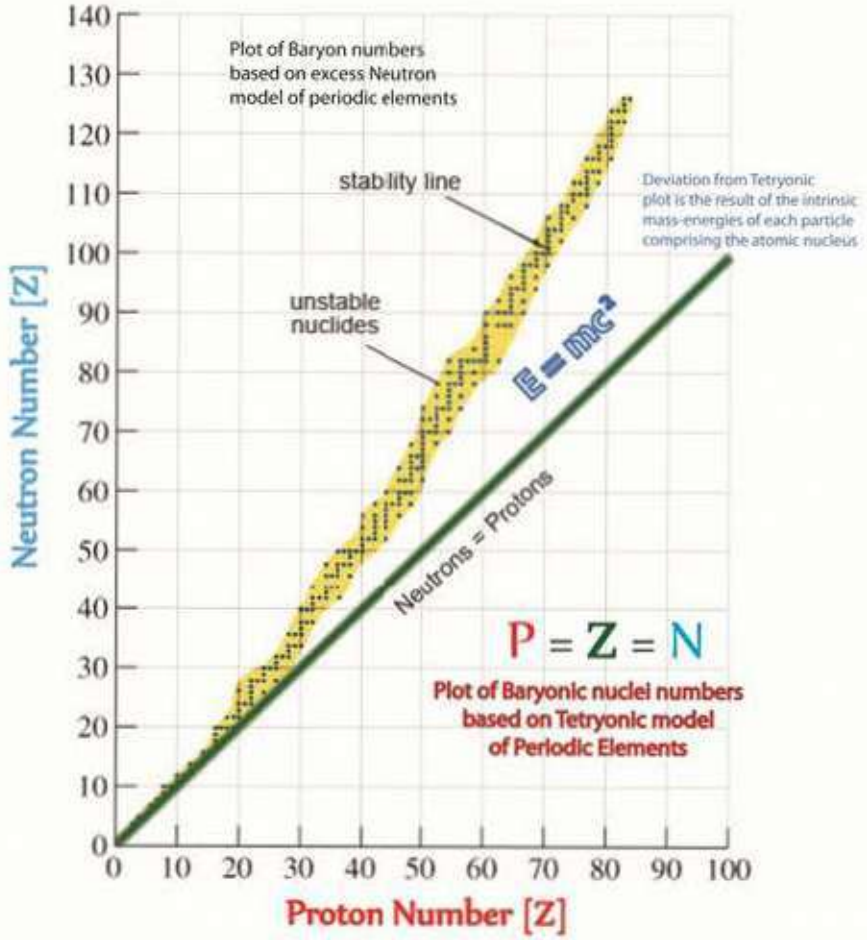
Where the elementary nuclei's Deuteron energy levels are raised from their ground levels radioactive isotopes are created



Each periodic element is comprised of an EQUAL number of Protons, Neutrons & electrons that form each element's unique 2D mass-energy geometries & 3D Matter topology and contribute to its observed properties

The mass/c² ~ energy/c⁴ content of Matter

Einstein's relativistic stress energy tensor models mass-energy-Matter as a nebulous energy-momenta density-pressure gradient



Tetryonic theory redefines the relativistic stress energy tensor [$T_{\mu\nu}$] into a geometric measure of the charged 2D electromagnetic mass-energies & 3D Matter topologies within any spatial co-ordinate system

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Nuclear Decay processes

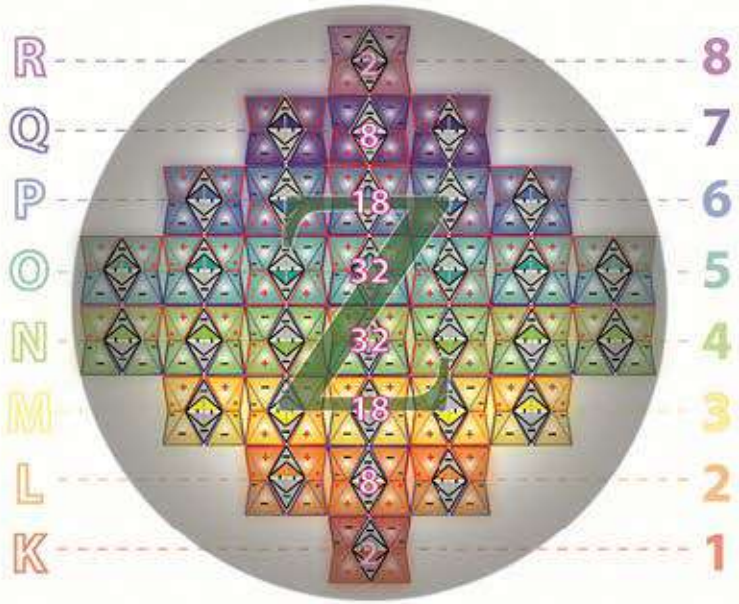
is the set of processes by which an unstable atomic nucleus emits subatomic particles

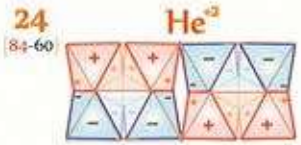
Charge & mass-energy momenta are conservative physical properties

Radioactivity was discovered in 1896 by the French scientist Henri Becquerel, while working on phosphorescent materials. These materials glow in the dark after exposure to light, and he suspected that the glow produced in cathode ray tubes by X-rays might be associated with phosphorescence

Charged Matter equivalence

Neutrogen $\nu e_{[6\text{-}6]} + N^0_{[18\text{-}18]} \sim^{[24\text{-}24]} P^+_{[24\text{-}12]} + e^-_{[0\text{-}12]}$ Hydrogen





alpha-particles

$D^+_{[42\text{-}30]} \; D^+_{[42\text{-}30]} \rightarrow He^{+2}_{[84\text{-}60]}$

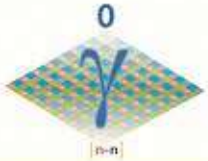
alpha particle production

E

Energy can be released from atomic nuclei through various processes

alpha-particles
beta-particles
gamma rays
spectral lines
heat & motion

beta-particles



gamma rays

Charge Matter particle creation follows chemical equilibrium formulae

$N^0_{[18\text{-}18]} \rightarrow e^+_{[12\text{-}0]} + \nu e_{[6\text{-}6]} + e^-_{[0\text{-}12]}$

Neutron decay processes

$N^0_{[18\text{-}18]} \rightarrow \nu e_{[6\text{-}6]} + \nu e_{[6\text{-}6]} + \nu e_{[6\text{-}6]}$

$KE_{[\nu\text{-}\nu]} \rightarrow \gamma_{[n\text{-}n]}$

gamma ray production

m *All nuclear decay particles are determined by Tetryonic charge topologies* M

3D Matter topologies are not conservative

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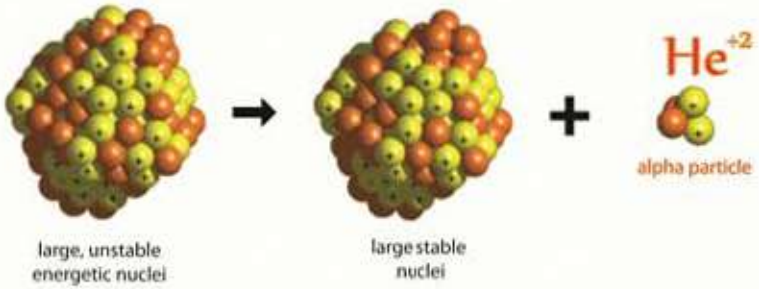
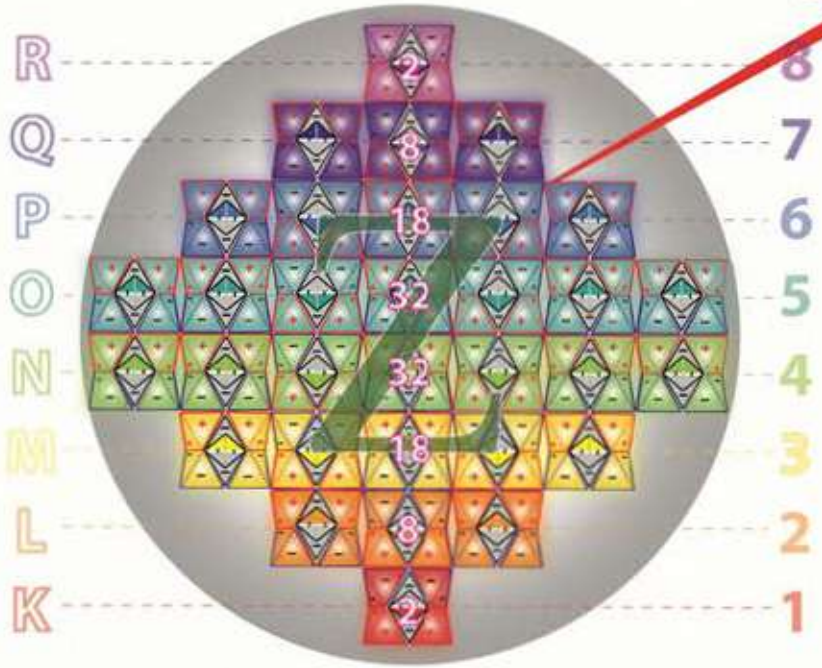
Alpha radiation

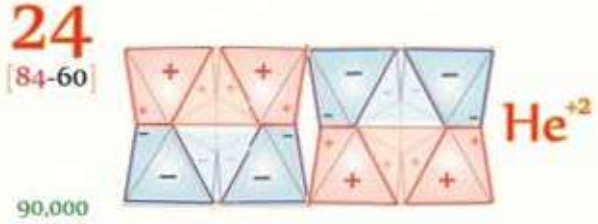
(Deuteron emissions)



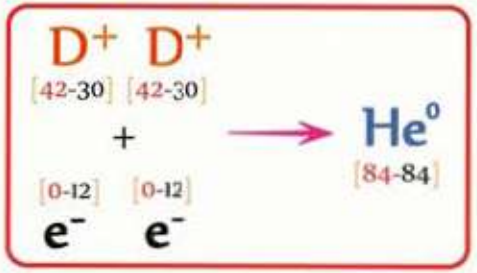
Alpha particles are released during alpha decay processes in ultra-heavy nuclei like uranium, thorium, actinium, and radium



Beta radiation - Negative charge sets (Nuclei)
Gamma radiation - Neutral Charge sets (Photons)

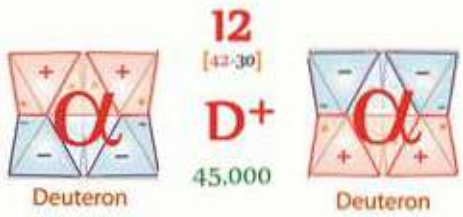


Helium nuclei creation

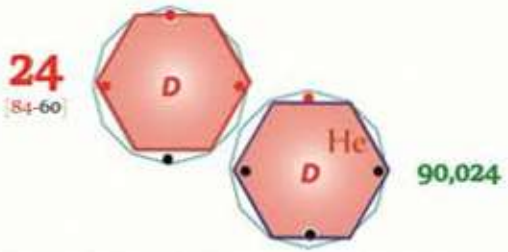


charged alpha nuclei bond & capture electrons to form neutral Helium

alpha particles



The radioactive isotope Americium 241 emits alpha particles which are used in smoke detectors.



Due to their larger masses compared to beta and gamma particles, alpha particles can be easily stopped by a piece of paper or human skin.

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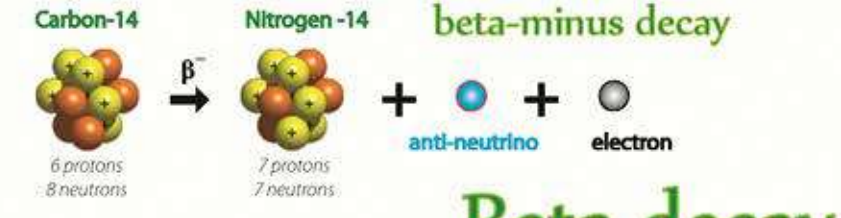
Beta particle decay

N^0 [18-18] → e^+ [12-0] + νe [6-6] + e^- [0-12]

Neutron decay paths

N^0 [18-18] → νe [6-6] + νe [6-6] + νe [6-6]

(the emission of leptons from atomic nuclei)



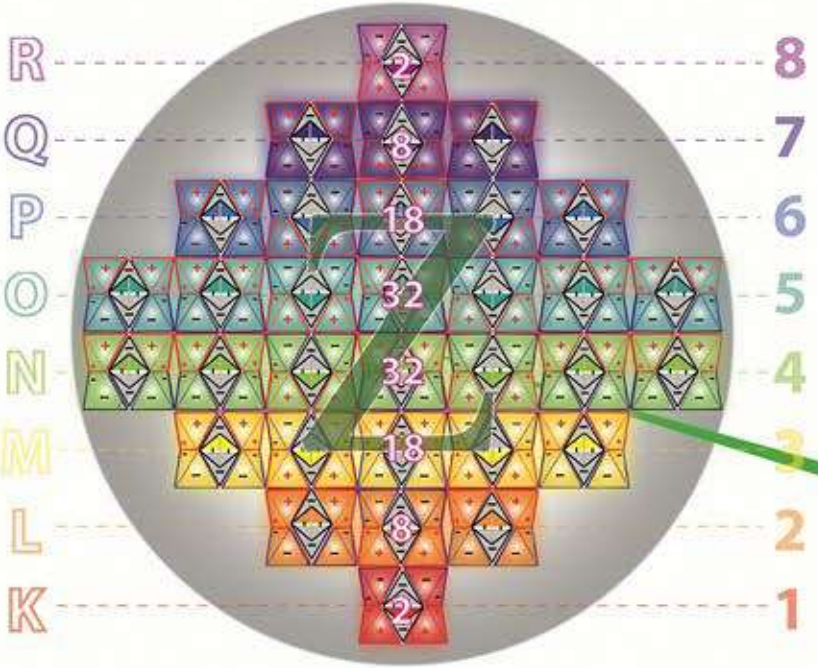
Beta decay

Charge is a conserved physical property of all material objects

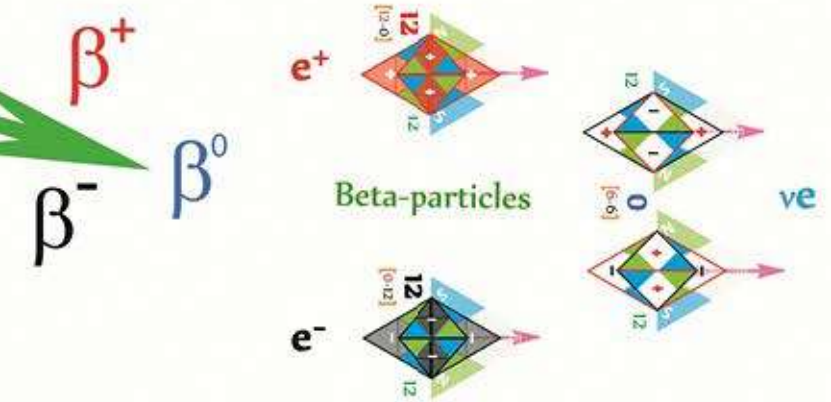
N^0 [18-18] + νe [6-6] → [24-24] P^+ [24-12] + e^- [0-12]

Neutron decay is not a spontaneous process

All beta decay processes are the result of neutrino interaction with Neutrons



Alpha radiation - Positive charge particles (Nuclei)
Gamma radiation - Neutral charge quanta (Photons)



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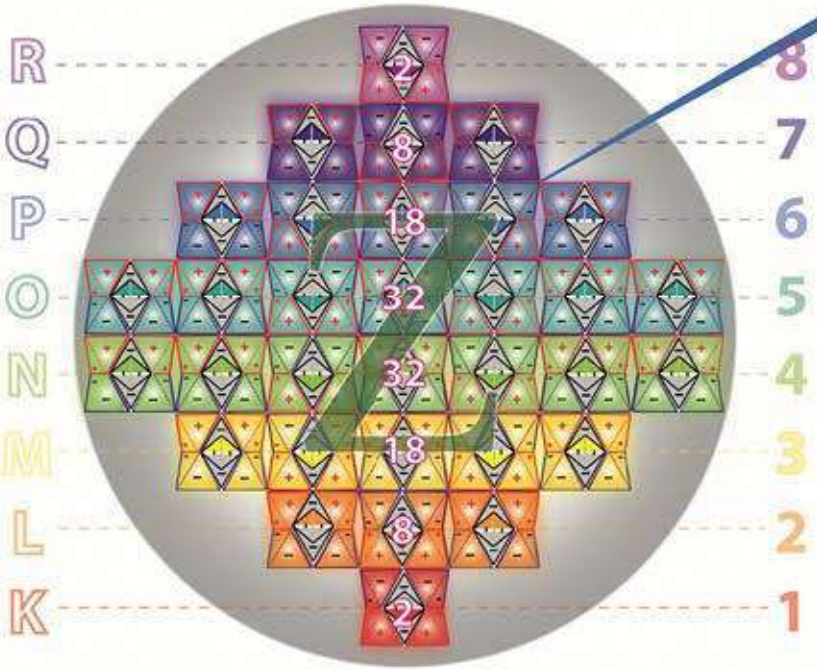
Gamma Radiation

(high energy photon emission)

Natural sources of gamma rays on Earth include gamma decay from naturally occurring radioisotopes, and secondary radiation from atmospheric interactions with cosmic ray particles.

All ejected gamma ray photons are neutral energy quanta sets [photons / EM waves]

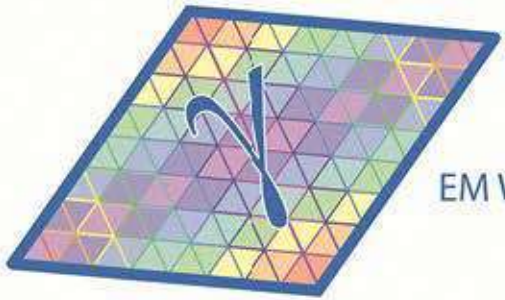
Gamma rays typically have frequencies above 10 exahertz (or >10^19 Hz), and therefore generally have energies above 100 keV and wavelengths less than 10 picometers (less than the diameter of an atom)



Alpha radiation - Positive charge particles (nuclei)
Beta radiation - Negative charge particles (leptons)

gamma rays

Gamma decay produces rays with energies of only a few hundred keV, and almost always less than 10MeV



$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{EM Field / ElectroMagnetic}}.\left[m\Omega v^2\right]_{\text{Planck quanta / mass / velocity}}\right]$$

Gamma rays are a form of ionizing radiation, and they have very good penetrating power. They result from the release of atomic energies and will cause biological damage to living tissue.

$$2h\nu = E = hf$$

Care must always be taken to distingush between charged Planck quanta [v] and photons [f]

gamma ray bursts

Baryon mass-Matter topology

N^0 [18-18] → [2.25 e23] [v-v]

$E = 2mc^2 = hf$

930 MeV 930 MeV

gamma ray mass-energy geometry

are the result of the stored KEM mass-energies of Matter topologies being released as mass-energy momenta geometries

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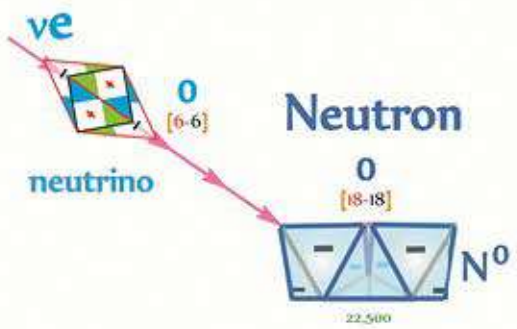
neutrino-Neutron Interactions

Neutrogen

$\nu e_{[6\text{-}6]} + N^0_{[18\text{-}18]} \overset{[24\text{-}24]}{\sim} P^+_{[24\text{-}12]} + e^-_{[0\text{-}12]}$

Charged Matter equivalence

Hydrogen



neutrino capture

Neutron decay is not the spontaneous process hypothesied by modern nuclear physicists

The observed decay products are the result of solar neutrinos interacting with Neutrons (both within nuclei and free)

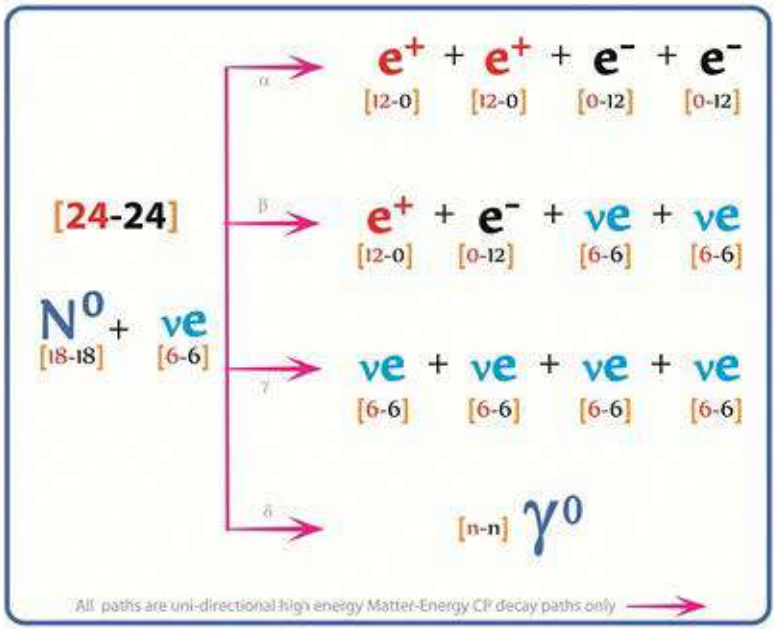
the neutrinos also have an equally likely probability of interacting with Protons in the nuclei

[24-24]

A Neutronium atom has an identical mass-charge quotient to that of Hydrogen **[24-24]**

Neutronium decay processes

A Neutron/neutrino interaction can decay into 4 differing particle sets


[24-24]
N⁰ [18-18] + νe [6-6]
α
e⁺ + e⁺ + e⁻ + e⁻
[12-0] [12-0] [0-12] [0-12]
β
e⁺ + e⁻ + νe + νe
[12-0] [0-12] [6-6] [6-6]
γ
νe + νe + νe + νe
[6-6] [6-6] [6-6] [6-6]
δ
[n-n] γ⁰
All paths are uni-directional high energy Matter-Energy CP decay paths only

Excluding their nett Charge, Neutrons have neutral particle geometries [18-18] identical to that of a Proton [24-12]

$N^0_{[18\text{-}18]} \neq P^+_{[24\text{-}12]} + e^-_{[0\text{-}12]}$ **[24-24]**

Spontaneous Neutron decay into Proton-electron-neutrinos is not possible without the interaction of Muonic neutrinos (see Tetryonic Charge numbers)

A Neutron is NOT a Proton that has absorbed an electron

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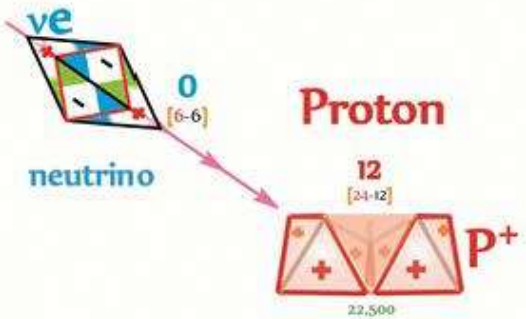
neutrino-Proton Interactions



Although very weakly interacting, neutrinos can still be attracted to and bind to Protons via their negative charge fascia

neutrino capture

Neutron decay is not the spontaneous process hypothesied by modern nuclear physicists

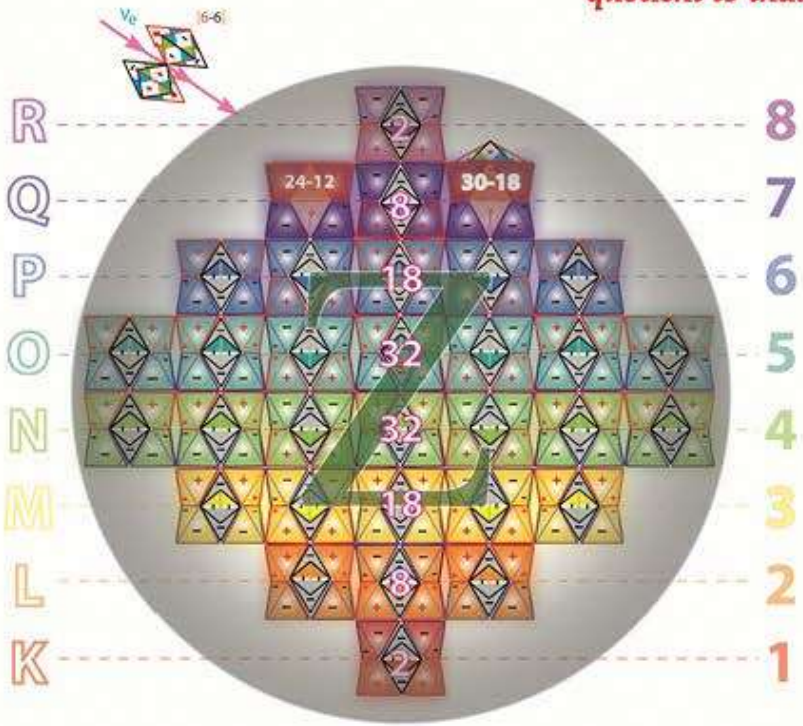
The observed decay products are the result of solar neutrinos interacting with Neutrons (both within nuclei and free)

the neutrinos also have an equally likely probability of interacting with Neutrons in the nuclei

[30-18]

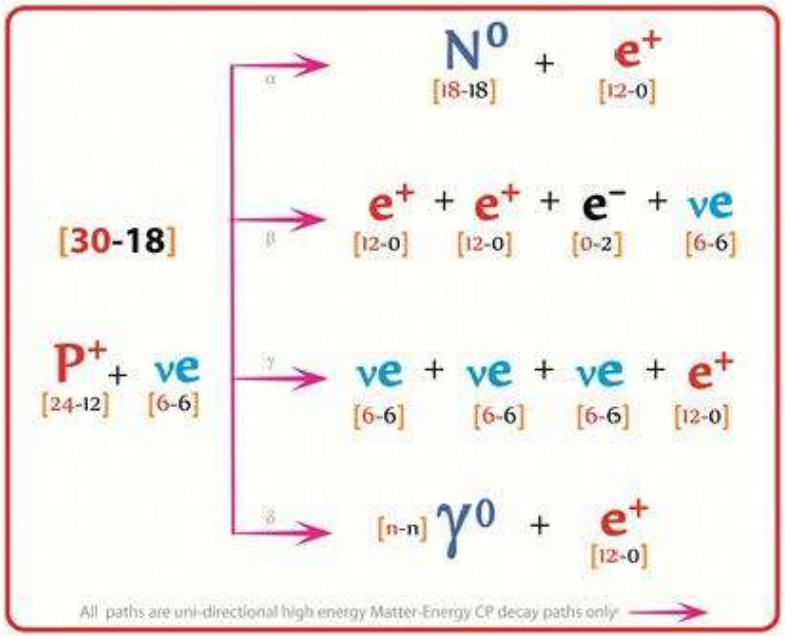
A Proton-neutrino atom would have an identical charge quotient to that of a Proton

[24-12]



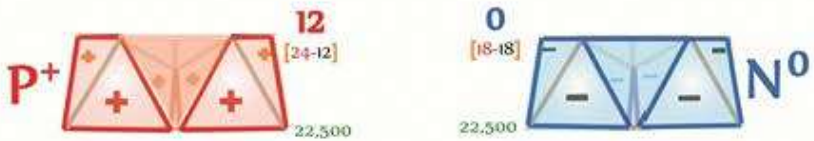
Proton decay paths

A Proton/Neutrino interaction can decay into 4 differing particle sets



If they exist, Proton-neutrino particle couplings would function in a manner identical to that of Proton-electron couplings and could be detected by the anomalous spin measurements that would result

A Proton has a Positive charge geometry [24-12] equivalent to that of a Neutral Neutron [18-18]



A Proton is topologically identical to a Neutron (differing only in the net charge created)

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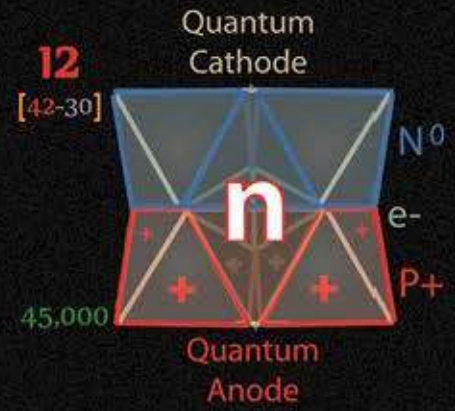
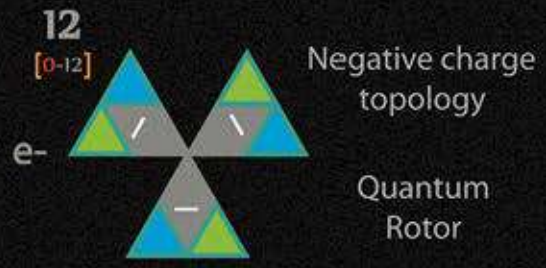
Quantum Batteries

Atomic nuclei can be easily scaled to non-quantum sizes to offer clean, safe and portable long term Energy storage devices that can store energy indefinitely and release it on demand anywhere in the World

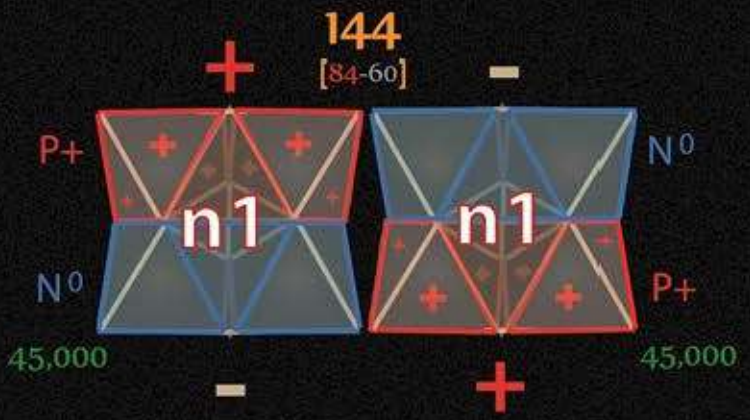


The quantum battery is unique in that in addition to storing energy indefinitely, when an electron binds to the Deuteron nuclei it has the ability to release specific energies [photons] by way of its quantum-scale synchronous converter topologies



12 loop quantum inductive rotor

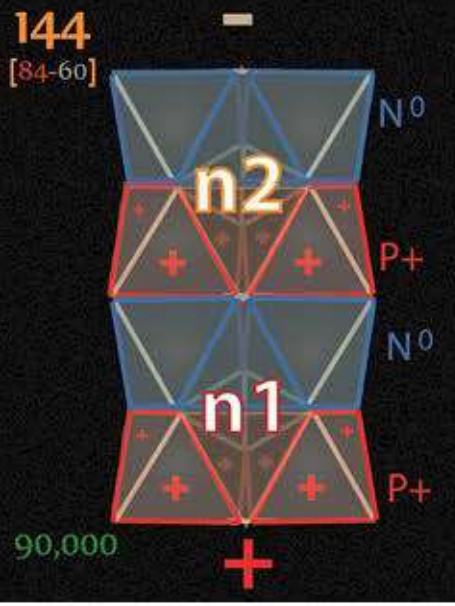
(Atomic Nuclei)



anti-Parallel Configuration

Synchronous quantum converter topologies can be connected in parallel or series to meet varying power requirements anywhere in the World and provides for the safe storage of nuclear energy as mass

Series Configuration



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Quantum synchronous Converters

Energy can be stored in macro-scaled quantum converters as mass

The electron has a charged Tetryonic Matter topology that is electrically equivalent to a 6 loop inductive rotor

Quantum Cathode

Quantum Anode

$$\text{Energy} = \frac{12\pi}{c^4}\left[\left[\underbrace{m\Omega v^2}_{\text{Planck quanta}}\right]^{n8}\right]^{n1}_{\text{momenta}}$$

(mass, velocity)

Matter is radiant EM energy in a standing-waveform

$$\text{Energy} = \frac{72\pi}{c^4}\left[\left[\underbrace{m\Omega v^2}_{\text{Planck quanta}}\right]^{n32}\right]^{n25}_{\text{momenta}}$$

Nuclei

(mass, velocity)

Building on the charged topology of Deuterium nuclei, scaled electromechanical quantum converters can be manufactured to provide efficient electrical mass-energy storage & distribution devices

$$\text{Energy} = \frac{84\pi}{c^4}{}^{n32}_{n25}\left[\left[\underbrace{m\Omega v^2}_{\text{Planck quanta}}\right]^{n8}\right]^{n1}_{\text{momenta}}$$

Deuterons

(mass, velocity)

These devices can be transported any where demand requires them worldwide with their energies stored in the form of mass

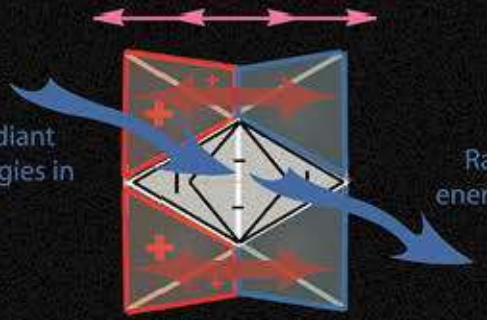
Negating the need for centralised power stations and distribution lines extending vast distances to provide power to remote communities

A quantum synchronous converter can store and release 3 forms of energy

Angular Momentum (motional energy)
square root linear momentum

Radiant Energy (emission/absorption)
of photon/boson mass-energy geometries

EM mass-Matter (stored masses in Matter topologies)
radiant EM mass-energies stored in standing wave Matter topologies



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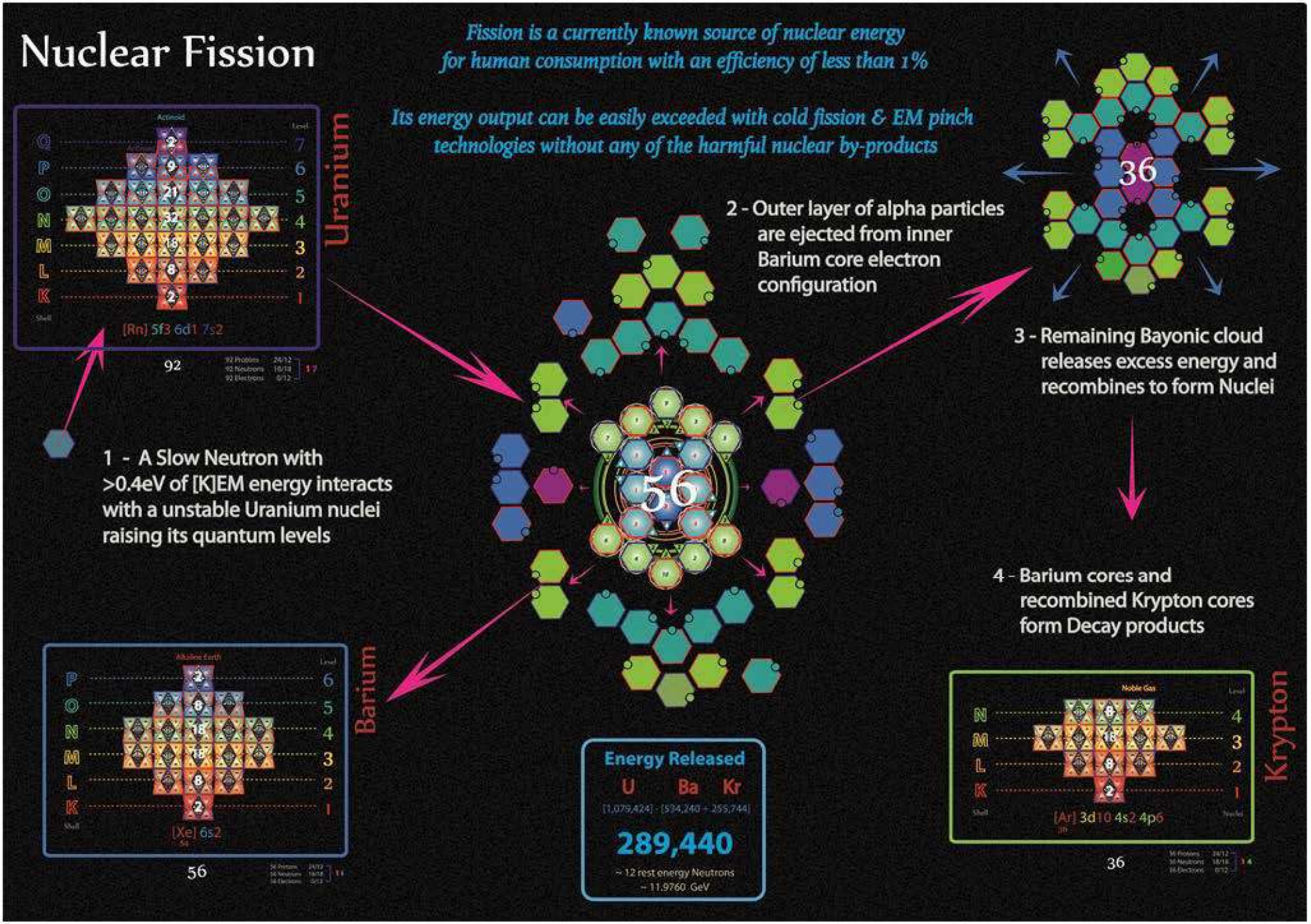
Nuclear Fission
Fission is a currently known source of nuclear energy for human consumption with an efficiency of less than 1%
Its energy output can be easily exceeded with cold fission & EM pinch technologies without any of the harmful nuclear by-products
Uranium
[Rn] 5f3 6d1 7s2
92
1 - A Slow Neutron with >0.4eV of [K]EM energy interacts with a unstable Uranium nuclei raising its quantum levels
2 - Outer layer of alpha particles are ejected from inner Barium core electron configuration
3 - Remaining Bayonic cloud releases excess energy and recombines to form Nuclei
4 - Barium cores and recombined Krypton cores form Decay products
Barium
[Xe] 6s2
56
Krypton
[Ar] 3d10 4s2 4p6
36
Energy Released
U Ba Kr
[1,079,424] - [534,240 + 255,744]
289,440
~ 12 rest energy Neutrons
~ 11.9760 GeV

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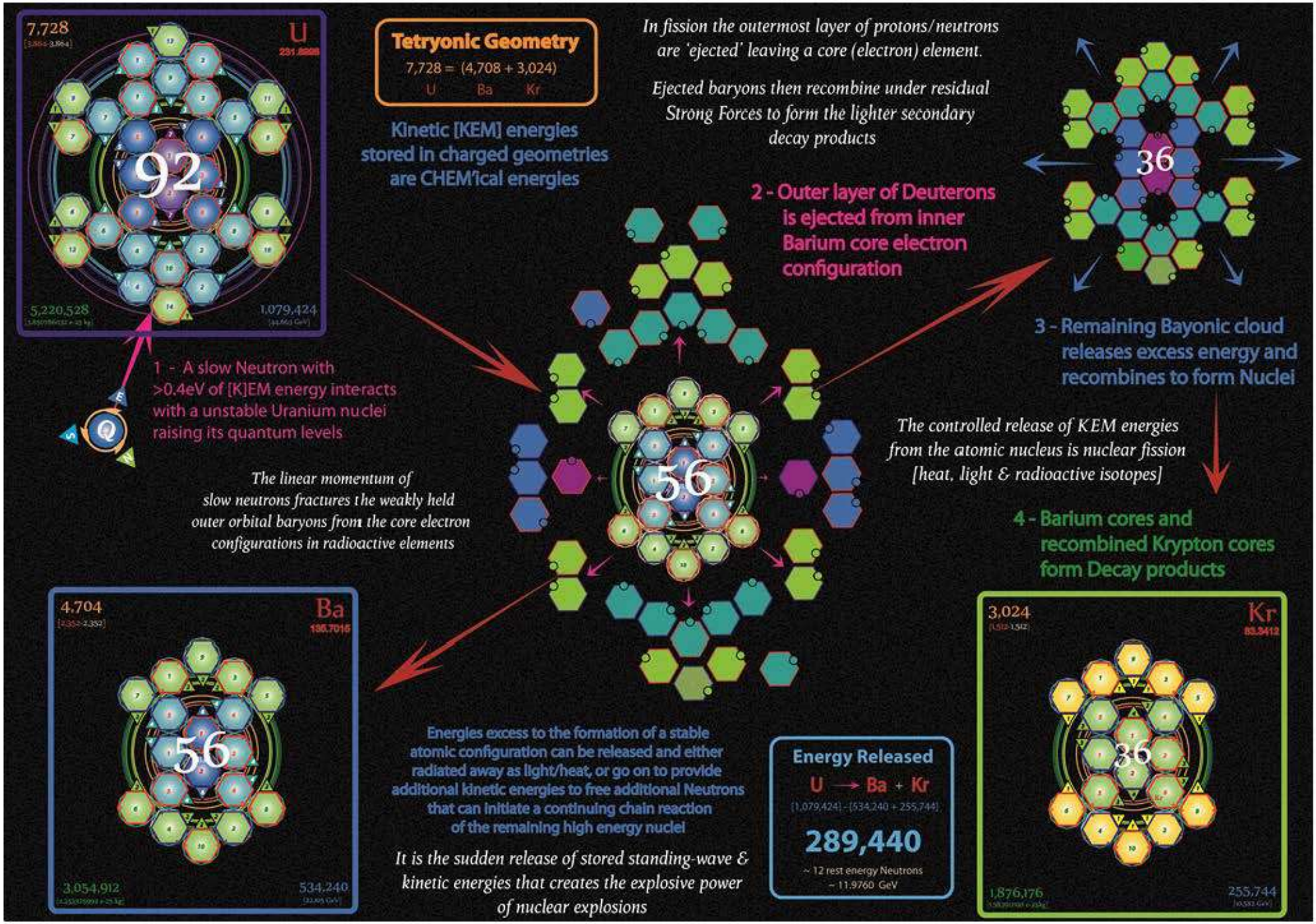
7,728
U
92
5,220,528
1,079,424
Tetryonic Geometry
7,728 = (4,708 + 3,024)
U Ba Kr
Kinetic [KEM] energies stored in charged geometries are CHEM'ical energies
In fission the outermost layer of protons/neutrons are 'ejected' leaving a core (electron) element.
Ejected baryons then recombine under residual Strong Forces to form the lighter secondary decay products
36
2 - Outer layer of Deuterons is ejected from inner Barium core electron configuration
3 - Remaining Bayonic cloud releases excess energy and recombines to form Nuclei
1 - A slow Neutron with >0.4eV of [K]EM energy interacts with a unstable Uranium nuclei raising its quantum levels
56
The linear momentum of slow neutrons fractures the weakly held outer orbital baryons from the core electron configurations in radioactive elements
The controlled release of KEM energies from the atomic nucleus is nuclear fission [heat, light & radioactive isotopes]
4 - Barium cores and recombined Krypton cores form Decay products
4,704
Ba
56
3,054,912
534,240
3,024
Kr
36
1,876,176
255,744
Energies excess to the formation of a stable atomic configuration can be released and either radiated away as light/heat, or go on to provide additional kinetic energies to free additional Neutrons that can initiate a continuing chain reaction of the remaining high energy nuclei
It is the sudden release of stored standing-wave & kinetic energies that creates the explosive power of nuclear explosions
Energy Released
U → Ba + Kr
[1,079,424] - [534,240 + 255,744]
289,440
~ 12 rest energy Neutrons
~ 11.9760 GeV

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Sonoluminescence

Sonoluminescence is the first hint at the energies that can be released from Tetryonic collapse and involves the emission of short bursts of light from imploding bubbles in a liquid when excited by sound.

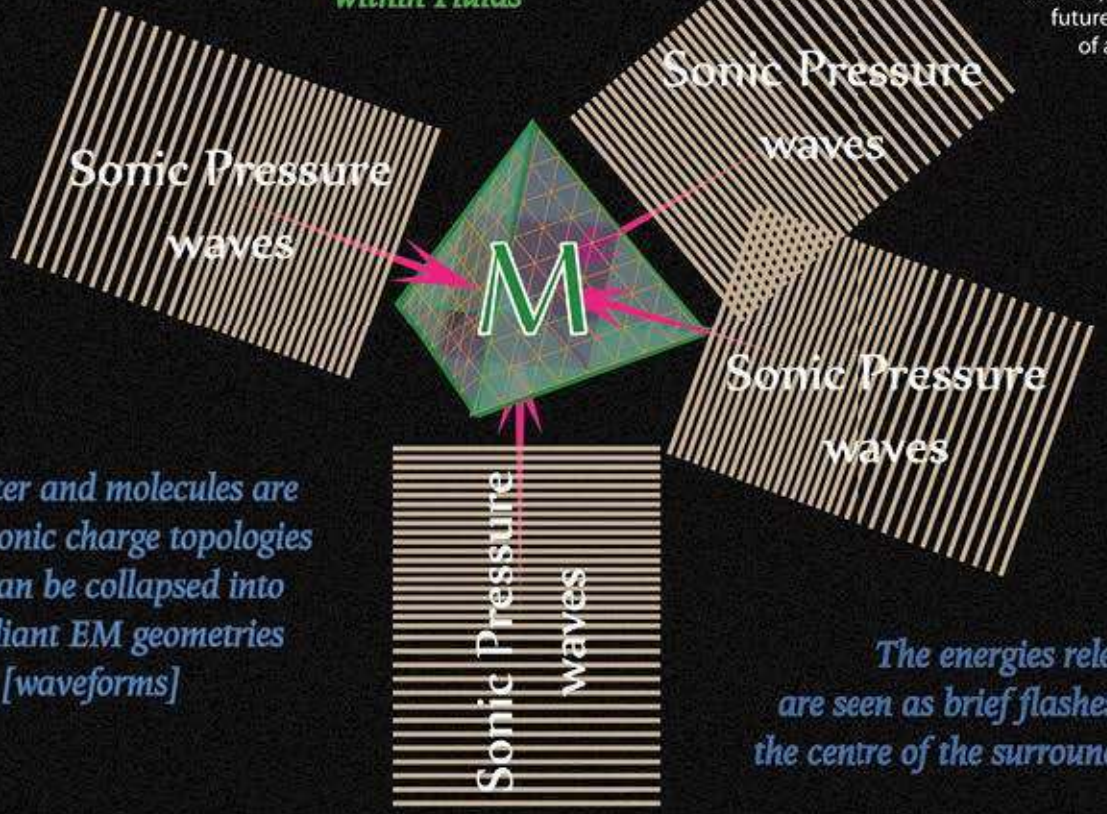
It is a key step on the road to realising technologies that can provide Humanity with clean, safe, efficient Energy production through the conversion of Matter into various forms of EM radiation

The production of light as a result of the passing of sound waves through a liquid medium.

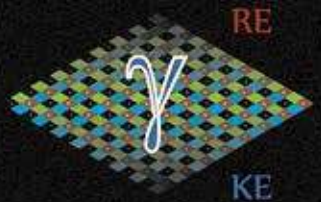
The sound waves cause the formation of bubbles that emit bright flashes of light when they collapse.

Sonoluminesence is the result of energy releases from the collapse of standing-wave Matter topologies within Fluids

Finding an efficient means of inducing and managing a controlled reaction where 3D Matter topologies are converted into 2D radiant energy is a key step on the path to creating a future energy source of all Humanity



The gauge transformation of Matter into EM radiation is the most efficient form of energy release available to us



All Matter and molecules are 3D Tetryonic charge topologies which can be collapsed into 2D radiant EM geometries [waveforms]

The energies released are seen as brief flashes of light at the centre of the surrounding medium

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Cold Fission

Stanley Pons (23 August 1943) Martin Fleischmann (29 March 1927 – 3 August 2012)

'Nuclear fusion of the type postulated would be inconsistent with current understanding and, if verified, would require theory to be extended in an unexpected way'

The reported excess energy released is often refused as being impossible as it woud require the release of massive neutron radiation bath.

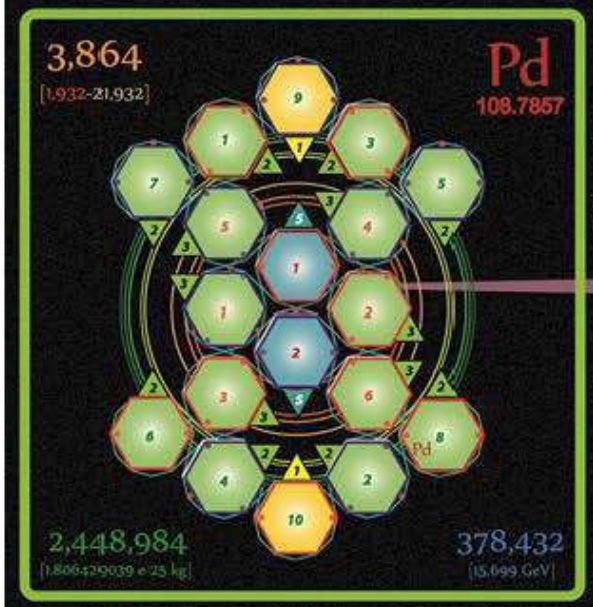
Atomic nuclei can easily release the reported energies without Neutron particle emissions when an accurate model of the atomic nuclei is used

'Fusion' is a fictious nuclear process
'cold fusion' is in fact a form of nuclear fission

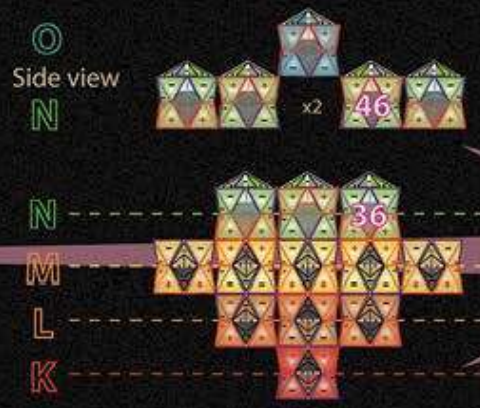
Palladium's rest molar mass is 108.7867 with a stored Kinetic energy content of 15.699 Gev [16 neutron equivalence]

Expelling the non-core atomic nuclei results in a release of stored KEM energies as the deuterium nuclei seek to reach a ground energy level state

Krypton's rest molar mass is 83.3412 with a stored Kinetic energy content of 10.582 Gev [11 neutron equivalence]



Palladium



2 x n5
10 Deuterons
8 x n4
122,688
[5.076 GeV]
Energy equivalent to 5+ Neutrons

NO excess Neutrons are ever released
~ only stored KEM energies and alpha particles

Krypton

[Kr] 4d8 5s2 — Transition Metal — 46 Protons 24-12 / 46 Neutrons 18-18 / 46 Electrons 0-12 — 1 5

[Ar] 3d10 4s2 4p6 — Noble Gas — 36 Protons 24-12 / 36 Neutrons 18-18 / 36 Electrons 0-12 — 1 4

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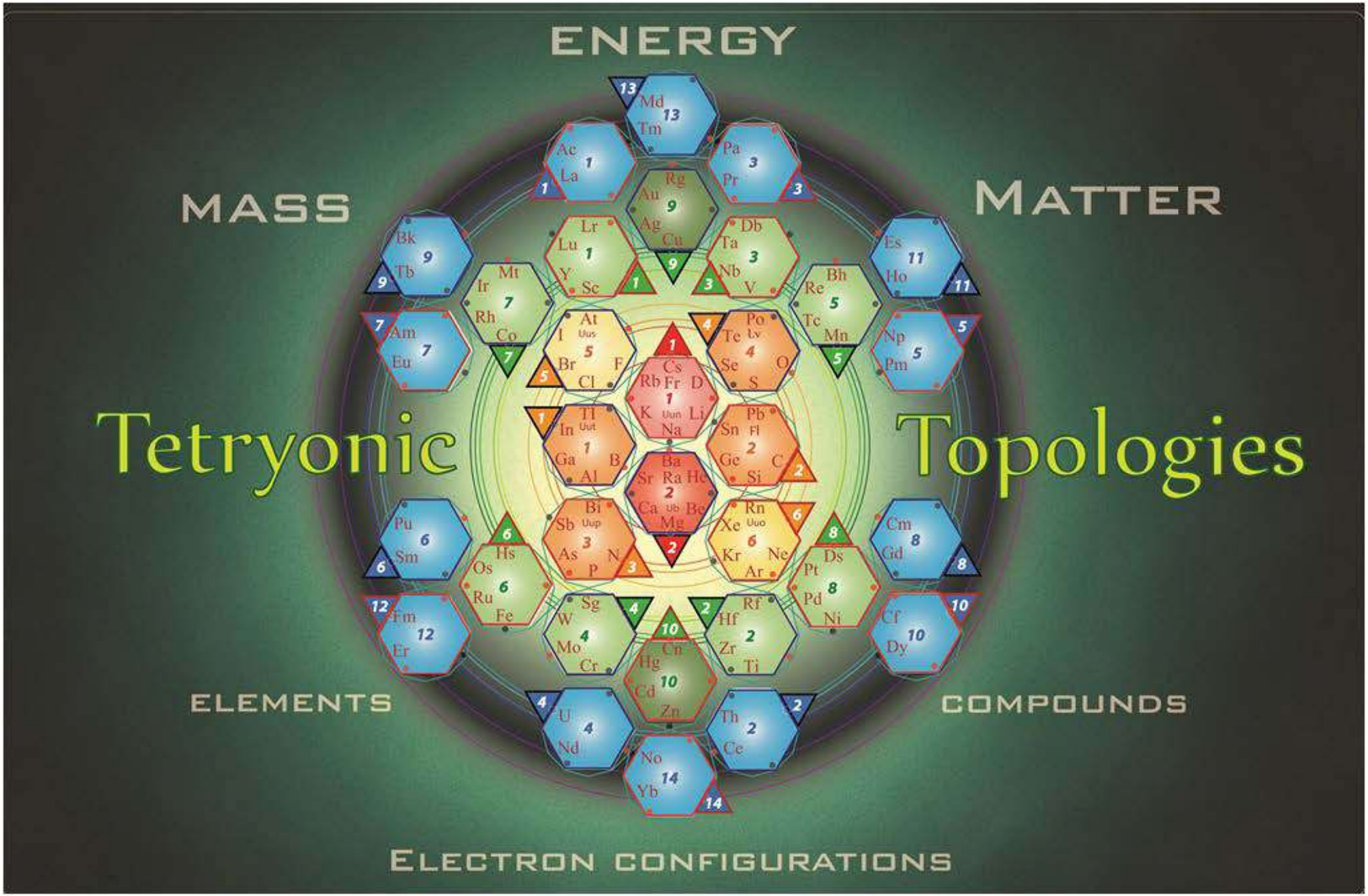

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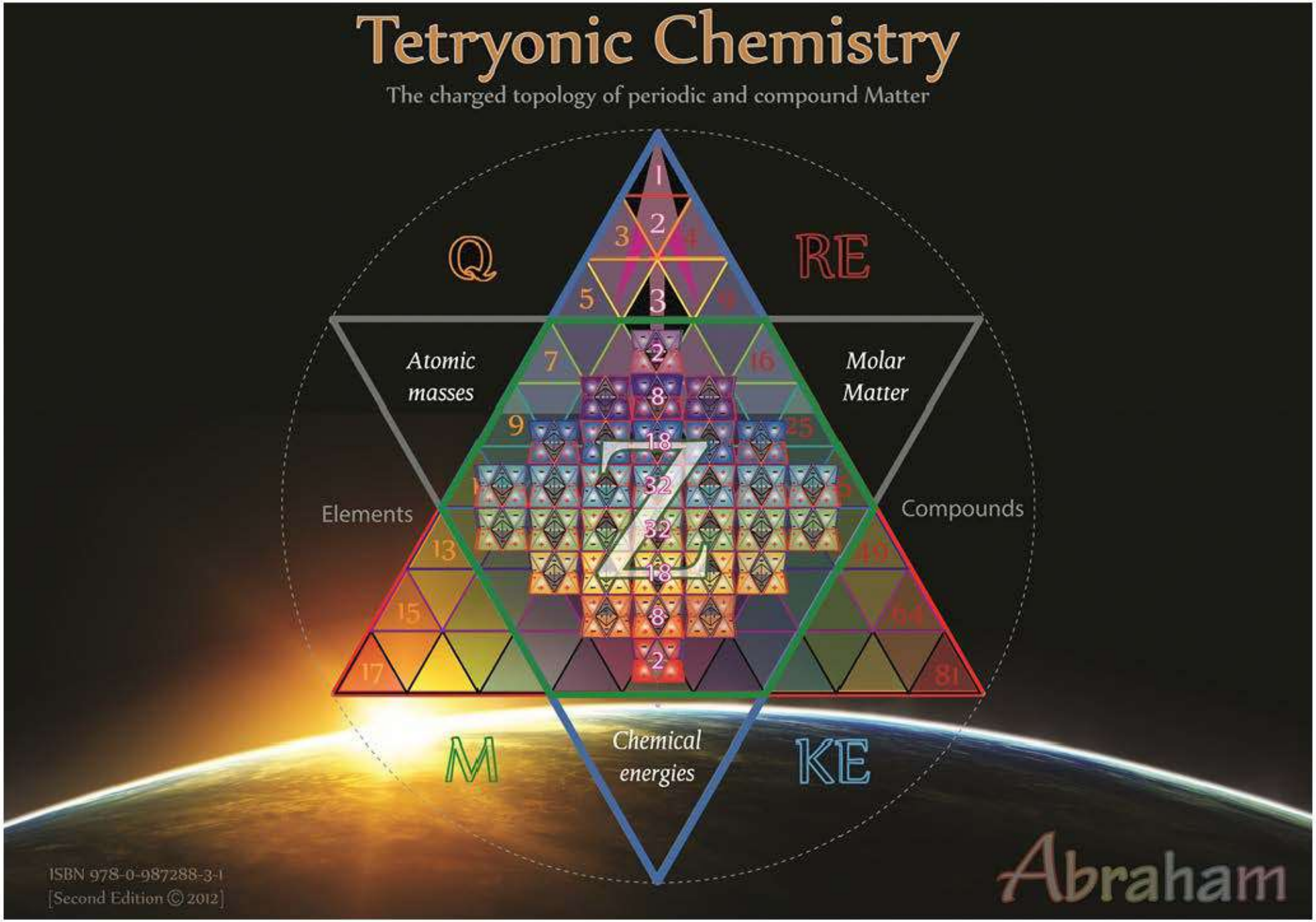

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TETRYONICS

The charged interactions of universal Gravitation

Foundational Quantum Cosmology

Abraham

ISBN 978-0-987288-4-8
[Second Edition © 2012]

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Laws of Force

$F = ma$

Sir Issac Newton

(25 December 1642 – 20 March 1727)

$w = mg$

Gravity

changing Magnetic lines of Force

Michael Faraday

(22 September 1791 – 25 August 1867)

create changing Electric fields of Force

Newton's Principia formulated the laws of motion and of universal gravitation

Faraday discovered the principles of electromagnetic induction, diamagnetism, and the laws of electromagnetism.

Electro-Magnetism

$$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0}$$

Gauss

Light is an electromagnetic wave

Faraday

$$\oint \vec{E} \cdot \vec{ds} = -\frac{d\Phi_B}{dt}$$

James Clerk Maxwell

(13 June 1831 – 5 November 1879)

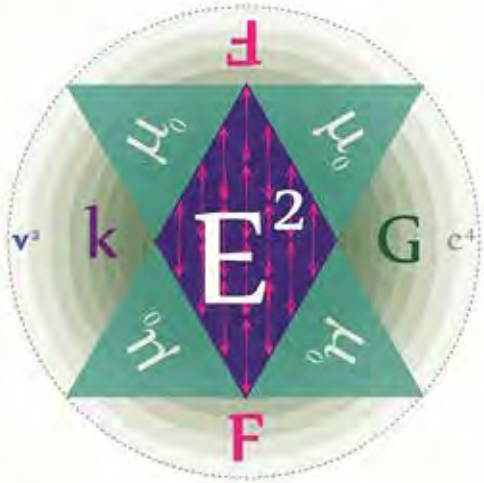
$$\oint \vec{B} \cdot d\vec{A} = 0$$

Gauss

The separate works of Gauss, Ampere & Faraday were unified to create an electromagnetic wave field theory

Ampere

$$\oint \vec{B} \cdot \vec{ds} = \mu_0 i + \frac{1}{c^2}\frac{\partial}{\partial t}\int \vec{E} \cdot d\vec{A}$$



Lorentz Contraction

Lorentz proposed that moving bodies contract in the direction of motion (Lorentz–Fitzgerald contraction)

Hendrik Lorentz

(18 July 1853 – 4 February 1928)

Lorentz Transformations

Special Relativity

atiempted to explain the constant speed of Light using relative motion & Lorentz contractions

Albert Einstein

(14 March 1879 – 18 April 1955)

&

later attempted to explain gravity as a curvature of spacetime caused by Matter

General Relativity

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Early physics of Motion

In the 4th century BC, the Greek philosopher Aristotle believed that there is no effect or motion without a cause

In Book VII of his De Architectura, the Roman engineer and architect Vitruvius contends that gravity is not dependent on a substance's "weight" but rather on its "nature".

The cause of the downward motion of heavy bodies, such as the element earth, was related to their nature, which caused them to move

In the 7th Century the Indian mathematician Brahmagupta stated "Bodies fall towards the earth as it is in the nature of the earth to attract bodies, just as it is in the nature of water to flow."

Greek philosopher Aristotle

(384 BC – 322 BC)

Aristotle defined space to be the boundary geometry of a body

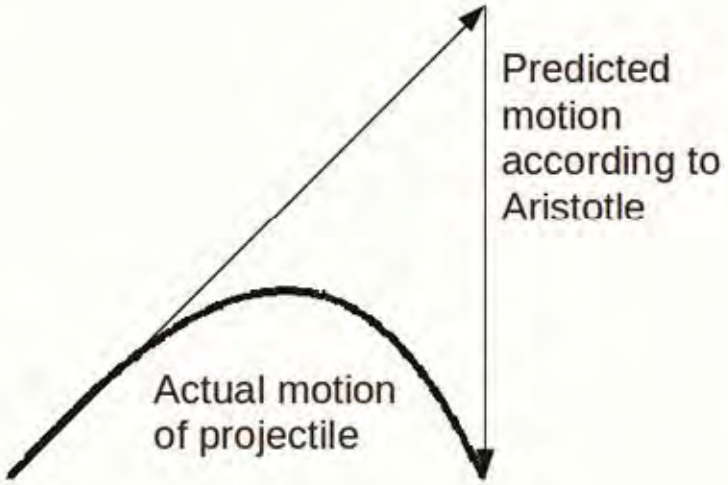
[x,y,z]

geometry, toplogy

Aristotle defined time to be a measure of movement

the past Δ the future

'Nature abhors a vacuum'



Heavier things fall faster, with speed being proportional to weight.

The speed with which a body falls is inversely proportional to the density of the medium it is falling through.

Indian Mathematician Brahmagupta

(597–668 AD)

Brahmagupta dedicated a substantial portion of his work to geometry

Brahmagupta is considered the first to formulate the concept of zero

negative numbers **0** positive numbers

Brahmagupta introduced new algebric methods for solving quadratic equations

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Galilean Gravity

Galileo Galilei

(15 February 1564 – 8 January 1642)

Galileo claimed to have a Universal Law of Gravitation
covering both terrestrial gravity and the motion of planets
which he was afraid to discuss.

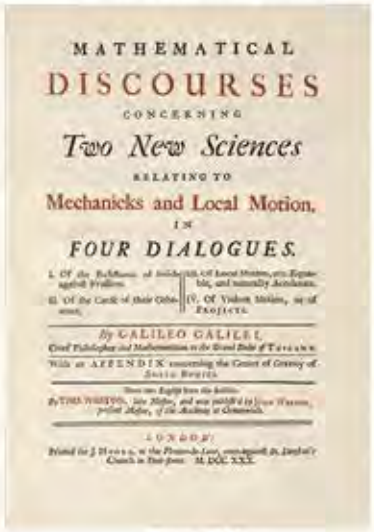
But this looks more an inspired aspiration than a reality,
as he seems not to have considered gravitational force as
decreasing with distance from its source.

He did however, definitively show that objects experience a uniform
acceleration in a gravitational field (irrespective of their masses)
which was central to Newton's later Universal Law of Gravitation

Galileo dismissed as a "useless fiction" the idea, held by his contemporary Johannes Kepler, that the moon caused the tides.

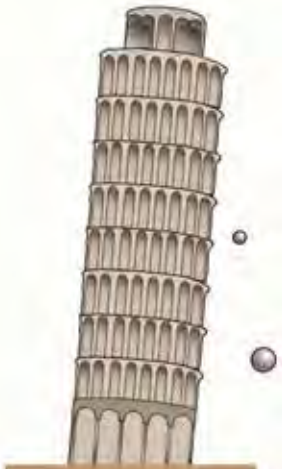
Galileo also refused to accept Kepler's elliptical orbits of the planets, considering the circle the "perfect" shape for planetary orbits.

The Motion of Falling Bodies


MATHEMATICAL
DISCOURSES
CONCERNING
Two New Sciences
RELATING TO
Mechanicks and Local Motion,
IN
FOUR DIALOGUES.
By GALILEO GALILEI,
LONDON:

(ca. 1590)

Galileo was the first to counter Aristotle's earlier idea's of motion by teaching that
All objects experience a uniform acceleration in a Gravitational field
(irrespective of their different mass-Matter contents)

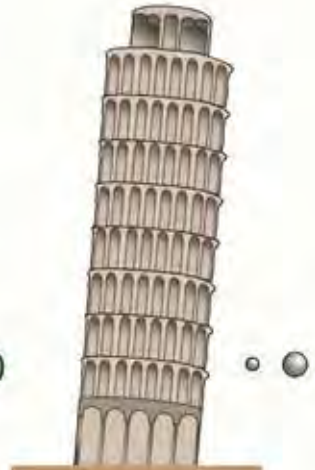


Aristotelian physics

In De motu Galileo proposed that in free fall bodies dropped with a characteristic uniform speed determined not by their weight but by their specific gravity.

He put this theory to the test by dropping bodies from heights and found that his experiments did not confirm his theory.

It is quoted in 'Galileo's Daughter' that the lighter body (i.e. that of the lower specific gravity) will move ahead of the heavier body at the start of the fall, and that the heavier body then overtakes it and arrives at the bottom slightly earlier.



Newtonian physics

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Sir Issac Newton

(25 December 1642 – 20 March 1727)

In the late 17th century, Robert Hooke's suggested
'that there is a gravitational force which depends on the inverse square of the distance'

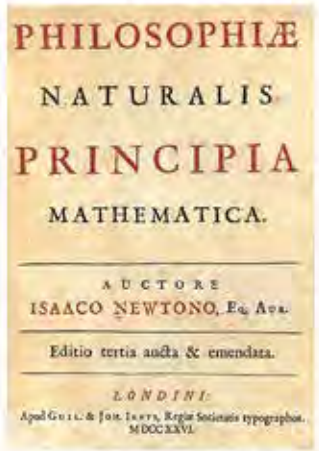
Newtonian Gravitation

Newton's monograph Philosophiæ Naturalis Principia Mathematica, published in 1687, lays the foundations for most of classical mechanics. In this work, Newton described Universal gravitation and the three laws of motion, which dominated the scientific view of the physical universe for the next three centuries.

Newton showed that the motions of objects on Earth and of celestial bodies are governed by the same set of natural laws, by demonstrating the consistency between Kepler's laws of planetary motion and his theory of gravitation, thus removing the last doubts about heliocentrism and advancing the Scientific Revolution.

The Principia is generally considered to be one of the most important scientific books ever written.

Principia Mathematica



first edition (1686/1687)

First Law of Motion

$$\sum \mathbf{F} = 0 \Rightarrow \frac{d\mathbf{v}}{dt} = 0$$

Bodies at rest - remain at rest unless acted upon by an outside Force

Second Law of Motion

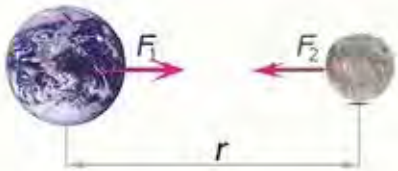
$$\sum \mathbf{F} = \frac{\mathrm{d}\mathbf{p}}{\mathrm{d}t} = m\frac{\mathrm{d}\mathbf{v}}{\mathrm{d}t} + \mathbf{v}\frac{\mathrm{d}m}{\mathrm{d}t}$$

The nett force on a particle is equal to the time rate of change of its linear momentum (p)

Third Law of Motion

$$\sum \mathbf{F}_{a,b} = -\sum \mathbf{F}_{b,a}$$

For every action there is an equal and opposite reaction



Newton's Law of universal Gravitation

"I deduced that the forces which keep the planets in their orbs must [be] reciprocally as the squares of their distances from the centers about which they revolve: and thereby compared the force requisite to keep the Moon in her Orb with the force of gravity at the surface of the Earth; and found them answer pretty neatly"

$$F = -G\frac{M_1 m_2}{r^2}$$

"hitherto I have not been able to discover the cause of those properties of gravity from the phenomena, and I frame no hypothesis"

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According to Bošković's simple dynamistic atomism, Matter is not only endowed with forces (dynamic system), but it is composed of forces (dynamistic system), Forces flow out of the atom and permeate empty space.

This idea led to the concept of the field, much later formulated by M. Faraday (1844), who together with J.C. Maxwell introduced the idea of fields of force into science.

Boskovic is famous for his atomic theory and made many important contributions to astronomy, including the first geometric procedure for determining the equator of a rotating planet from three observations of a surface feature and for computing the orbit of a planet from three observations of its position.

In 1753 he also discovered the absence of atmosphere on the Moon.

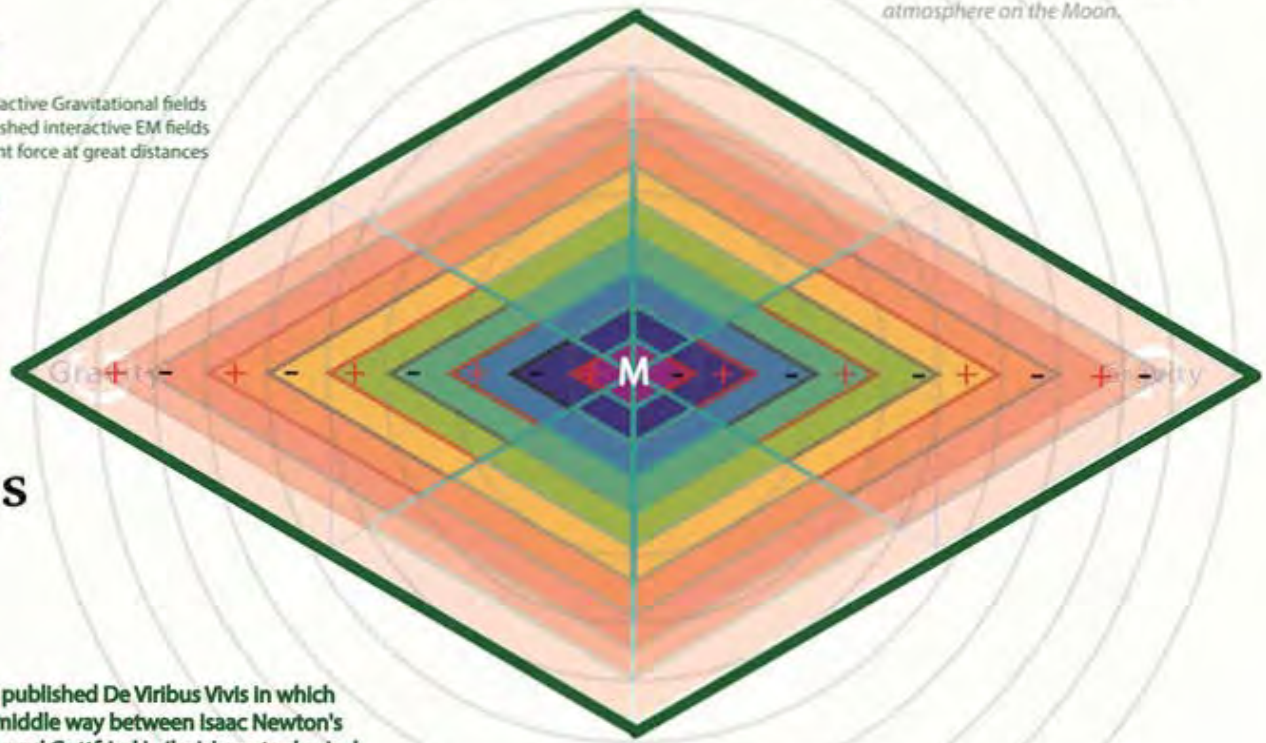
Rudjer Boskovic

(18 May 1711 – 13 February 1787)

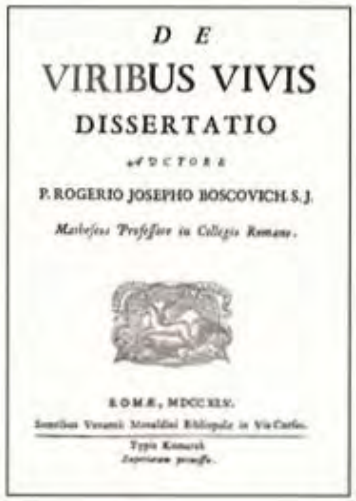
k

Boskovic proposed that attractive Gravitational fields could be explained as diminshed interactive EM fields that result in a nett converent force at great distances

G



Diminished EM waves



D E

VIRIBUS VIVIS

DISSERTATIO

AUCTORE

P. ROGERIO JOSEPHO BOSCOVICH S.J.

Matheseos Professore in Collegio Romano.

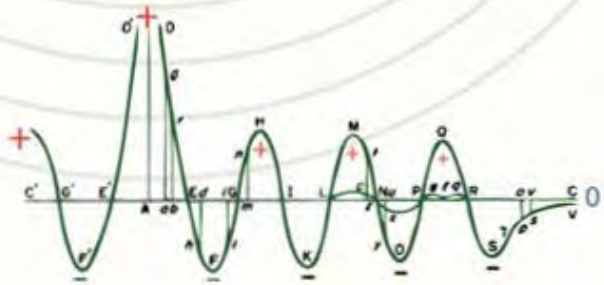
ROMÆ, MDCCXLV.

Superiorum permissu.

In 1745 Bošković published De Viribus Vivis in which he tried to find a middle way between Isaac Newton's gravitational theory and Gottfried Leibniz's metaphysical theory of monad-points

The force is repulsive when this curve lies above the line AC and attractive when it lies below it.

At very large distances (at and beyond V), it is attractive and approaches Newton's inverse-square law of force produced by gravity



nett attractive force at large distances

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Gaussian Gravity

Gauss's law for gravity bears the same mathematical relation to Newton's law that Gauss's law for electricity bears to Coulomb's law.

G

Gauss's law for gravity is mathematically similar in form to Gauss's law for electrostatics.

k

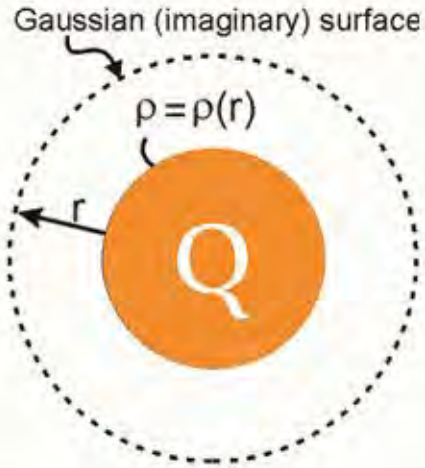
the striking mathematical similarity in the formulation of electrostatics and gravitation has puzzled science for centuries

$$F_{elec} \propto \frac{Q_1 Q_2}{r^2}$$

$$F_{grav} \propto \frac{M_1 m_2}{r^2}$$

Carl Friedrich Gauss

(30 April 1777 – 23 February 1855)



$$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0} = 4\pi kq$$

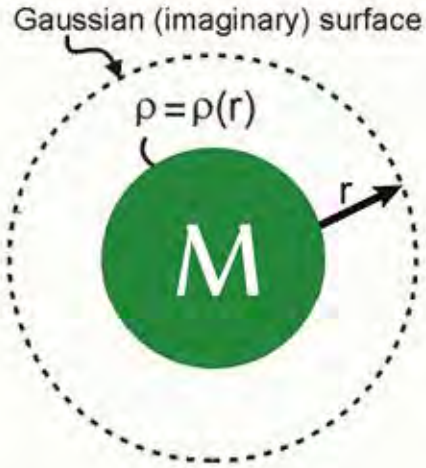
The electric flux through any closed surface is proportional to the enclosed electric charge.

$$\nabla \cdot E = \frac{\rho}{\varepsilon_0} = 4\pi k\rho$$

Gauss's law for gravity, also known as Gauss's flux theorem for gravity, is a law of physics which is essentially equivalent to Newton's law of universal gravitation.

Although Gauss's law for gravity is physically equivalent to Newton's law, there are many situations where Gauss' law for gravity offers a more convenient and simple way to do a calculation than Newton's law.

note: 4π spherical topologies are equivalent to 4π tetrahedral topologies [see Euler characteristics & Gauss-Bonnet topology theorem]



$$\oint_{\partial V} \mathbf{g} \cdot d\mathbf{A} = -4\pi GM$$

The gravitational flux through any closed surface is proportional to the enclosed Matter

$$\nabla \cdot \mathbf{g} = -4\pi G\rho$$

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Poisson's Gravity fields

Charges are the sources and sinks of EM fields

Q

Matter is the source of Gravitational fields

M

Poisson recognised that charges are the sources and sinks of electrostatic fields: positive charges emanate electric field lines, and the field lines terminate at negative charges.

Similarly, in Newton's gravitation masses are the sources of the gravity field so that field lines terminate at objects that have mass.

Poisson formalised Gauss' Law for electric fields (using the more general divergence theorem)

$$\iint \vec{E} \cdot d\vec{S} = \frac{q_e}{\epsilon_0} \Rightarrow \vec{\nabla} \cdot \vec{E} = \frac{\rho_e}{\epsilon_0}$$

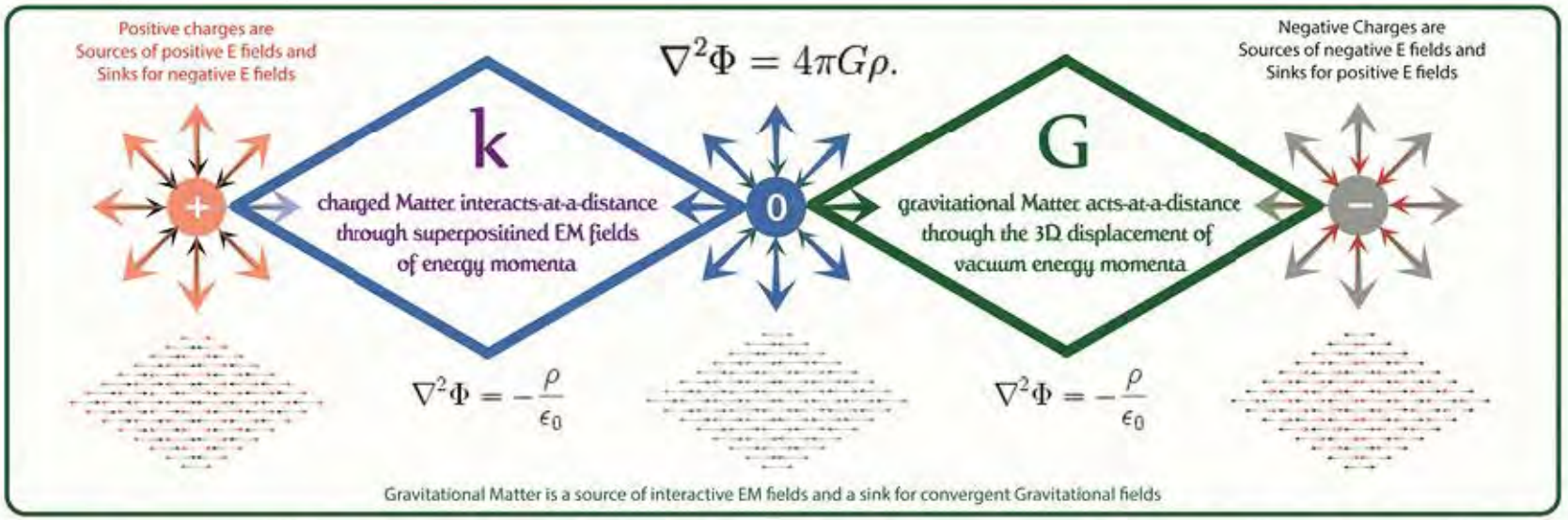
and then applied the same formulation to spherical Matter for gravitation

$$\iint \vec{g} \cdot d\vec{S} = -4\pi G_c m \Rightarrow \vec{\nabla} \cdot \vec{g} = -4\pi G_c \rho_m$$

Simeon Poisson

(21 June 1781 – 25 April 1840)

All EM field interactions are the result of superpositioned EM fields (comprising of convergent AND divergent energy momenta) whose quanta create differing field strengths, The inverse square forces of gravity can be modelled using the same field geometry thus illustrating the reason for the geometric & mathematical similarity between Newton's & Coulomb's constants


Positive charges are Sources of positive E fields and Sinks for negative E fields
$\nabla^2\Phi = 4\pi G\rho.$
Negative Charges are Sources of negative E fields and Sinks for positive E fields
k
charged Matter interacts-at-a-distance through superpositined EM fields of energy momenta
G
gravitational Matter acts-at-a-distance through the 3D displacement of vacuum energy momenta
+
0
−
$\nabla^2\Phi = -\frac{\rho}{\epsilon_0}$
$\nabla^2\Phi = -\frac{\rho}{\epsilon_0}$
Gravitational Matter is a source of interactive EM fields and a sink for convergent Gravitational fields

Tetryonic QM & QED clearly shows that both the sink and source fields are the result of bidirectional energy momenta

Poison's field equations shows that weak KEM field geometries can be used to model the convergent forces of Gravitational fields

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Gravito-Electro-Magnetism

inverse squared law

$$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0}$$

k

$$\oint \vec{B} \cdot d\vec{A} = 0$$

inverse cubed law

Maxwell's 1864 achievements concerning electromagnetism have been called the "second great unification in physics", following on from the first one realised by Isaac Newton.

nett divergent
Electric field forces

$1/r^2$

vector
Magnetic forces

$1/r^3$

Maxwell's equations
$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$
$\nabla \cdot \mathbf{B} = 0$
$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$
$\nabla \times \mathbf{B} = \frac{1}{\epsilon_0 c^2}\mathbf{J} + \frac{1}{c^2}\frac{\partial \mathbf{E}}{\partial t}$

James Clerk Maxwell

(13 June 1831 – 5 November 1879)

Any opinion as to the form in which the energy of gravitation exists in space is of great importance, and whoever can make his opinion probable will have, made an enormous stride in physical speculation.

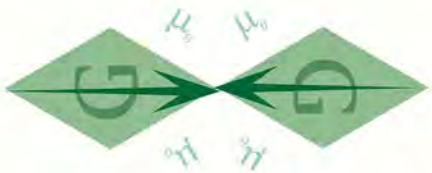
The apparent universality of gravitation, and the equality of its effects on matter of all kinds are most remarkable facts, hitherto without exception; but they are purely experimental facts, liable to be corrected by a single observed exception.

We cannot conceive of Matter with negative inertia or mass; but we see no way of accounting for the proportionality of gravitation to mass by any legitimate method of demonstration

GEM equations
$\nabla \cdot \mathbf{E}_g = -4\pi G \rho_g$
$\nabla \cdot \mathbf{B}_g = 0$
$\nabla \times \mathbf{E}_g = -\frac{\partial \mathbf{B}_g}{\partial t}$
$\nabla \times \mathbf{B}_g = 4\left(-\frac{4\pi G}{c^2}\mathbf{J}_g + \frac{1}{c^2}\frac{\partial \mathbf{E}_g}{\partial t}\right)$

$1/r^2$

strictly convergent vector force



Maxwell proposed a set of equations based on his EM field laws that created a Gravito-Electro-Magnetic field reflective of the similarities between Newton's & Coulomb's Laws

$$\nabla \times \mathbf{E}_g = -\frac{\partial \mathbf{B}_g}{\partial t}$$

G

$$\nabla \cdot \mathbf{B}_g = 0$$

giving rise to spectulation about the existence of 'gravitons'
a theorised Gravitational 'charge' carrier

$1/r^3$

gravitomagnetic dipole

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The General Theory of Relativity

In 1915, Einstein extended SR and proposed a new theory of gravitation to account for accelerating bodies

Einstein said that when he "was sitting in a chair in the patent office at Bern when all of a sudden a thought occurred to me: 'If a person falls freely he will not feel his own weight.' I was startled. This simple thought ... impelled me toward a theory of gravitation. ..."

$$R_{\mu\nu} - \tfrac{1}{2}R g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

The EFE is a tensor equation relating a set of symmetric 4 x 4 tensors.

the scalar curvature — Newton's gravitational constant

Ricci curvature tensor $R_{\mu\nu} - \frac{1}{2}g_{\mu\nu}R + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$ the stress-energy tensor

the metric tensor — speed of light in vacuum

Each tensor has 10 independent components

Spacetime — Matter

$$G_{\mu\nu} + g_{\mu\nu}\Lambda = 8\pi T_{\mu\nu}$$

the cosmological constant

General Relativity describes gravity as a warping of space itself, not as a force.
Einstein pictured space as a three-dimensional version of a thin rubber sheet

Einstein's General Theory of Relativity, which was published in 1916 had as its foundation that the laws of nature in an accelerating frame are equivalent to the laws of a gravitational field.

This is known as the Equivalence Principle.

General Relativity

$$G_{ab} = 8\pi G T_{\mu\nu}$$

Albert Einstein

(14 March 1879 – 18 April 1955)

$$G_{ab} = \kappa T_{\mu\nu}$$

curved spacetime — *mass-energy tensor*

where

$$\kappa = -\frac{8\pi G}{c^4}$$

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GEM fields & Gravity

Gravity is one of the four fundamental interactions of nature,
along with electromagnetism and the nuclear strong and weak forces

[for centuries scientific enquiry has been aimed squarely at discerning a physical mechanism for gravitation]

Sir Issac Newton

(25 December 1642 – 20 March 1727)

Albert Einstein

(14 March 1879 – 18 April 1955)

Matter — Planck quanta

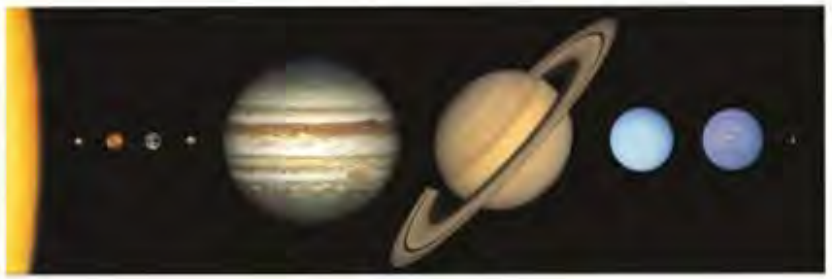
$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

mass — velocity

Tetryonics reveals Gravity to be the result of the displacement of vacuum energies by mass-Matter topologies which is accurately modelled using GEM field geometry

masses

$$F = -G\frac{M_1 m_2}{r^2}$$



energies

$$G_{ab} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

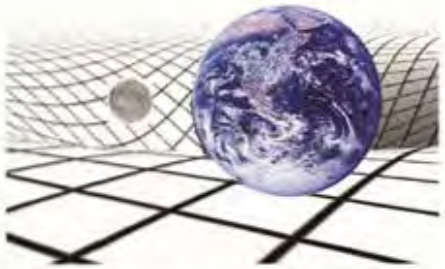
Gravity is responsible for keeping the Earth and the other planets in their orbits around the Sun; for keeping the Moon in its orbit around the Earth; for the formation of tides; for natural convection, by which fluid flow occurs under the influence of a density gradient and gravity; for heating the interiors of forming stars and planets to very high temperatures; and for various other phenomena observed on Earth.

instantaneous action-at-a-distance

Gravity is a natural phenomenon by which physical bodies attract each other with a force proportional to their mass-Matter content.

Gravity is most familiar as the agent that gives weight to objects with mass and causes them to fall to the ground when dropped.

Gravity causes dispersed Matter to coalesce, and coalesced Matter to remain intact. to the creation of the SUN, the Earth, and to source of energy in the stars that light our universe.



motion in curved spacetime

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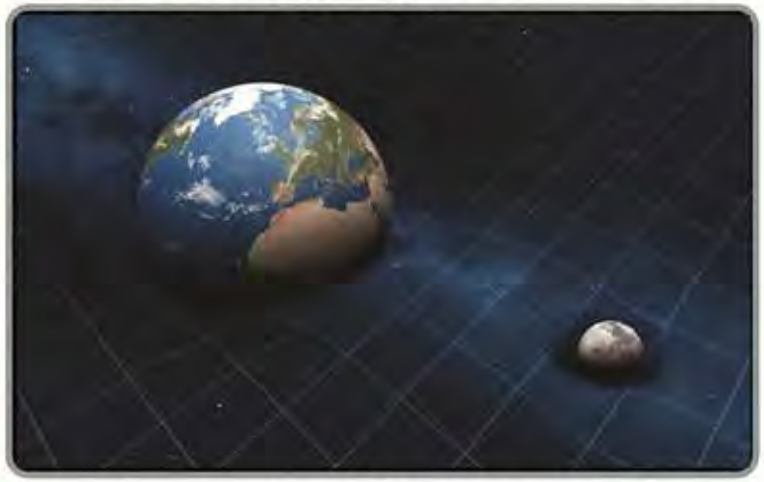
Separating Space & Time



(in the search for Gravity)

Instantaneous 'action-at-a-distance'

DOES

The Earth pull on the moon and
the moon pull proportionally back on the Earth

OR

Does the Earth curve spacetime in its vicinity
with the moon following the geodesic path created

Relativistic spacetime 'curvature'

Tetryonic theory through its clear definitions of charged mass-ENERGY-Matter provides the long-sought answer to Gravitation

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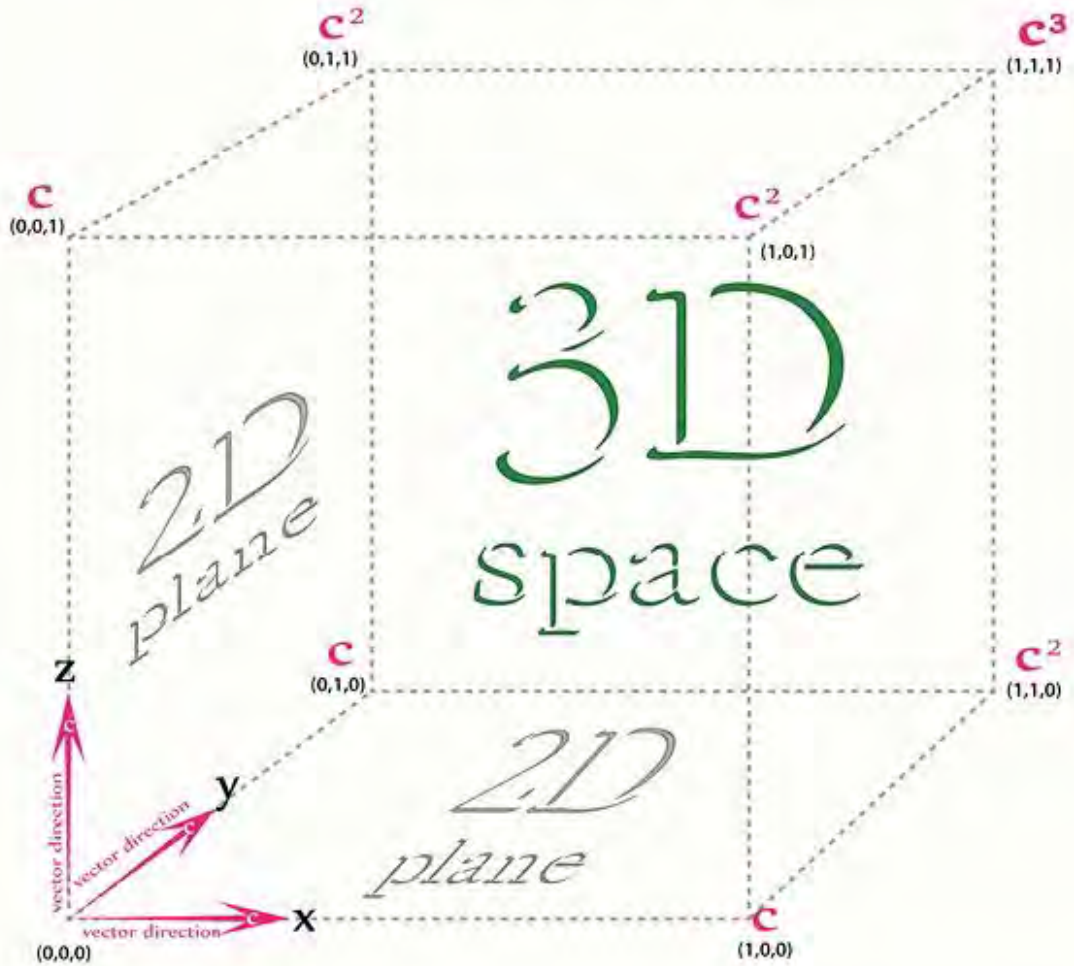
Empty Space

is defined in Tetryonic & relativistic theory
by the speed of light



Energy

content of free space is Zero

A Spatial region is defined
by a co-ordinate system so as to
measure the physics and motion
of mass-ENERGY-Matter
within its confines

mass

is Energy content per unit of time

EM mass-energies can
be found in (and move through)
empty Space in various forms:
radiant energies, Matter etc

Matter

is Energy content per unit of time squared

Space can be any regular geometry
[Cubic, Spherical or polyhedral]
limited by the spatial co-ordinates
used to define the region or volume

Empty Space is defined as a geometric volume devoid of any form of Energy

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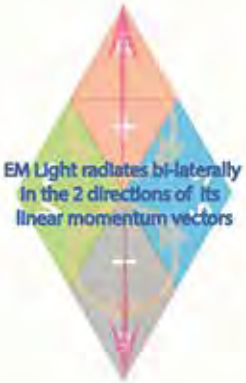
Spacetime co-ordinates

The linear force vectors of divergent Energy
can form various co-ordinate systems
based on their vector directions
per unit of time

Charge radiates unilaterally
in the direction of its
vector linear momentum

Vector forces

Euclidean
planar
space-time



EM Light radiates bi-laterally
in the 2 directions of its
linear momentum vectors

c
299,792,458
linear metres
per sec

c^2
8.987551787 e16
radial square metres
per sec

Time in Physics is a measure
of how long it takes for light to
travel 299,792,458 metres
from its source in a vacuum

metre
299,792,458 sec

A metre in Physics is
the distance light travels in
1/ 299,792,458 of a second
from its source

Radiant Energies

Radial Time

299,792,458 m
second

c^3
2.694400242 e25
cubic metres
per sec

c^4
8.077608713 e33
spherical metres
per sec

Cartesian and Curvilinear
spatial co-ordinate systems
both measure 3D Matter

Energy entropy
of a system

mass-energy-Matter
content of a system

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Spatial co-ordinate geometries

based on the vector speed of light
form distinct spatial co-ordinate systems
for the measurement of physics

vector lines

1 Dimensional velocity

metres

Planar Circles

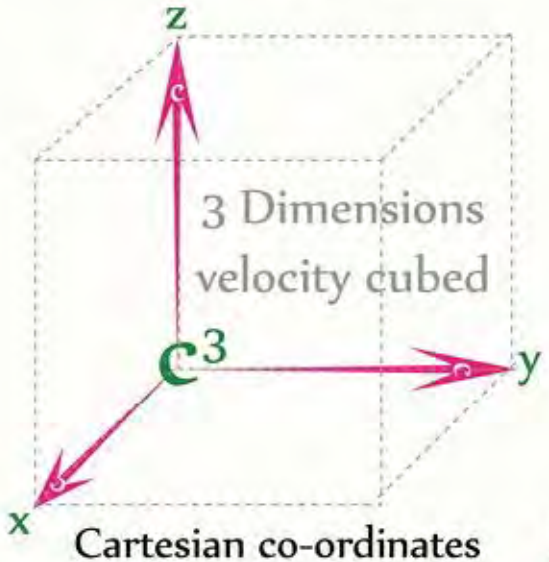
2 Dimensions

c^2

velocity squared

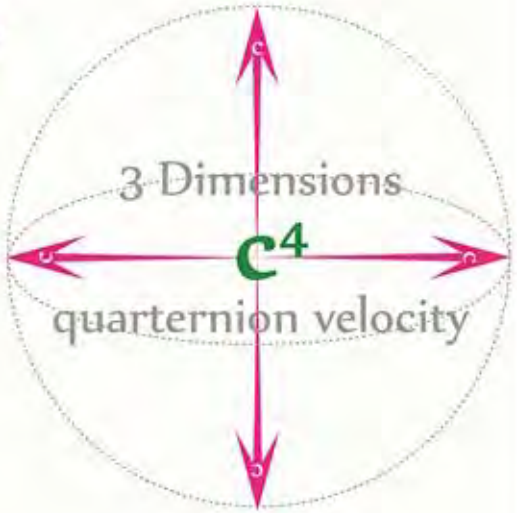
seconds

Cubic volumes



Cartesian co-ordinates

Spherical volumes



seconds²

Forces

mass-energies

EM energy has an equilateral geometry
and forms Tetrahedral topologies
within regions of empty space

mass-Energy-Matter
and all forces

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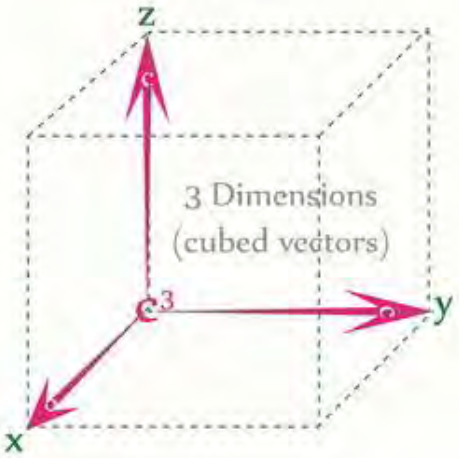
Spatial co-ordinate systems

Cubic



Spacetime (or space-time, or space time) is any mathematical model that combines space and time into a single continuum.

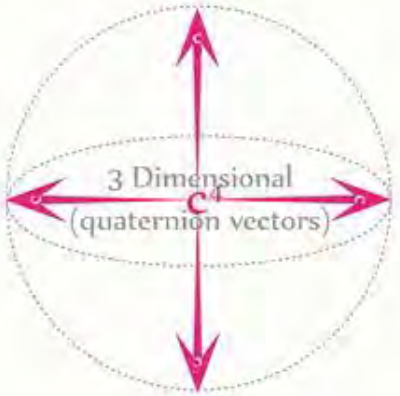
Spacetime is usually interpreted with space as being three-dimensional and time playing the role of a fourth dimension that is different from the spatial dimensions.

Tetryonic theory redefines as time to be a measure of the changing quantised angular momenta of Planck scale Charges In any spatial plane or volume

By combining space and time into a single manifold, we can significantly simply a large number of physical theories, and re-formulate them in a more uniform way to explain the mechanics of the Universe at all scales

Tetryonics maps radial spacetime co-ordinates through the vector momentum of Energy

Spherical



seconds²

Cartesian Space-Time

3 spatial vectors

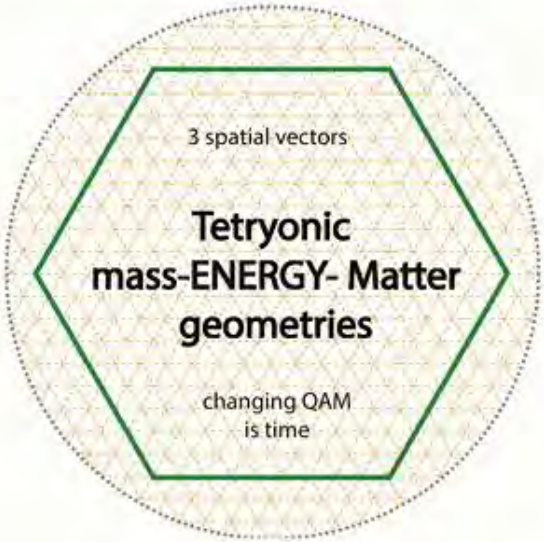
Recti-Linear energy momenta mapping

1 hidden dimension of time

The quantised angular momenta of mass-Energy and Matter are triangular geometries

The current methodologies for mapping energy densities onto Euclidean, Cartesian and Reimannian co-ordinates are inaccurate reflections of the charged mass-ENERGY-Matter geometries, introducing a mathematical complexity to a otherwise simple foundational equilateral geometry

Tetryonic Space-Time



By mapping equilateral mass-energies & Matter into radial spatial co-ordinates Tetryonic theory is able to reveal the hidden 4th dimension of time

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Space & time separated

All equilateral mass-energies & tetrahedral Matter can be mapped with planar spatial geometries within spherical space-time co-ordinates

Space is the region of measurement defined by the vector propagation of light
time is a measure of the changing QAM within any spatial region

Tπ standing-waves

c^4 spatial regions contain mass-Matter

spatial field

nullspace

compounds

c^2 spatial regions contain mass-energies

nπ radiant geometries

weak irradiated mass-energies permeate 'empty' space
[vacuum energies]

γ

photons

Baryons

Elements

3D Matter

topologies

Molecules

W+

2D mass-energy

geometries

+q

bosons

charges

-q

W-

photons

γ

'nullspace' is a spatial region devoid of all forms of energy
[found only within tetrahedral Matter topologies]

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2D Euclidean spatial geometry

All 2D mass-energy momenta map onto **FLAT** Euclidian co-ordinates

[x,y] $\Delta\Omega$

(2D space & time)

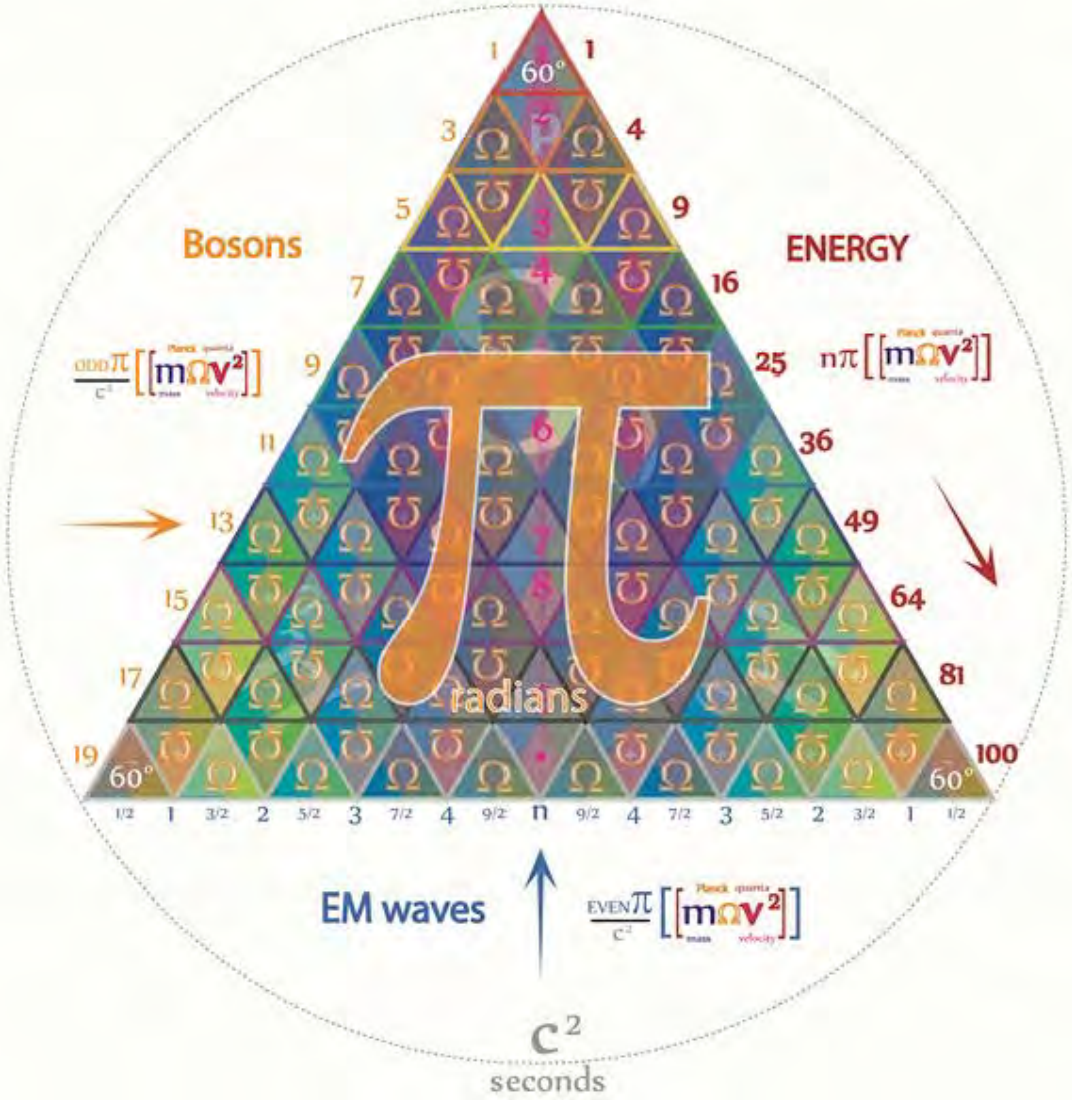
Cartesian spatial co-ordinates

fail to accurately map
equilateral energy momenta

Minkowski spacetime

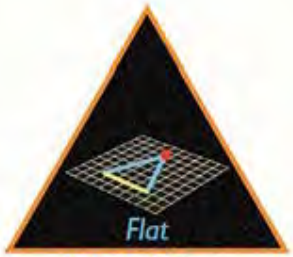
is a close approximation of
Tetryonic energy momenta

Tetryonic space-time



negative curvative

angles add up to > 180 °



flat Euclidean

angles = 180 °

positive curvature

angles add up to < 180 °

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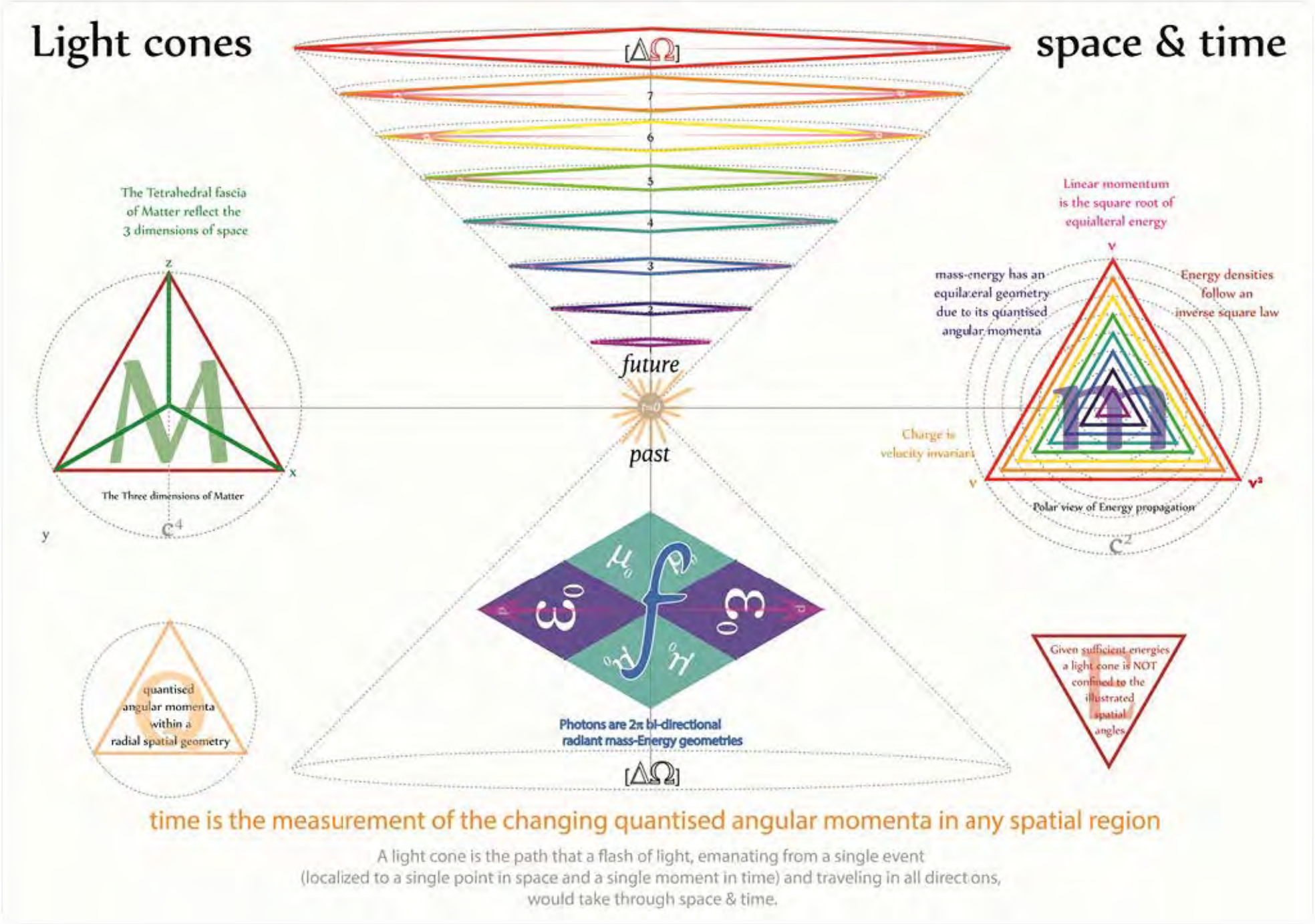

time is the measurement of the changing quantised angular momenta in any spatial region

A light cone is the path that a flash of light, emanating from a single event
(localized to a single point in space and a single moment in time) and traveling in all directions,
would take through space & time.

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Charge, energy momenta & time

measurements of the changing quantised angular momenta of scalar energy is the basis of measuring time

Ω

.0012

$\frac{m^2}{s}$

quantised angular momentum

$\beta = \left[\frac{v}{c}\right]$

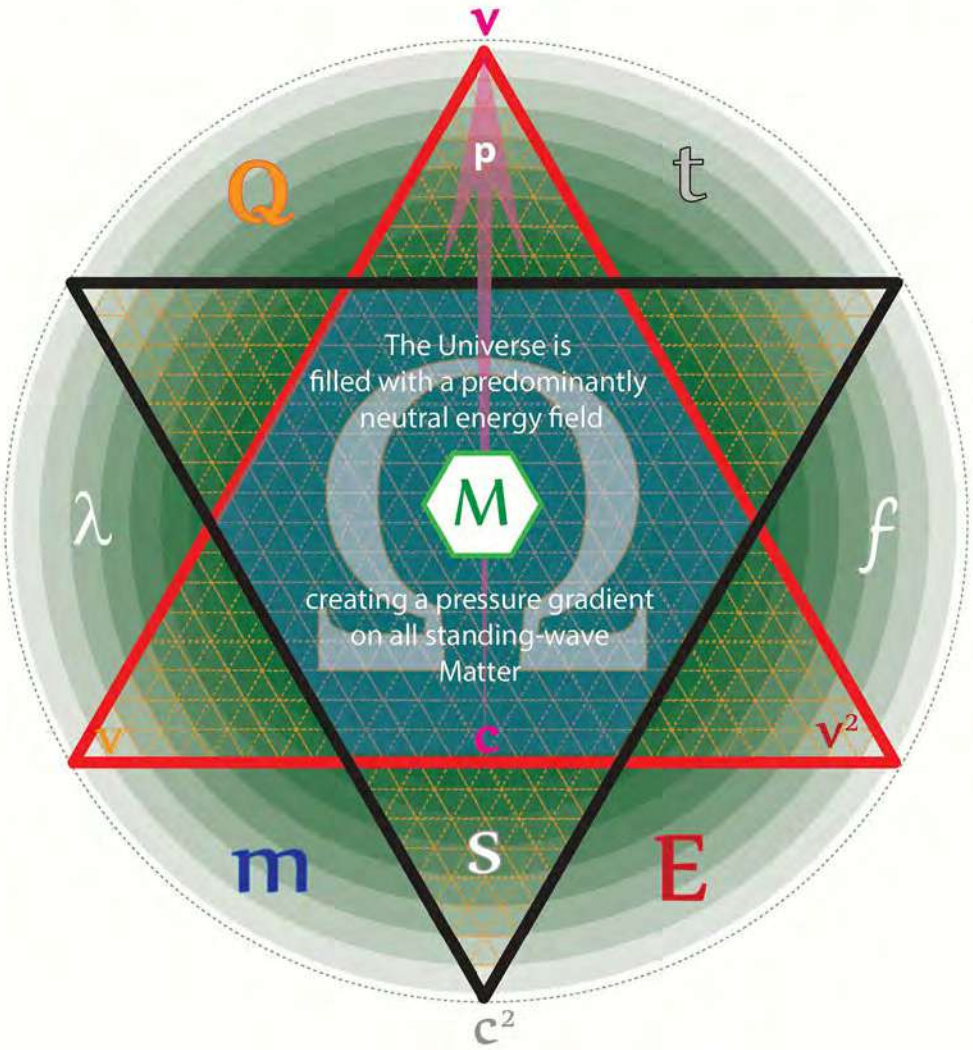
Linear Lorentz factor

metres

$\frac{m^2}{s} \cdot \frac{s}{m}$

$\frac{\Omega}{v}$

λ



Velocity of Light

$c = \left[\left[\frac{\Omega}{c}\right]^{\lambda} \cdot \left[\frac{c^2}{\Omega}\right]^{f}\right]$

Wavelength Frequency

q

$\frac{\Omega}{c^2}$

$\frac{m^2}{s} \cdot \frac{s^2}{m^2}$

seconds

$\left[\frac{v^2}{c^2}\right] = \beta^2$

Scalar Lorentz factor

per second

$\frac{m^2}{s^2} \cdot \frac{s}{m^2}$

$\frac{v^2}{\Omega}$

f

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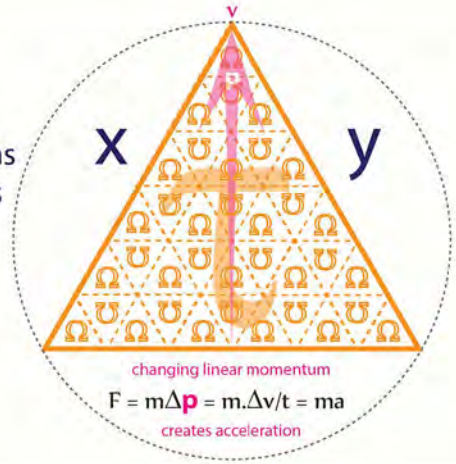
$\vec{p}$

Spatial co-ordinate systems are defined by the vectors of their linear energy momentum

Space
[x,y,z]



$\Delta\Omega$

Time is a measure of the changing quantised angular momenta in any defined region of space

Time
[seconds]

Spacetime Fields

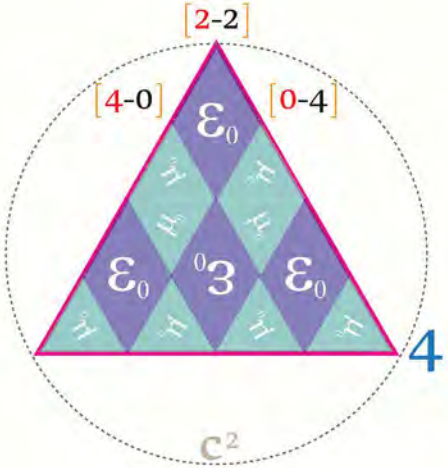
are spatial geometries that contain changing Quantised Angular energy-Momenta [Planck quanta]

Charge is the nett distribution of Planck quanta mass.[Quantised Angular Momenta] within any spatial co-ordintate system

EM masses are 2D planar energy waveforms

2D mass-energy quanta have linear & angular momenta

Matter has a 3D volumetric energy waveform



mass Planck quanta

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

mass velocity

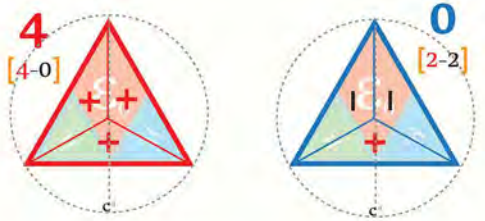
Tetryonic geometry restores symmetry to Einstein's mass-energy equivalence and reveals a mass-ENERGY-Matter equivalance

radiant mass-energies can form standing-wave Matter

$$\frac{m}{c^2} = \frac{E}{c^4} = M$$

standing-wave Matter can release radiant mass-energies

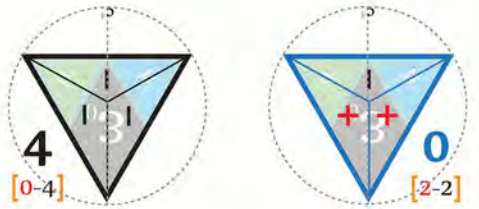
where space and time are separated



Matter Planck quanta

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

mass velocity



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The 4th dimension of Time

is charge, the angular momenta associated with any planar mass-energy

Accelerate

$\vec{p}$

increasing a systems's linear momentum

$F = m\Delta p = m.\Delta v/t = ma$

creates acceleration

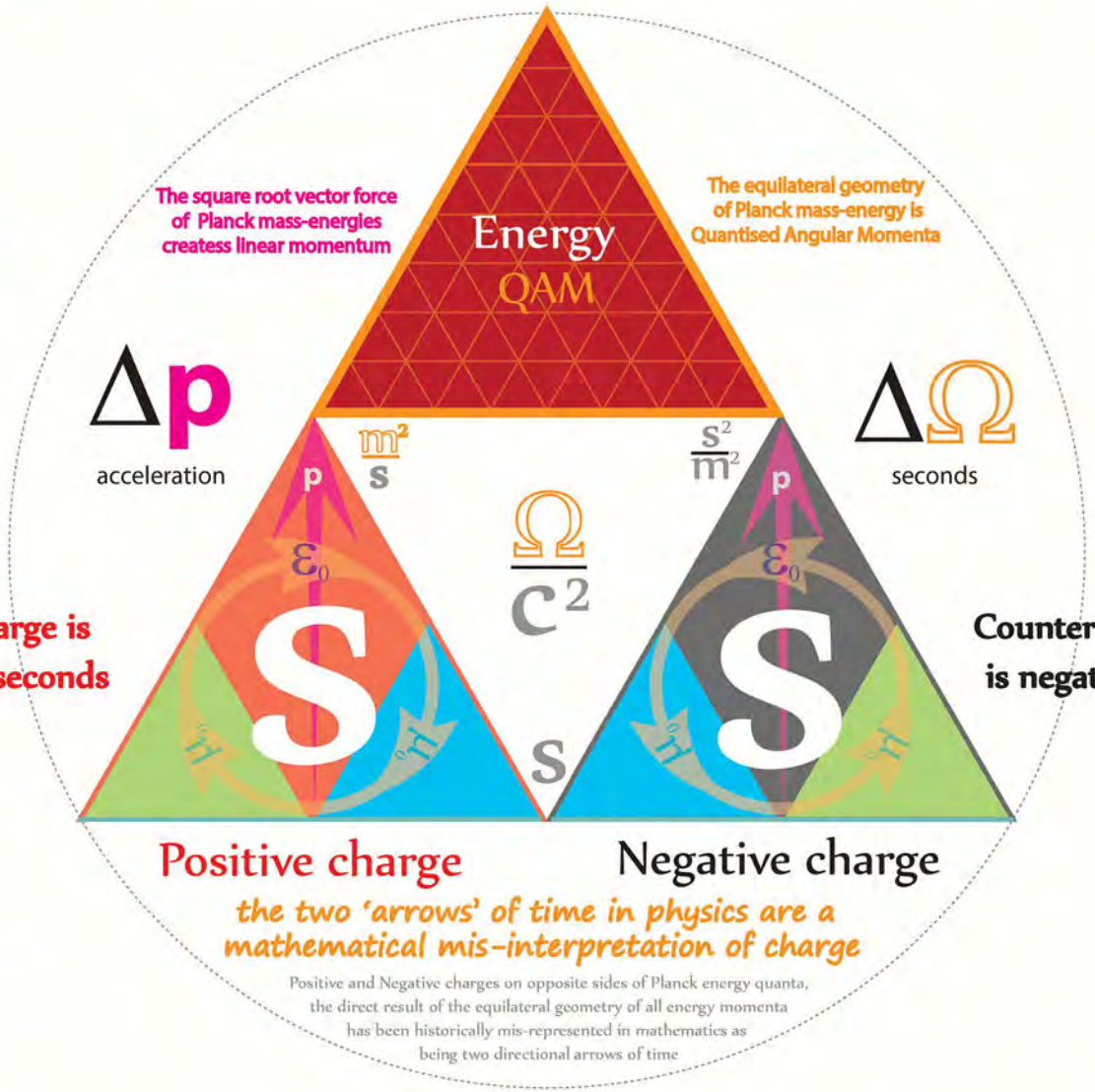
Deccelerate

$\vec{p}$

decreasing a systems's linear momentum

$F = m\Delta p = m.\Delta v/t = ma$

creates deccelerate


The square root vector force of Planck mass-energies createss linear momentum
Energy
QAM
The equilateral geometry of Planck mass-energy is Quantised Angular Momenta
Δp
acceleration
m²/s
s²/m²
ΔΩ
seconds
p
p
ε0
ε0
Ω/c²
S
S
S
Clockwise charge is positive mass-seconds
Counter-clockwise charge is negative mass-seconds
Positive charge
Negative charge
the two 'arrows' of time in physics are a mathematical mis-interpretation of charge
Positive and Negative charges on opposite sides of Planck energy quanta, the direct result of the equilateral geometry of all energy momenta has been historically mis-represented in mathematics as being two directional arrows of time

$\Delta\Omega$

Positive Time

Time is a measure of the changing angular momenta-energy (Planck geometry) of any given spatial region

$\Delta\Omega$

Negative Time

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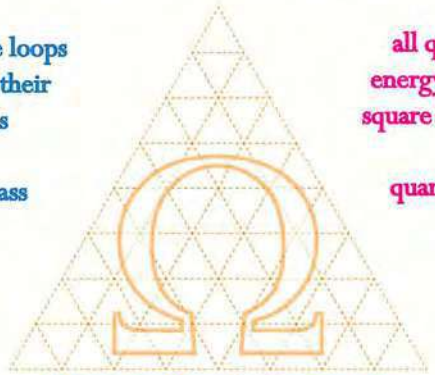
CHARGE

all ideal inductive loops resist changes to their Energy levels

INERTIAL mass



All quantised angular momentum is an equilateral geometry

all quantised Planck energy momenta posses square root vector Forces

quantum of WORK

vector velocity results from linear momentum - the square root of all scalar energies

$$kg\left[\frac{m^2}{s^2}\ \frac{s^2}{m^2}\right]$$

$$kg\left[\frac{m^2}{s}\ \frac{s^2}{m^2}\right]$$

Scalar energy per unit time

mass

Planck quanta per unit time

mass.seconds

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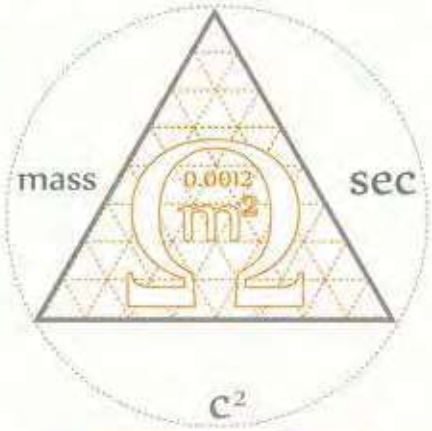
Positive charged mass-energy

1
[1-0]

Clockwise inductive energy flux

Charge is the equilateral geometry of Energy that gives form to all mass & Matter



mass.seconds in physics is expressed as Coulombs [charge]

$$t \quad \frac{\Delta\Omega}{c^2} \quad \frac{m^2}{s}\frac{s^2}{m^2} \quad s \quad t$$

seconds

1.33518 e-20 s

Changes to nett quantised angular momenta [charged mass-energies] within any spatial co-ordinate system forms the basis of time

Negative charged mass-energy

1
[0-1]

Counter clockwise energy flux

ElectroMagnetic Charge is a quantum property resulting from the equilateral QAM geometry of mass-energy

Two ElectroMagnetic charges are possible & both are created through the tesselation of EM energy momenta in ideal inductive loops

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The Quantum Arrow of Time

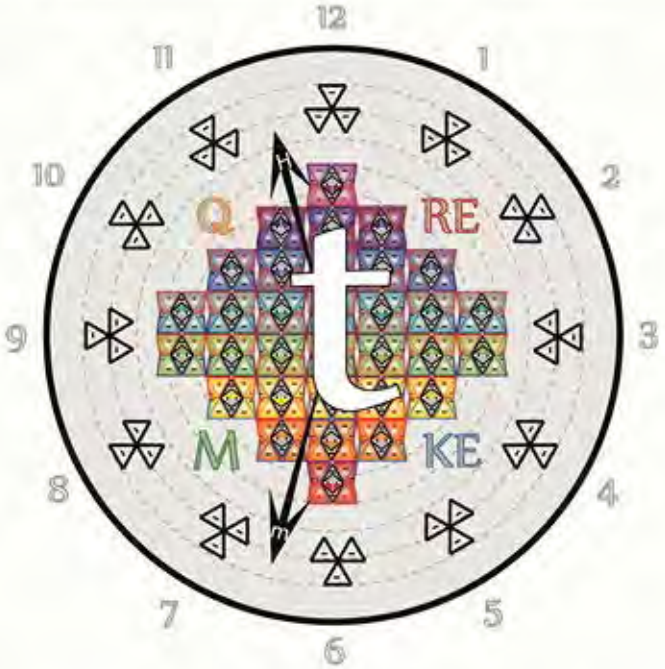
in physics is a measurement of changes to quantised angular momenta

Thermodynamic arrow of time

The Entropy of a system always increases

Radiative arrow of time

EM mass-energies native outward from a point source



Cosmological arrow of time

The Universe is evolving from a big bang to ?

Causal arrow of time

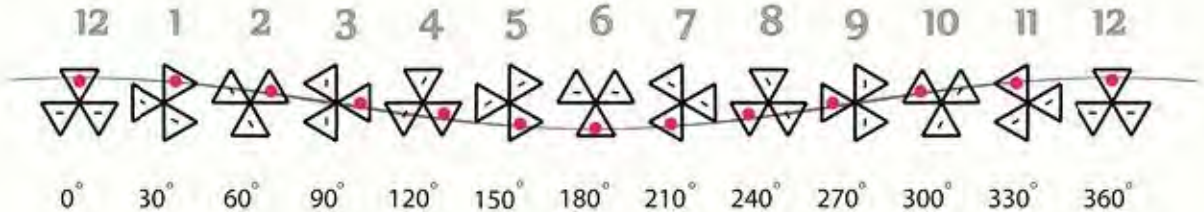
A cause always precedes its effect

Tetryonic theory maps QAM as equilateral Planck geometries & reveals ΔQAM to be time
Time and the spatial dimensions it creates are mapped with radial & spherical co-ordinates

ΔmΩ
Decceleration

The Arrow of Time

is our perception of changing quantum-scale angular momenta



ΔmΩ
Acceleration

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Time dilation

An accurate clock at rest with respect to one observer may be measured to tick at a different rate when compared to a second observer's own equally accurate clocks.
This effect arises neither from technical aspects of the clocks nor from the fact that signals need time to propagate, but from the nature of spacetime itself.

The changing quantised angular momenta of all mass-energy-Matter densities in any spatial region all impact on our measurement of time [$\Delta\Omega$]

increasing the mass of Matter increases the stress energy tensor [mass-energy gradient]

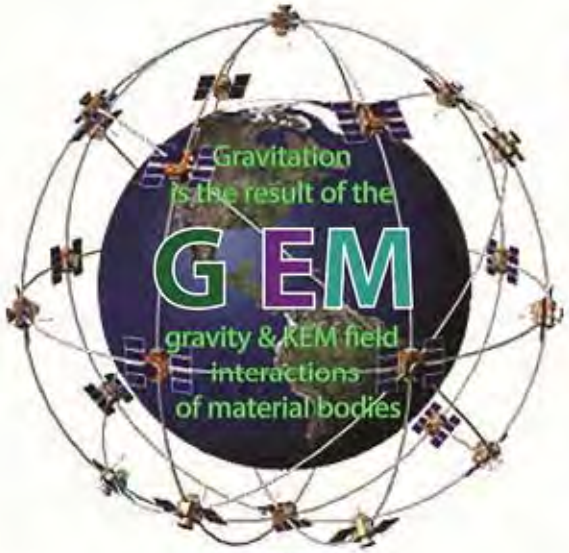
Stronger G fields

GR

Vacuum energy-Matter pressure gradients

Weaker G fields

gravity is proportional to the material displacement volume of mass-Matter in a given spatial region of vacuum energy



tests of GR using photons are erroneous tests of SR

accelerating material objects increases the Planck quanta [mass.QAM] in their KEM fields

Stronger KEM fields

Kinetic EM energies of motion

SR

Weaker KEM fields

deccelerating material objects decreases the Planck quanta [mass.QAM] in their KEM fields

Any attempt to accurately model the full effections of Gravitation must include a complete definition and differentiation of all mass-energy & Matter along with the vacuum energy pressure gradient created by them

In the theory of relativity, time dilation is an actual difference of elapsed time between two events as measured by observers either moving relative to each other or differently situated from gravitational masses.

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Entropy in physical systems

is the result of changes to the net organisation of quantised angular momenta as it seeks equilibrium

Second law of thermodynamics

An isolated physical system, if not already in its own internal state of thermodynamic equilibrium, spontaneously evolves towards it.
In an isolated physical system, there is a tendency towards spatial homogeneity.

The Boltzmann equation was developed to describe the dynamics of an ideal gas

$$\frac{\partial f}{\partial t} + v\frac{\partial f}{\partial x} + \frac{F}{m}\frac{\partial f}{\partial v} = \frac{\partial f}{\partial t}$$

Ludwig Eduard Boltzmann

(February 20, 1844 – September 5, 1906)

$$S = k\cdot[\log(W)]$$

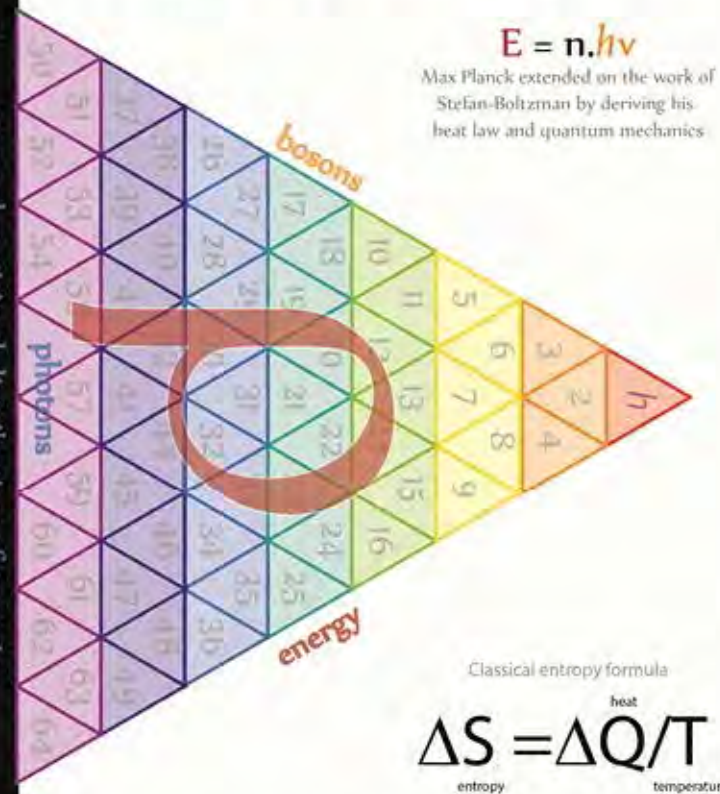
Boltzmann entropy formula

Tetryonic theory utilises the equilateral geometry of ideal quantum inductors to model EM energies

mass-energy radiator

normal statistical distribution of energies

Energy in all its forms seeks equilibrium



$$E = n.h\nu$$

Max Planck extended on the work of Stefan-Boltzman by deriving his heat law and quantum mechanics

Classical entropy formula

$$\Delta S = \Delta Q/T$$

entropy — heat — temperature

Energy always moves from higher energy organised systems to a lower dis-organised system

lower energy blackbody

A black body is an idealized physical body that absorbs all incident electromagnetic radiation

Jacob David Bekenstein

(born May 1, 1947)

Bekenstein-Hawking entropy formula

$$S = \frac{\pi A k c^3}{2hG}$$

still uses 3D [c^3] classical cartesian co-ordinates

Stephen William Hawking

(born 8 January 1942)

Tetryonic theory unites classical and quantum mechanics with relativity through equilateral QAM

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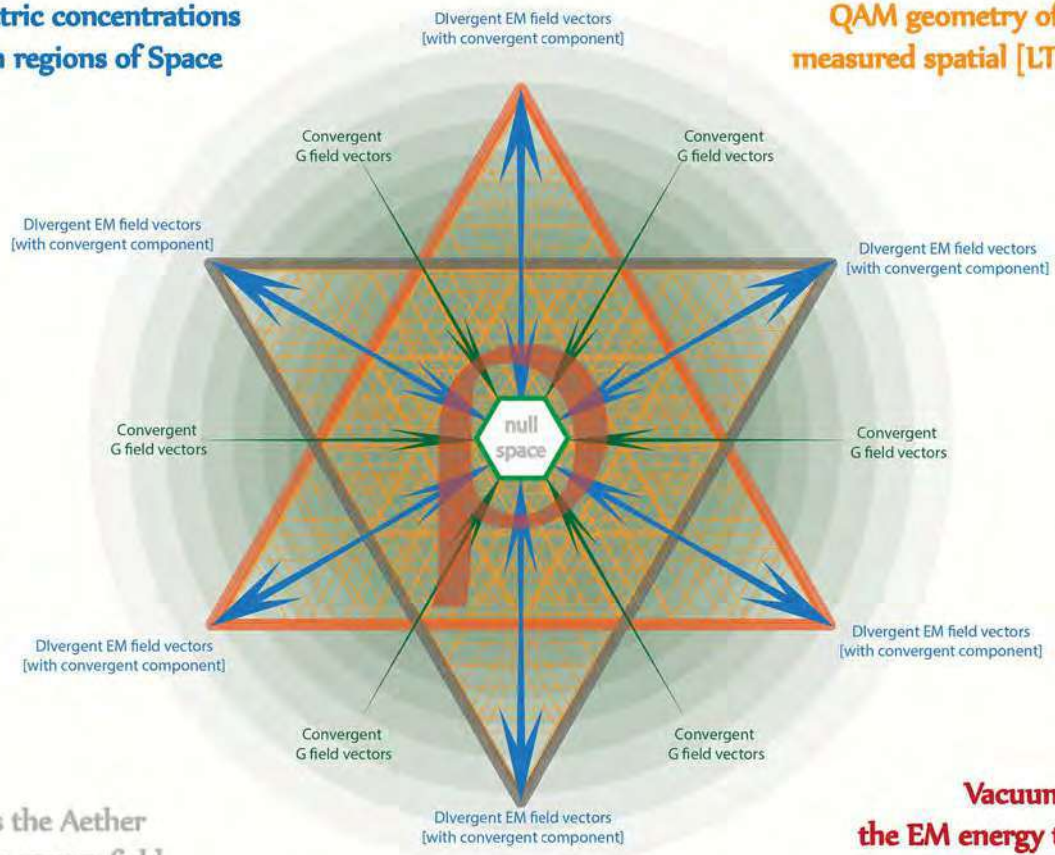
The Aether

Aether theories in physics propose the existence of a medium, the aether
a space-filling substance or field, thought to be necessary as a transmission
medium for the propagation of electromagnetic waves.

bosons, photons and Matter
are simply geometric concentrations
of EM energy in regions of Space

Spacetime is the
QAM geometry of any
measured spatial [LT] region



Vast radiant energy fields
exist throughout all of Space
save inside Matter topologies

Matter geometries form
perfect quantum Faraday cages
excluding all energies
thus creating nullspaces

The low level EM fields
permeating the space between
Matter forms a background
vacuum energy density

The vacuum energy field
acts upon the internal 'null space'
volumes of all Matter creating a
gravitational pressure gradient

Historically refered to as the Aether
(or the Ether) this vacuum energy field
has been the source of much contention

Vacuum Energy is
the EM energy that permeates and
fills any spatial region

Photons do not require the aether to propagate however
the aether is permeated with 'weak' superpositioned EM fields

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The Luminiferous Aether

In the late 19th century, luminiferous aether or ether, meaning light-bearing aether, was proposed as a medium for the propagation of light.

Newton's Opticks (1704) postulated an "Aethereal Medium" transmitting vibrations faster than light, by which light, is put into "Fits of easy Reflexion and easy Transmission"

Maxwell proposed a mechanical sea of molecular vortices to explain the transfer of ElectroMagnetic energies

Einstein wrote that one can actually speak about a "new aether", but one may not speak of motion in relation to that aether

$\frac{\rho}{m^2}$

Photons are radiant 2D mass-energy geometries

Vacuum energies are very long wavelength photons

Hendrik Lorentz created an electron/aether theory, in which he introduced a strict separation between Matter and the aether

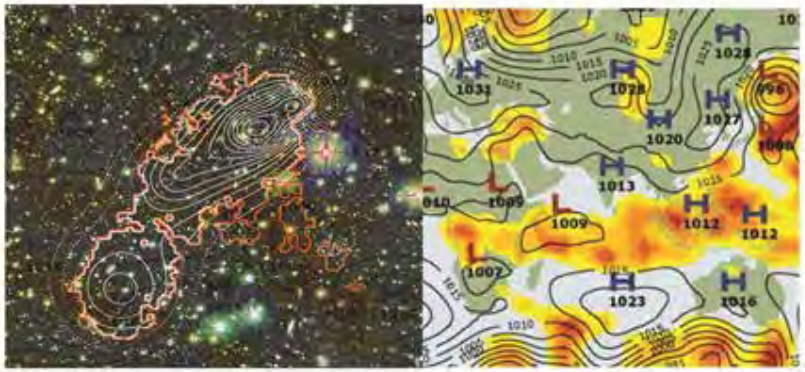
$\frac{\rho}{m^3}$

All Matter are 3D mass-energy topologies containing nullspaces

Planets, Stars and Galaxies contain high densities of mass-energies

Michaelson and Morley sought to detect the Relative motion between the Earth and aether by measuring the speed of light

In Tetryonics all EM radiation & Matter are revealed to be concentrations of geometric Energies seeking equilibrium in regions of Spacetime



The aether does NOT facilitate the transmission of Energies throughout the Universe, it is the result of radiated [K]EM energies

Vacuum energies can be likened to the mean atmospheric pressure, with 2D mass-energies being HIGHER pressure 'gusts'

and

the nullspaces within 3D Matter creating a LOW pressure gradient [providing a driving mechanism akin to to that of Storms, Cyclones or Tornados]

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Vacuum Energy

Vacuum energy is an underlying background mass-energy that exists in free space even when the space is devoid of matter

The Universe is Electric in nature and all Matter in it interacts via Gravito-Electro-magnetic [GEM] fields

Tetryonics shows that all Matter is quantised and these charged mass-energy quanta produce EM fields of varying strengths in turn radiating out from the source Matter into Space to form GEM fields

VE is not a 'quantum foam' as popularly depicted, it is a triangular Euclidean geometry of neutral mass-energies

The internal nullspaces of all Matter geometries creates a pressure gradient within Vacuum energies

Photons

'Vacuum' Energies

EM fields do NOT propagate to 'infinity'

They radiate under the inverse square law until they weaken to become vacuum-energies

Gravitational Energy

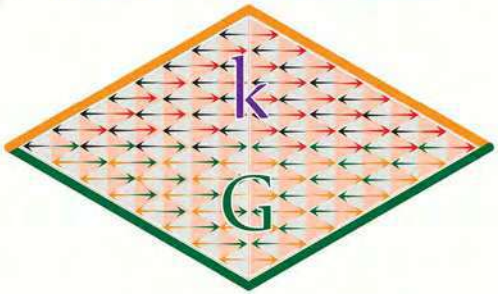
Matter

There are no 'virtual particles' in free space only varying mass-Energy density geometries [Bosons, Photons & Matter]

The Cosmic background radiation is the result of low level KEM fields radiated from all Matter

The field gradients are strongest closer to bodies of Matter

Coulombic fields are DIVERGENT [K]EM fields with interactive forces



Gravitational fields are CONVERGENT Gravity is always attractive

Space is not Black [it is INDIGO]

It is filled with superpositioned EM fields

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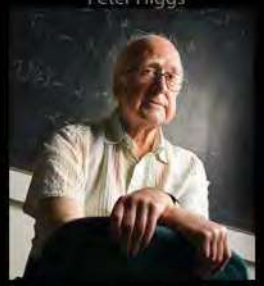
The Higgs Field

is another name for the Aether (or vacuum energy field) that fills free Space, its interaction with inductive Tetryonic topologies creates the inertial properties observed in mass-Matter

Peter Higgs



(born 29 May 1929)

The 'Higgs Boson' is just a W boson by another name

All Higgs vacuum fields are equilateral mass-Energy-momenta fields

Free Space

is any spatial region free of EM energy quanta (nullspace within Tetryons)

Vacuum Energy

is the lowest denisty [longest wavelength] electromagnetic mass-energy that having diverged from Matter radiates outwards to fill space & create a pressure gradient

'Virtual particles' do NOT exist

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All Bosons have ODDn planar electromagnetic charge geometries

Inductive resistance to changes of the energy content of charged fascia through vacuum energy fields creates inertial mass

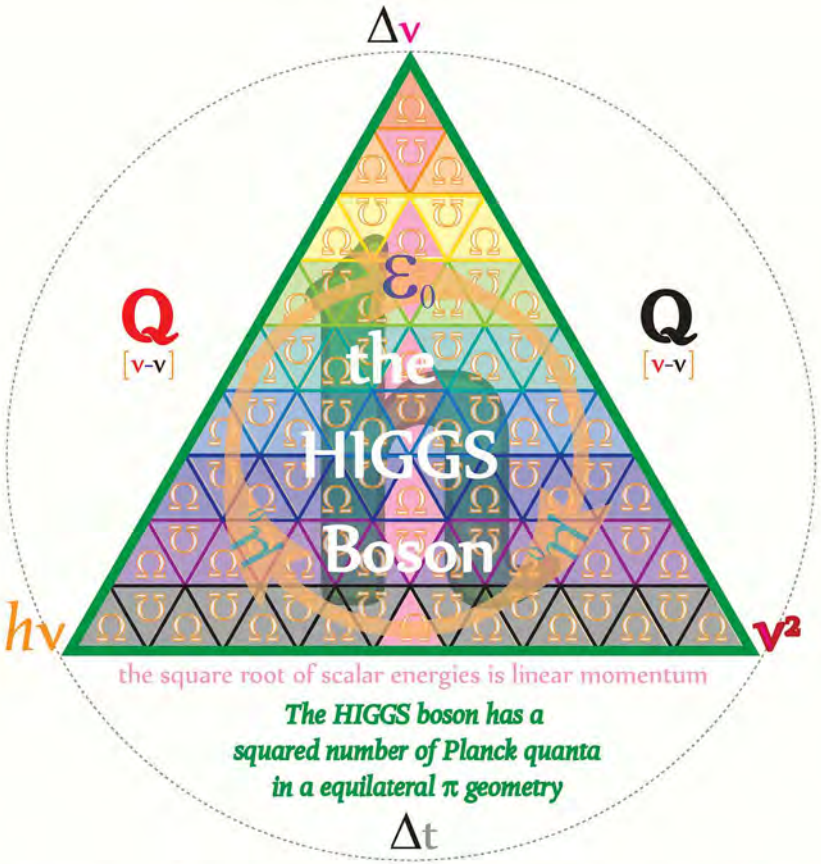
$$\frac{n\pi}{c^2}[[m\Omega v^2]]$$

mass · Planck quanta · mass · velocity

Electromagnetic mass is a measure of the Energy content of a 2D geometry per unit of Time

$$m$$

mass-energy is a 2D geometric property of 3D Matter



the square root of scalar energies is linear momentum

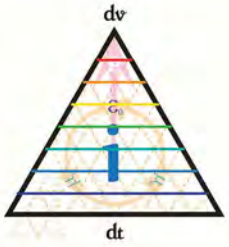
The HIGGS boson has a squared number of Planck quanta in a equilateral π geometry

The HIGGS boson is an alternative name for the 2D charged mass-energy fascia of all Matter

[whose inductive QAM quanta create the physical property of inertial mass]

$$F = \dot{m}a$$

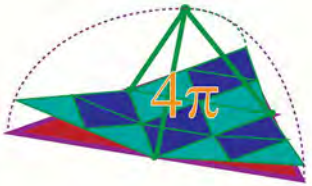
inertial mass is a measure of a body's resistance to changes in acceleration due to external forces



Charged Planck quanta form the geometry of of all mass-ENERGY-Matter [each charge fascia contains equilateral mass-energy momenta]

TETRYONS

All Matter has 4n enclosed tetrahedral charge topologies



$$\frac{T\pi}{c^4}[[m\Omega v^2]]$$

Matter · Planck quanta · mass · velocity

3D material Matter is a EM standing-wave topology whose mass is a measure of its geometric Energy content

$$M$$

Matter is the 3D topology created by mass-energies

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The energy momenta density of standing wave Matter

determines its inertial mass

m
mass
kg

M
Matter
KG

Spatial topology

$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Matter; Planck quanta; mass; velocity

EM mass-energies

de Broglie Wavelengths

$\frac{\rho}{c^2}$
mass
m

$\frac{\rho}{c^4}$
Matter
M

Compton Frequencies

The mass-energy content of Matter is contained entirely within its charged fascia topology

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3D Nullspaces

Planck mass-energy quanta clothe
only the topologies of Matter

**3D EM fields with volume
are measurements of
Energy per unit Time squared
[Matter]**

$T\pi$

**Nullspace is proportional to the
internal volumes of Tetryons**

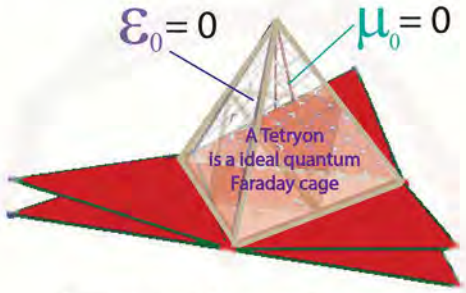
**2D planar EM fields
are measurements of
Energy per unit Time
[EM mass]**

$[m\Omega v^2]$

**The mass-energy densities [fascia] of
Matter do NOT influence nullspaces**

**Inside the Tetrahedral topologies
of all Matter exists the only true vacuum**

Any radiant energy trying to enter the interior volume of a Tetryon will be absorbed into the fascia, increasing its Tetryonic mass (or increasing its KEM field energy)



A volume devoid of any possible energy quanta
[ie The True vacuum]

The interior volume of Tetryons has the lowest energy density/pressure possible and is accumulative as Matter forms increasingly complex states, creating regions of low energy density within the nuclei of all Matter

Outer space is considered a high-quality vacuum, with the equivalent of just a few hydrogen atoms per cubic meter on average. However even it is permeated with superpositioned EM fields of vacuum mass-energies

$\frac{\rho_0}{T}$

A true vacuum is a spatial volume that is completely devoid of EM mass-energies, such that its energy density/pressure is much lower than of the surrounding energy density/pressure [a nullspace]

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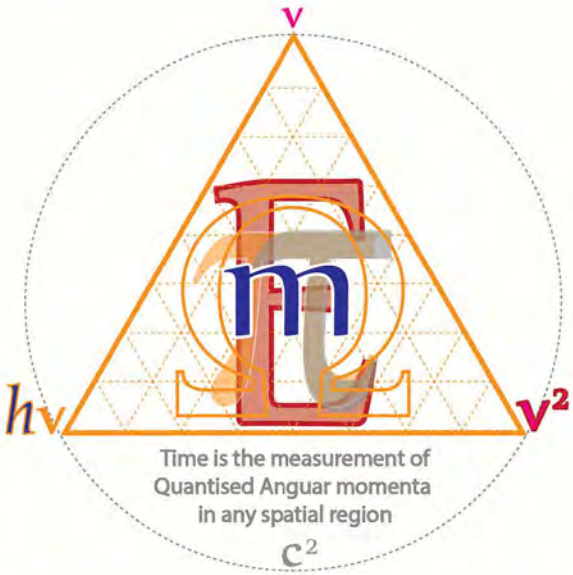
[x,y] $\Delta\Omega$

Positive charges in 2D space
are classically modelled as
clockwise energy fluxs



[x,y] $\Delta\Omega$

Negative charges in 2D space
are classically modelled as
anti-clockwise energy fluxs

Charged Planck mass-energies provide the scaffolding of 3D Matter

$$\frac{\text{mass}}{n\pi}\left[\left[m\Omega v^2\right]\right]_{\text{mass velocity}}^{\text{Planck quanta}}$$

$$m_{\text{mass}}$$

[x,y,z] $\Delta\Omega$

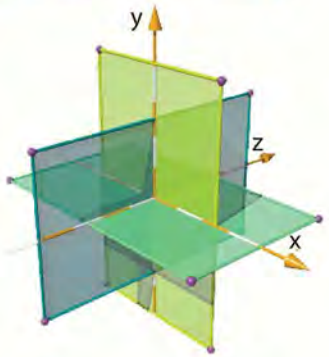
3D Space and Time

$$M_{\text{Matter}}$$

$$\frac{\text{Matter}}{T\pi}\left[\left[m\Omega v^2\right]\right]_{\text{mass velocity}}^{\text{Planck quanta}}$$

2D mass geometries are a property of 3D Matter

2 Dimensional mass-energies



3 Dimensions of Space

kg

radiant

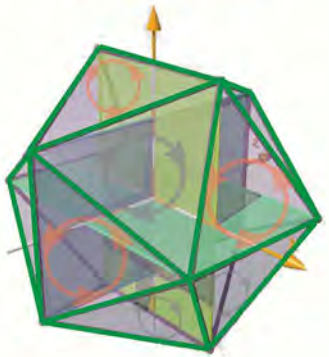
2D mass-energy momenta

$$T\pi\left[\left[\varepsilon_0\mu_0\right]_{\text{impedance}}^{\text{EM Field}}.\left[m\Omega v^2\right]_{\text{mass velocity}}^{\text{Planck quanta}}\right]$$

creates 3D standing-wave Matter

KG

2D charged fascia



3D Space + Time

3D Matter topology is not a property of 2D mass-energy

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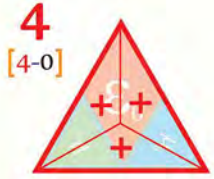
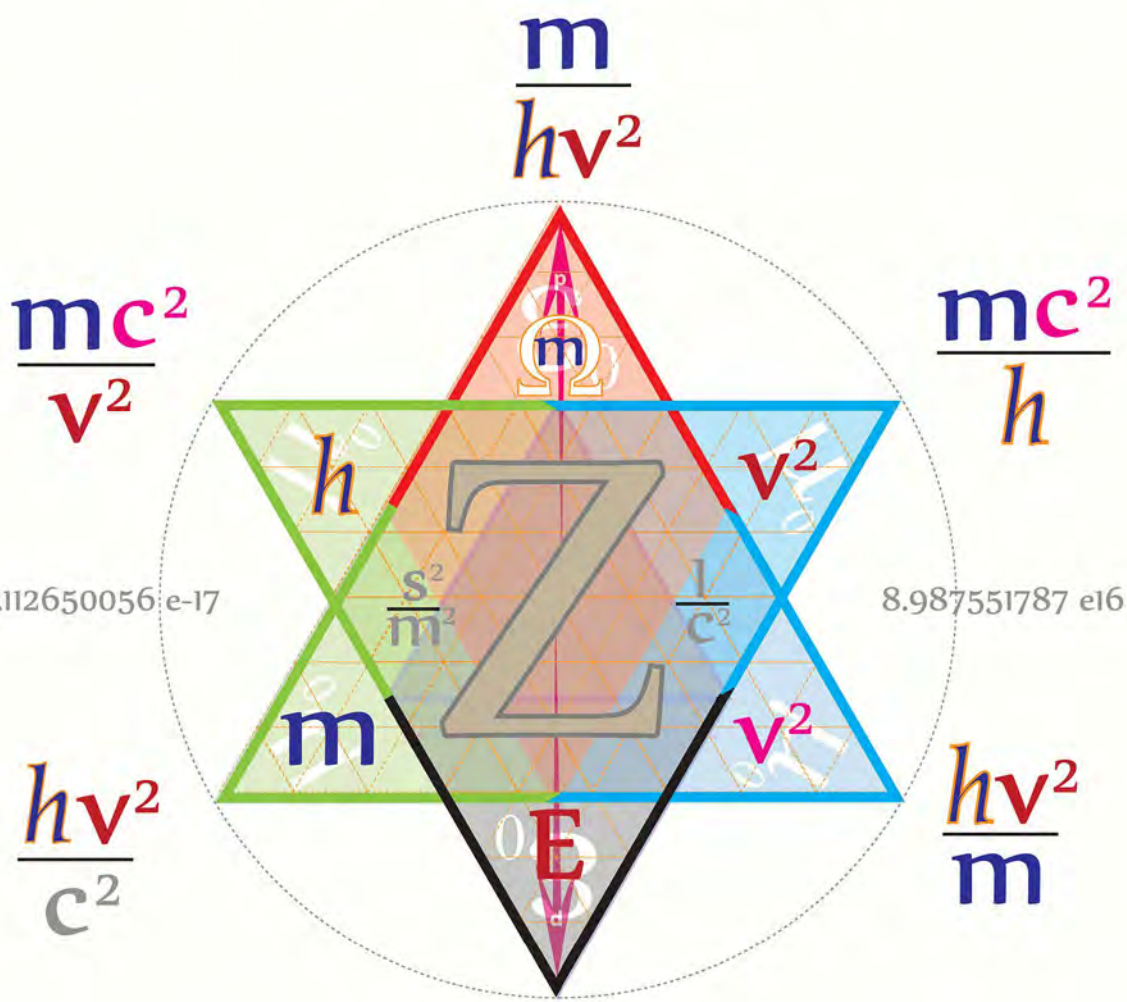
The impedance of any spatial region

is determined by its scalar energy content

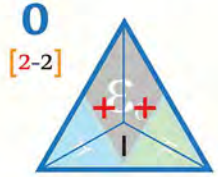


Positive Matter

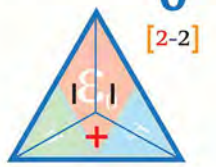
Negative Matter



Neutral Matter



Neutral Matter



The impedance of any medium determines
the velocity of propagation for mass-energy momenta through it

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EM mass vs. Matter

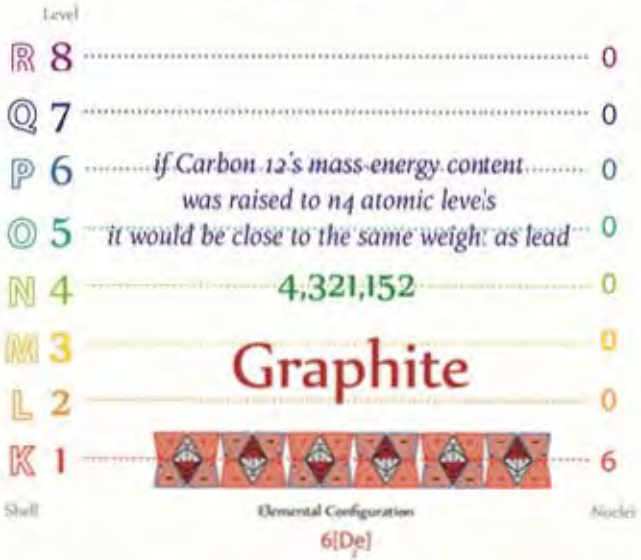
Often a source of confusion,
Tetryonics provides a rigorous
definition of both EM mass & Matter

6.022141579 e23
[Avagadros number]

1 ton of Carbon & 1 ton of Lead
have the same mass-energies

But they have differing Matter topologies
that create a differing energy densities
for any spational region of measurement

1 mole of Carbon atoms
[11.996 grams]



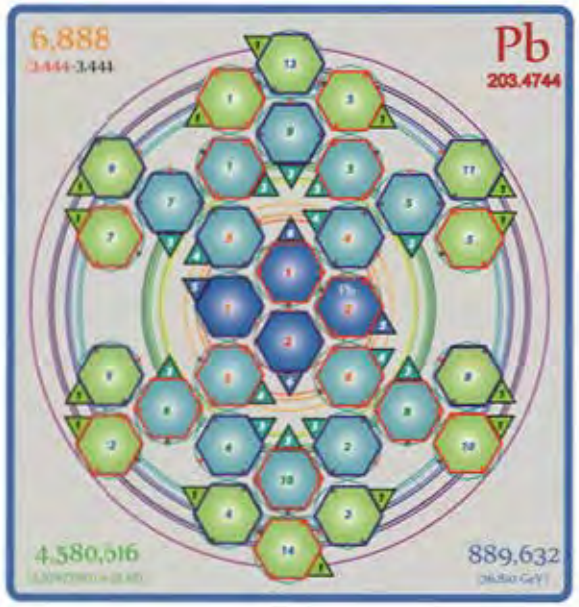
In terms of charged Matter topology
Carbon12 displaces 1/14th the volume of Lead

504
Carbon12 atom
270,072

1 : 17

4,580,616
Lead atom
6,888

In terms of mass-ENERGY-Matter densities
Lead is 17 times denser than Carbon
as a result of the mass quanta per charge fascia



1 mole of Lead
[203.4744 grams]

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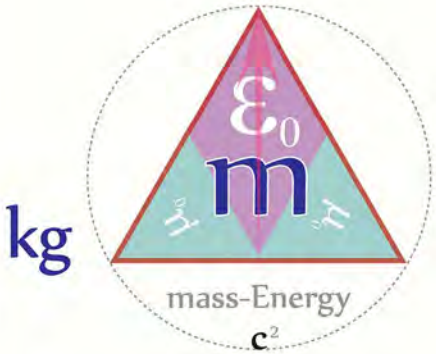
EM mass-energy geometries

are 2D Euclidean EM fields posessing energy momenta

$\frac{\rho}{m^2}$



Charge $\frac{1\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

Bosons $\frac{ODD\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$

Photons $\frac{2\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$

EM waves $\frac{EVEN\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$

mass

$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$

m

ENERGY

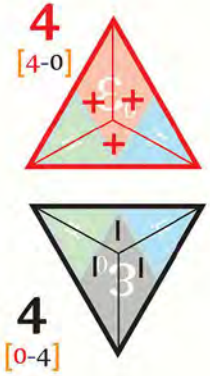
$n\pi\left[\left[m\Omega v^2\right]\right]$

M

Matter

$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$

Equilateral mass-energy geometries & Matter Topologies are measured in radial spatial-time co-ordinate systems



Tetryons $\frac{4\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$

Fermions $\frac{12\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$

Baryons $\frac{36\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$

Deuterons $\frac{84\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$

$\frac{\rho}{m^3}$

KG

Matter Topologies

are 3D standing-wave [4nπ] mass-energy geometries

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mass-energy-Matter quanta

are all defined by charged geometries & topologies

Bosons (v)

Bosons

$$\frac{ODD\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta: mass, velocity

Photons(f)

EM waves

$$\frac{EVEN\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta: mass, velocity

Tetryons (n)

Matter

$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta: mass, velocity

charges

1π	ZPF	v
$_{ODD}\pi$	boson	v

mass-energies

2π	photon	$2v^2$
$_{EVEN}\pi$	EM wave	$2v^2$

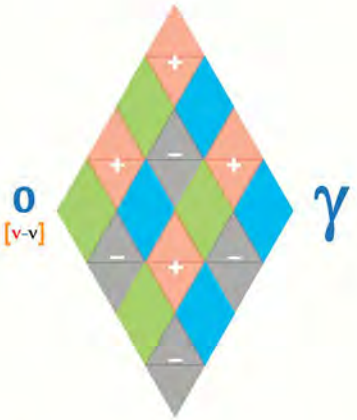
mass-Matter

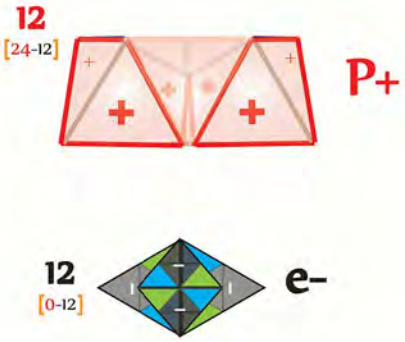
4π	tetryon	n
12π	lepton	n
24π	meson	n
36π	Baryon	n

Inductive charges

EM waves

Matter particles





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Differentiating mass & Matter

geometries topologies

m mass

1 [1-0] 1 [0-1] 0 [v-v]

[f-f]

All modern physical theories including relativity fail to define and differentiate between mass & Matter

M Matter

4 [4-0] 4 [0-4] 0 [6-6] 12 [12-0] 12 [0-12] 12 [24-12] 0 [18-18]

kg

Charged Planck quanta 7.376238634 e-51 kg

Photons 1.475247727 e-50 kg

EM waves 5.900990907 e-50 kg

nπ mass **radiant mass-energies**

Equilateral energy momenta

Tπ Matter **standing-wave Matter**

KG

Neutrino 8.851486361 e-50 kg

Lepton 8.851486361 e-31 kg

Baryon 1.6596536693 e-27 kg

Increasing a particle's speed increases its Kinetic EM mass-energies (rest Matter's EM mass-energy content is velocity invariant)

geometry

Topology

Charge $\frac{1\pi}{c^2}[[m\Omega v^2]]$

Photons $\frac{2\pi}{c^2}[[m\Omega v^2]]$

Bosons $\frac{ODD\pi}{c^2}[[m\Omega v^2]]$

EM waves $\frac{EVEN\pi}{c^2}[[m\Omega v^2]]$

All Matter has EM mass-energies not all EM mass-energies form Matter

Tetryons $\frac{4\pi}{c^4}[[m\Omega v^2]]$

Fermions $\frac{12\pi}{c^4}[[m\Omega v^2]]$

Baryons $\frac{36\pi}{c^4}[[m\Omega v^2]]$

Deuterons $\frac{84\pi}{c^4}[[m\Omega v^2]]$

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6.629432351 e-34 J

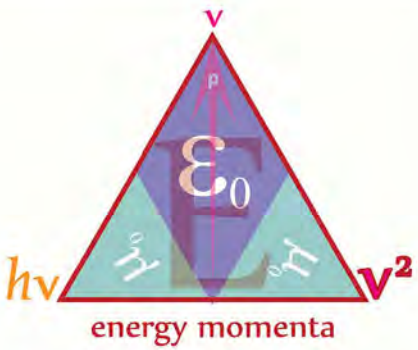
$E = mv^2$

E
Energy
$kg\,\frac{m^2}{s^2}$

$$E_{Energy} = n\pi\left[\left[m_{mass}\,\Omega\,v^2_{velocity}\right]\right]$$

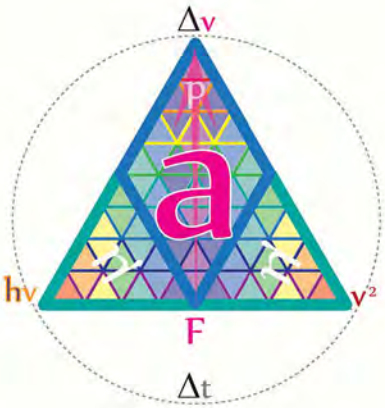
Planck quanta

ENERGY



the proagation velocity of energy is determined by the impedance of any spatial region

$E=hv^2$



$F=ma$

the scalar impedance of space

$\frac{s^2}{m^2}$

$$\varepsilon_0 \times \mu_0$$

Electric permittivity & *Magnetic permeability*

$1.11265\ e\text{-}17\ \frac{s^2}{m^2}$

$\frac{1}{c^2}$

the Forces created by energy momenta in any spatial region are related through the scalar constant of mass

EM mass

$$m = \frac{E}{c^2}$$

m
mass
kg

$$n\pi_{mass}\left[\left[\varepsilon_0\mu_0\right].\left[m_{mass}\,\Omega\,v^2_{velocity}\right]\right]$$

field impedance
Planck quanta
ElectroMagnetic

$7.376238376\ e\text{-}51\ kg$

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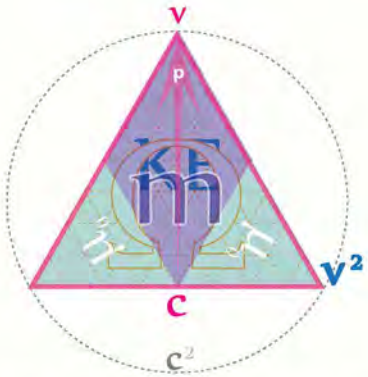
The energy-momenta of Matter

$$\mathbf{p} = m\mathbf{v}$$

Linear correction factor

$$\beta = \left[\frac{v}{c}\right]$$



The Energy comprising all KEM fields is proportional to the particle's velocity

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

Scalar correction factor

$$\mathbf{p}^2 = E = mv^2$$

$$\mathbf{p} = T\pi\left[\left[m\Omega\mathbf{v}\right]_{\text{momenta}}^{\text{Energy}}\right]$$

As the velocity of a particle increases so does its KEM field's mass-energy momentum

$$mv = \mathbf{p} = h\nu$$

$$\text{kg}\,\frac{\text{m}}{\text{s}}$$

$\sqrt{6.629432351\text{ e-}34\text{ J}}$

$$4n\pi\left[m\Omega\mathbf{v}\right]_{\text{mass velocity}}^{\text{Planck quanta}}$$

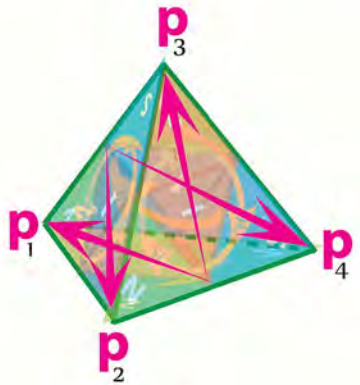
2.5476847 e-17 kg m/s

The linear momentum of mass-energies in standing-wave rest Matter topologies propagates at c

$$\mathbf{p}_M = 4\pi\left[m\mathbf{v}\right]$$

The rest mass of a particle with NO motion is the total EM mass-energy of the particle

Its linear four-momentum is the square root of its scalar energies



rest mass-Matter

In standing-wave Matter, where there is NO external forces acting on the particle, all internal momenta act in opposition and add to ZERO

$$\vec{\mathbf{p}}_0 = \sum^{\text{all fascia}} \vec{\mathbf{p}}$$

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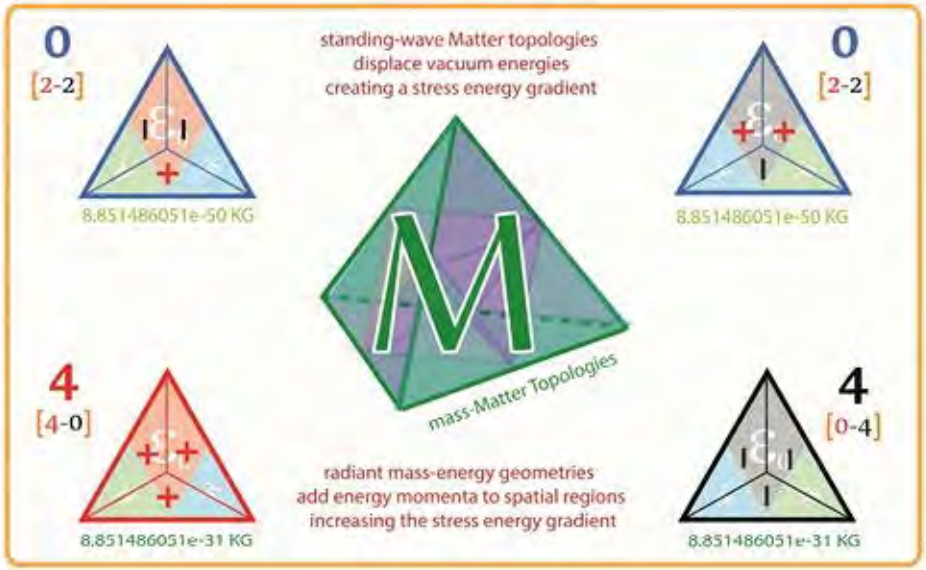
Gravitational mass-Matter quanta

gravity pulls on things proportional to their mass-Matter content

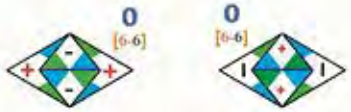
$$F = -G \frac{M_1 M_2}{r^2}$$

Radiant mass-energy geometries

All 3D Tetryonic topologies create displacement Matter volumes that in turn generate KEM fields as a result of the motion of their charge fascia



Standing-wave Matter Topologies



8.851486051e-50 KG

Matter particles can have the same Tetryonic topologies but possess a differing charged mass-energy momenta content

8.851486051e-31 KG

Gravitational Attraction can be modelled as a dipole attraction of opposite charged mass fascia of Matter topologies through its differing energy field interactions

Gravitation attraction is a strictly UNI-DIRECTIONAL CONVERGENT FORCE

$k = 8.99\ e9\ \frac{N\ m^2}{C^2}$

$G = 6.67\ e\text{-}11\ \frac{N\ m^2}{KG^2}$

KEM field energy momenta produce a BI-DIRECTIONAL INTERACTION FIELD

Gravitation attraction is 20 orders of magnitude weaker

KEM field energy momenta produce a BI-DIRECTIONAL INTERACTION FIELD

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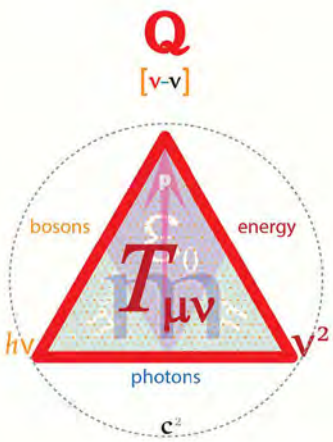
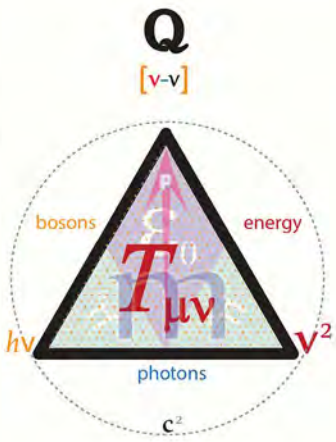
Stress energy gradients

Energy's highest density form is 3D Matter [comprised of planar 2D EM mass-energies]
whilst its lowest pressure form is the vacuum energies created by radiated mass-energies filling space

ENERGY in all its forms
seeks equilibrium

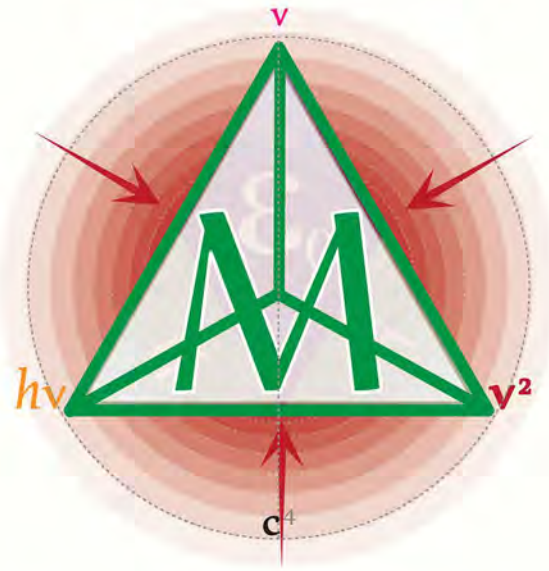




Where Newton's Law of Gravitation is modelled on geometric means

$$F = k \frac{Q_1 Q_2}{r^2}$$

Inverse Square Law



Einstein's General Relativity is modelled on energy pressure

$$PV = nRT$$

Matter tells Spacetime how to bend
Spacetime tells Mater how to move

$$F = -G \frac{M_1 m_2}{r^2}$$

Like any pressure gradient, ENERGY always flows from areas of highest density to regions of low density seeking to reduce 'pressure' differentials and reach a state of equilibrium.

$$R_{\mu\nu} - \tfrac{1}{2} R g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

mass-Matter topologies create stress energy differentials in the vacuum energies of space

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Gravitational Matter & weight

is a measure of the amount of mass-energy in Matter

The gravitational mass of a body determined by its response to the force of gravity

mass-Matter

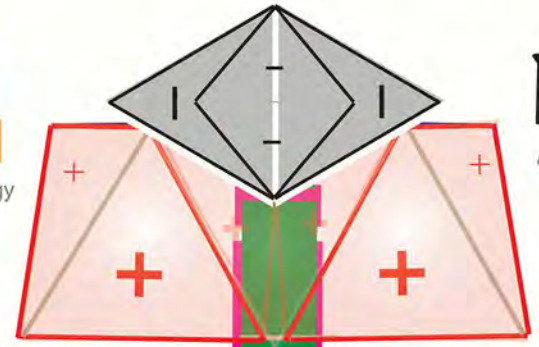
Matter

$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta; mass; velocity

The gravitational acceleration of a body in any gravity field is uniform and proportional to its mass-Matter

$$w = F = M.g$$



48

[24-24]

charge topology

N_A

Avagadro

electrons

$$\frac{12\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta; mass; velocity

mass-energy-Matter

8.8514586361 e-31 KG

Baryons

$$\frac{36\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta; mass; velocity

mass-energy-Matter

1.659653693 e-27 KG

22,512

mass-Matter

1.66053841 e-27 KG

mass-Matter quantum

.001 KG

molar mass

w=M.g

lg

weight

9.8 m/s²

KG

$F=Ma_g$

= [.001] x [9.8]

= .0098 N

g

Force

$$\frac{\left[kg\,\frac{m}{s^2}\right]}{KG}$$

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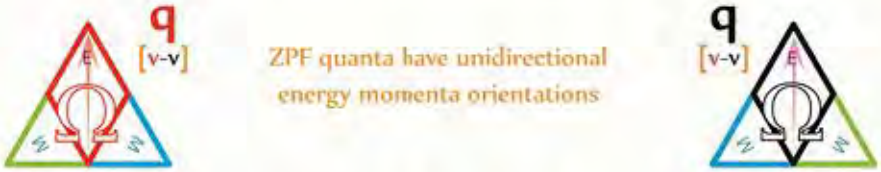
Zero Point Fields

'ZPF quanta charges are the opposite sides of the same 'quantum coin'



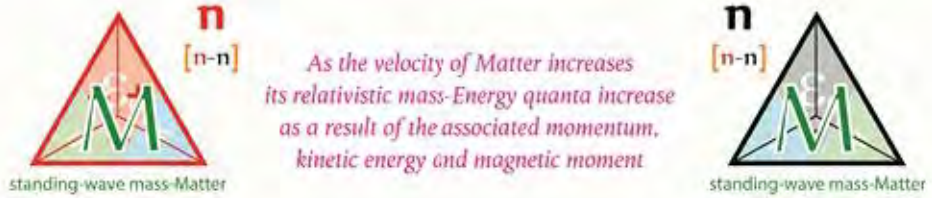
ZPF quanta have unidirectional energy momenta orientations

KEM fields

N-S magnetic moment vector

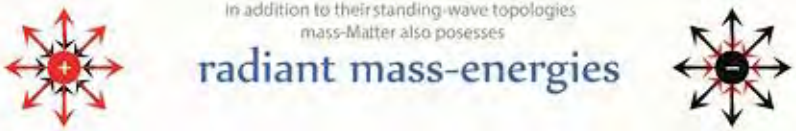
S-N magnetic moment vector

As the velocity of Matter increases its relativistic mass-Energy quanta increase as a result of the associated momentum, kinetic energy and magnetic moment



standing-wave mass-Matter

standing-wave mass-Matter



in addition to their standing-wave topologies mass-Matter also posesses

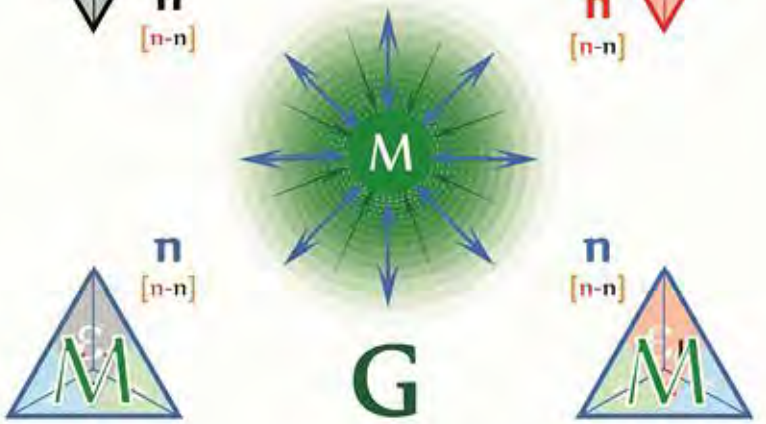
radiant mass-energies

Gravity & EM fields

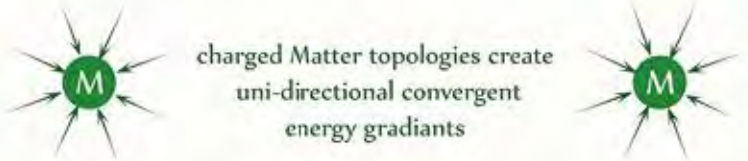
All energy fields are velocity dependent and combine to form vectorial K-EM fields

All charged Matter posseses bi-directional interactive radiant EM fields

EM



G



charged Matter topologies create uni-directional convergent energy gradiants

All mass-Matter is velocity invariant and creates convergent G fields

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Matterless EM mass-energies

Photons are often termed as 'mass-less' particles in physics which is a complete mis-nomer.
Leading to many erroneous supersitions on the true nature and physics of light and gravity

$$\frac{E}{c^2} = m$$ mass geometry

$$M = \frac{E}{c^4}$$ Matter topology

mass is a measure of planar Energy per second

mass-less infers no energy momenta

Photons are weightless radiant EM energies not massless particles

photons possess 2D planar radiant EM mass-energy momenta

A Particle has a charged Matter topology

Matter is a closed tetrahedral standing-wave energy possessing volume

photons & EM waves have no 3D Matter topology, they are Matter-less geometries

$$\text{ENERGY}\ n\pi\left[\left[m\Omega v^2\right]\right]$$ Planck quanta; mass; velocity

$$c^2$$

second

$$\frac{\text{mass}}{c^2}\ n\pi\left[\left[m\Omega v^2\right]\right]$$ Planck quanta; mass; velocity

$$\text{Matter}\ \frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$ Planck quanta; mass; velocity

The definition and distinction between mass & Matter
is a major failing of modern physics, corrected for by Tetryonic theory

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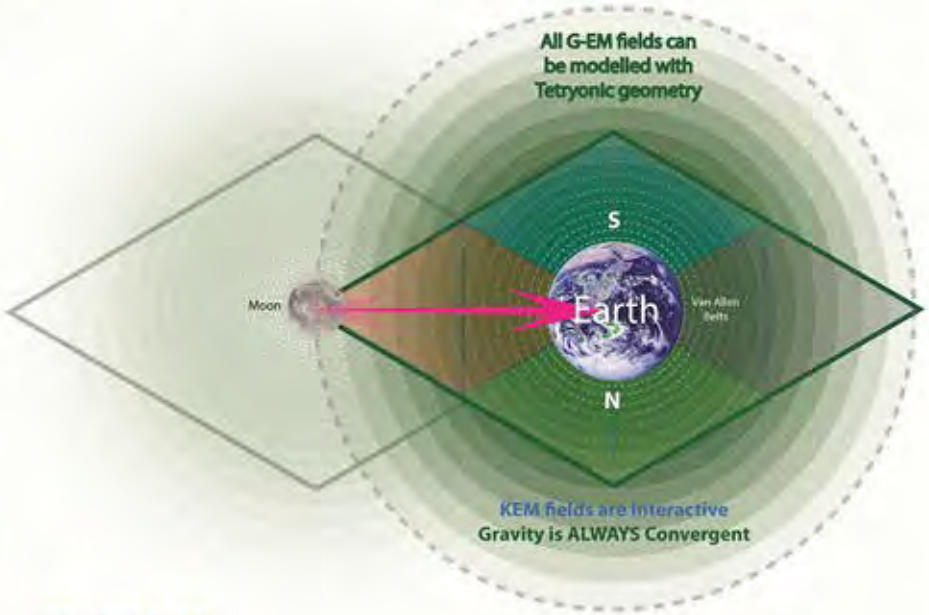
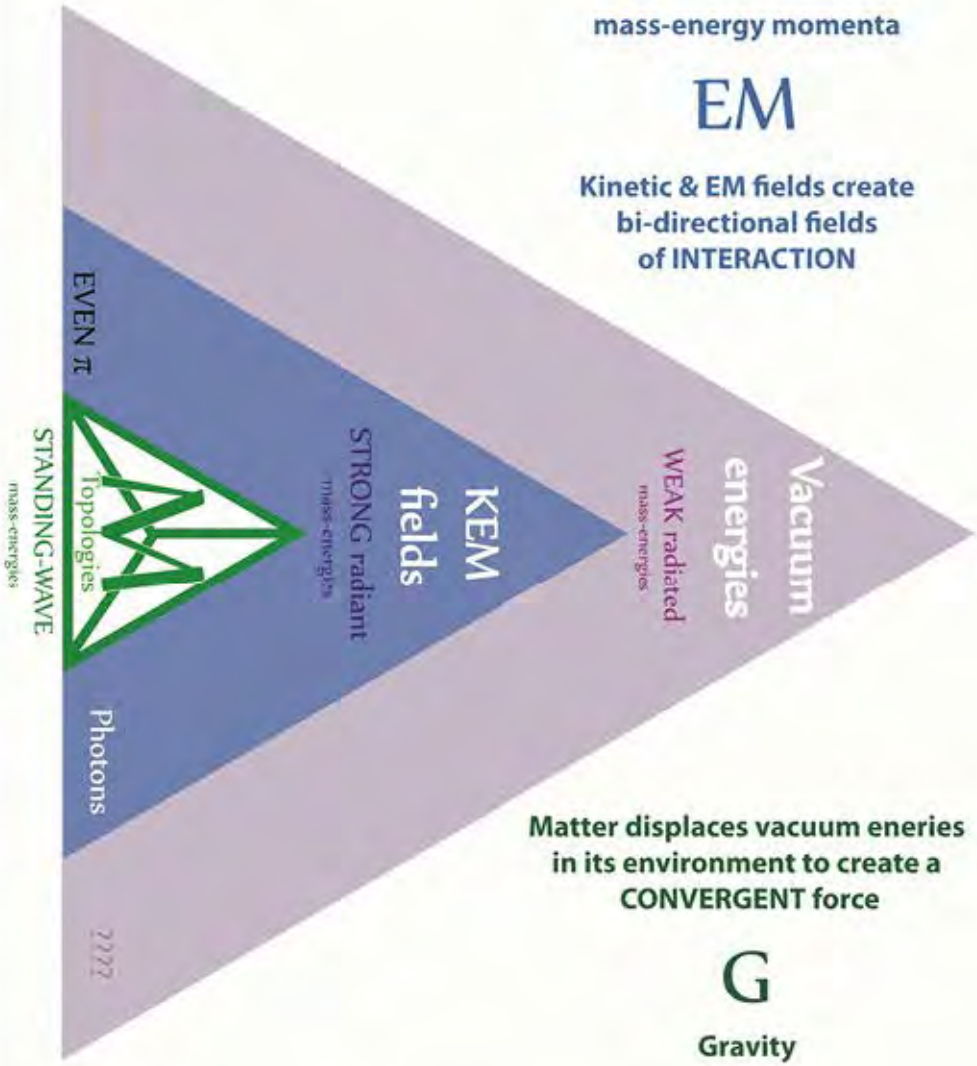
EM fields, vacuum energies and gravity

all result from radiant equilateral mass-energy momenta
and standing-wave Matter in radial space

$$F = k \frac{Q_1 Q_2}{r^2}$$





mass-energy momenta

EM

Kinetic & EM fields create bi-directional fields of INTERACTION

All GEM fields have equilateral quantum geometries

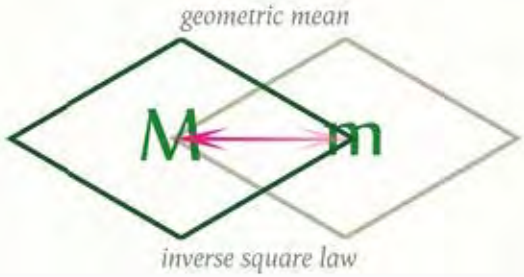
Matter displaces vacuum eneries in its environment to create a CONVERGENT force

G

Gravity

the proportional attraction of material bodies towards each other can be easily modeled with Tetryonic fields

$$F = -G \frac{M_1 m_2}{r^2}$$



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Charges vs. Gravity

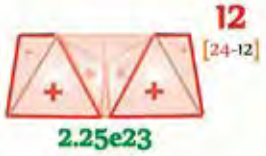
both can be modelled as interactive or attractive geometric forces

Charged particles are comprised of non-neutralised Planck quanta

Neutral Matter is comprised of neutralised Planck quanta

$$F = k\frac{Q_1 Q_2}{r^2}$$

$$F = -G\frac{M_1 M_2}{r^2}$$



Charges produce bi-lateral interactive forces

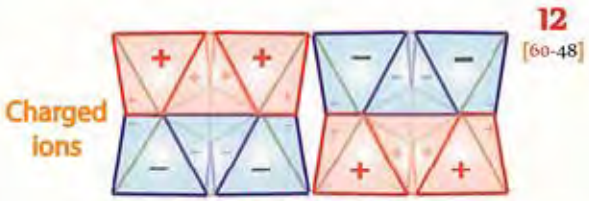
mass

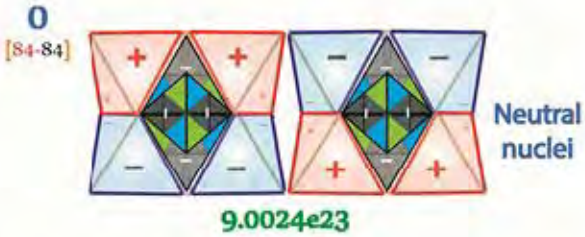
Matter

Nuclei

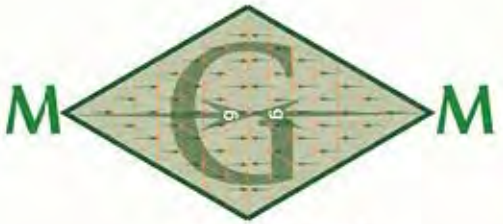
Elements

Gravity is a convergent attractive force





Opposites Attract
Similars Repel



Gravitational Matter is always Attractive

Interactive mass-energies & **Gravitational mass-Matter**

both produce inverse squared forces

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$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

GravitoElectroMagnetism, (abbreviated GEM), refers to a set of formal analogies between Maxwell's field equations and an approximation, valid under certain conditions, of the Einstein field equations for General Relativity.

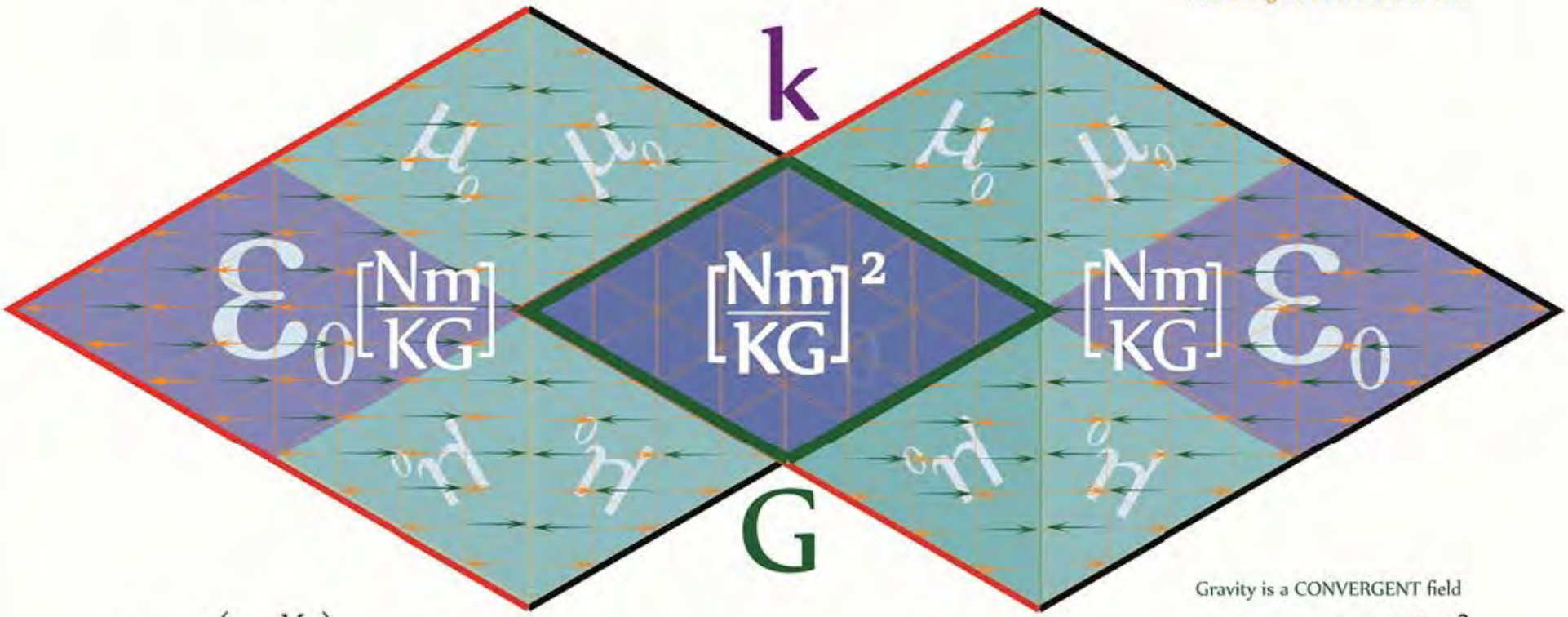
$$\nabla \cdot \mathbf{B} = 0$$

$$\mathbf{F} = q\left(\frac{-1}{4\pi\varepsilon_0}\frac{Q}{r^2}\hat{\mathbf{r}}\right) = q\mathbf{E}$$

$$F = k\,\frac{Q_1 Q_2}{r^2}$$

$$k = 8.99 \times 10^9 \frac{\mathrm{N\,m^2}}{\mathrm{C^2}}$$

nett Charge is a DIVERGENT field



Gravity is a CONVERGENT field

$$\mathbf{F} = m\left(-G\frac{M}{r^2}\hat{\mathbf{r}}\right) = m\mathbf{g}.$$

$$F = -G\,\frac{M_1 M_2}{r^2}$$

$$G = 6.67 \times 10^{-11} \frac{\mathrm{N\,m^2}}{\mathrm{kg^2}}$$

$$\nabla \times \mathbf{E}_g = -\frac{\partial \mathbf{B}_g}{\partial t}$$

GEM fields are an accurate way of modelling Gravitational attraction between massive bodies using weak KEM field vectors

$$\nabla \cdot \mathbf{B}_g = 0$$

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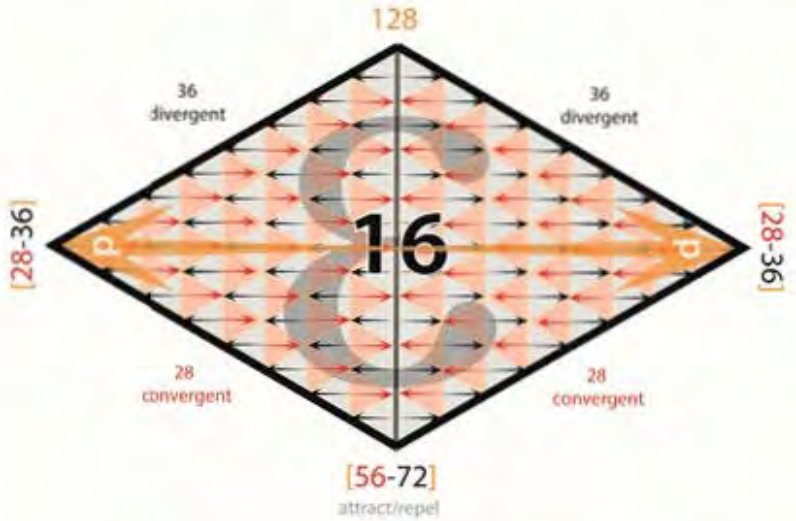
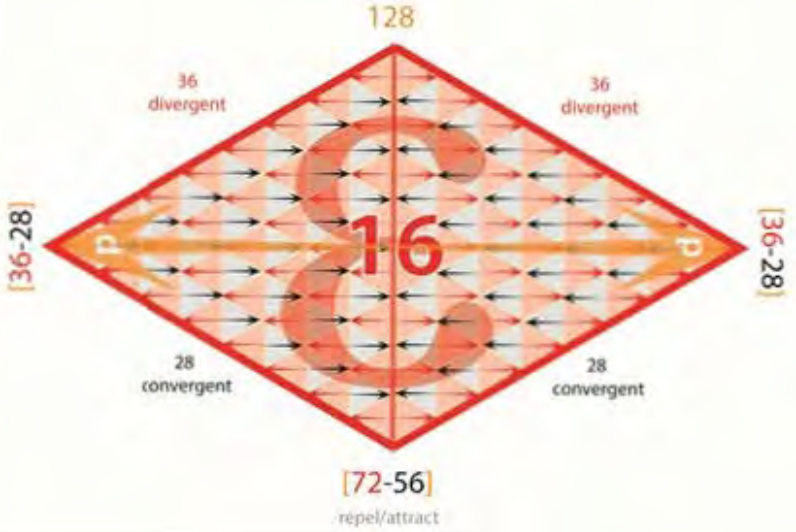


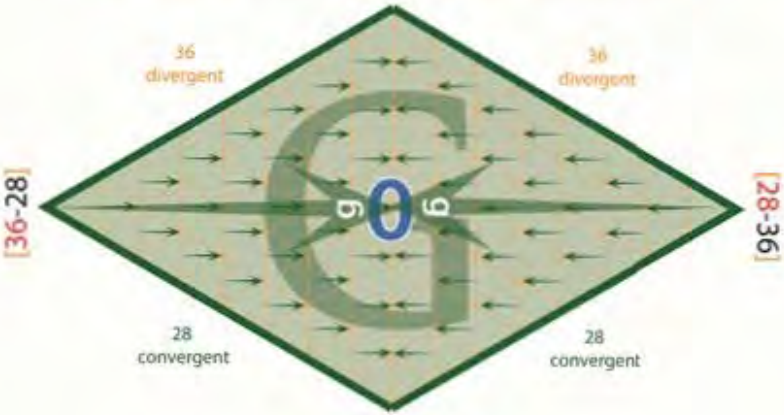


Gravitational fields can be modelled as weak convergent EM fields

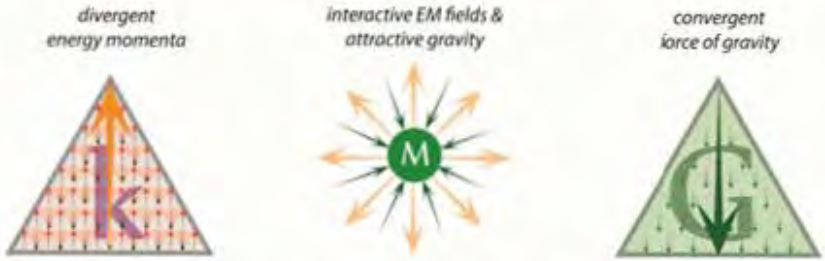
Electrostatic fields

Charges attract or repel dependent on polarity
Neutral Matter is largely unaffected (equally repel & attract)

Charged Matter INTERACTS electrically



All Matter ATTRACTS gravitationally



Nett KEM field interaction is divergent from source
Gravitational attraction is the convergent mean force between two sources

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Gravitational & Electric constants

are scaling constant relating Gravitational gradients to superpositioned EM fields

[1665]

Newton was the first to apply the Inverse Square law to Gravity

but was unaware of ElectroMagnetic forces

GEM

Gravito ElectroMagnetism

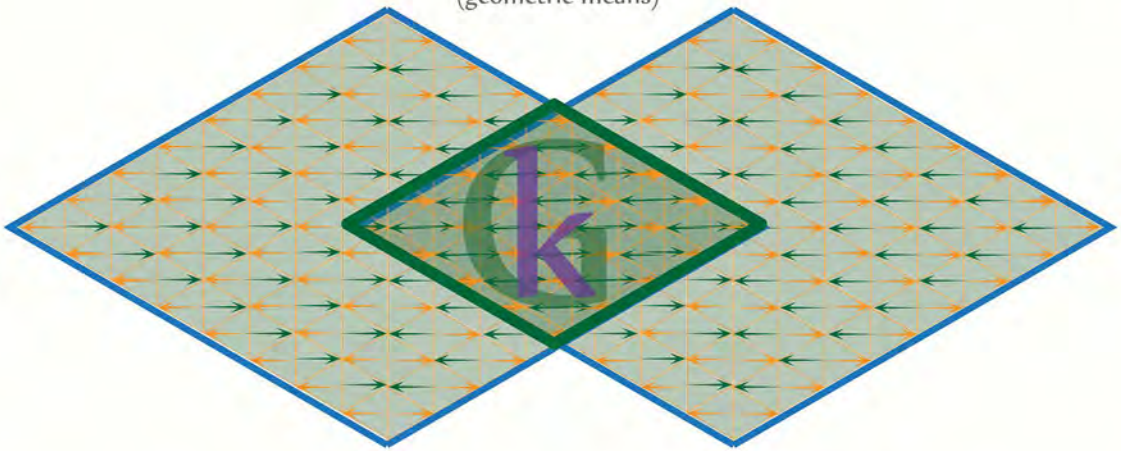
[1769]

Coulomb applied the Inverse Square Law to Charge Interactions

and obtained the value for the Electric Constant

Newton's convergent Gravity & Couolomb's Charge interaction
both follow inverse squared laws
(geometric means)

Attractive Gravity has the negative vector of nett Charge Interaction



Interactive EM fields are 20 orders of magnitude stronger than Gravity

'Graviton'
Gravitational 'charge' carrier

Convergent force vectors

superpositioned EM fields can be used to model the strength and direction of the weaker Graviational force vectors at any point in the fields as they are both inverse squared forces

Producing the ongoing speculation of the existence of a gravitational charge carrier

(an erroneous assumption that stems from using mathematics alone, without a solid understanding of geometric mass-energies & Matter topologies)

Photon
Electric charge carrier

Divergent force vectors

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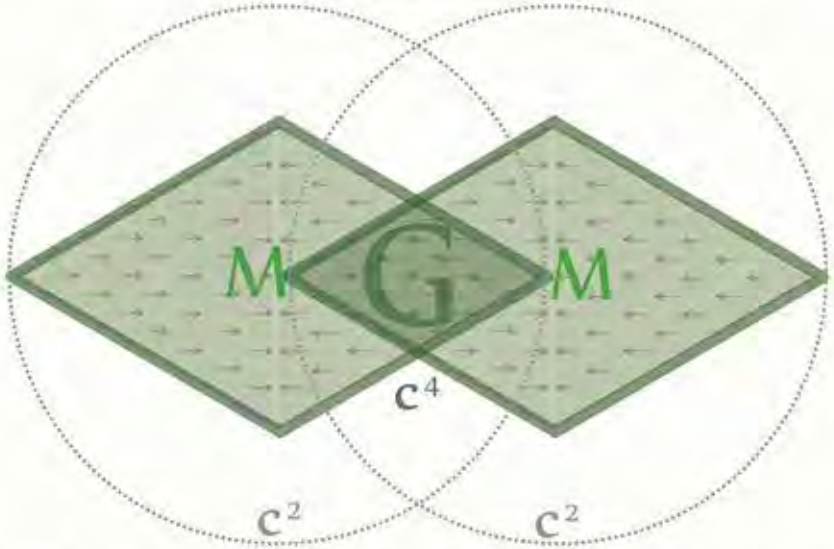
Newton's attractive Gravity & Coulomb's Charge interaction
both follow inverse square laws

Instantaneous
action-at-a-distance

The Force of Gravity

Absolute
Space & Time
(x,y,z) (t)



Gravitational action
limited to c

mass-ENERGY-Matter

Curved relativistic
Spacetime
(x,y,z,t)

Modelling Gravity with EM field geometries

while superpositioned EM fields can be used to model the strength and vector direction
of weaker Gravitational fields at any point in time within the field geometry
they DO NOT reflect the actual physicality of the fields involved

$$R_{00} = 4\pi\rho$$

The speed of Gravity is not limited to c as changes to the energy density-pressure gradient are immediately translated through the aether from one object to the other

$$R_{\mu\nu} - \tfrac{1}{2}R g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

Gravity is a the pressure gradient created by the displacement of vacuum energies though the presence of 3D mass-Matter topologies in any region of space

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Fields of Interaction

All topological Matter in motion creates a interactive Kinetic EM field in addition to its inherent convergent Gravitational field

Convergent Gravity fields produce a uni-directional attraction between two or more Matter topologies

Divergent EM fields produce a bi-directional interactive force between charged objects

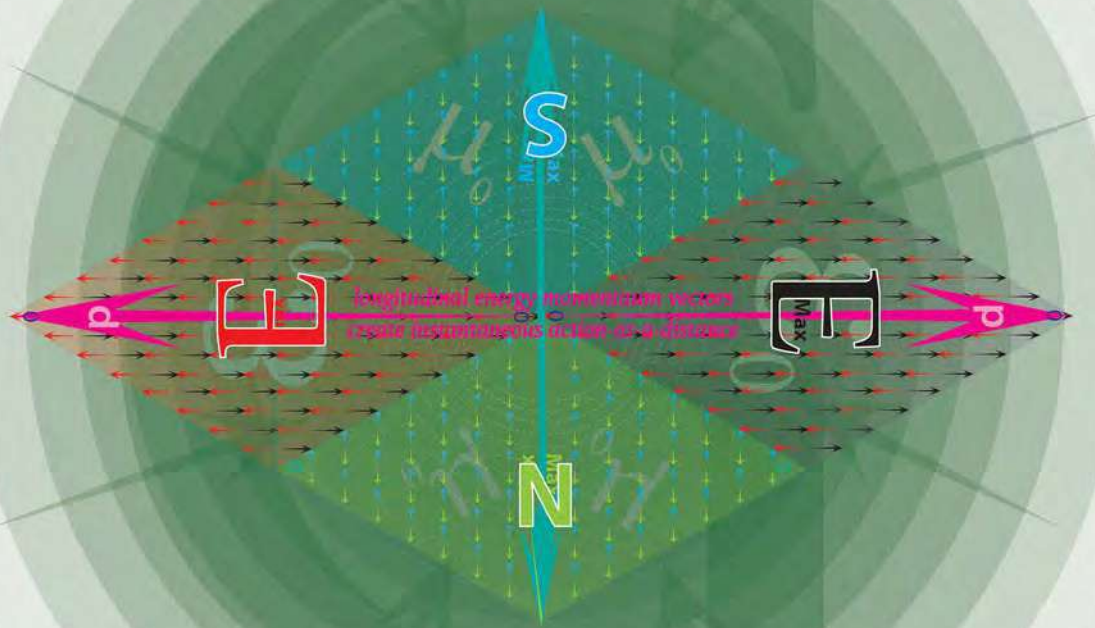
Interactive EM fields of force are created by geometrically superpositioned equilateral energy momenta vectors

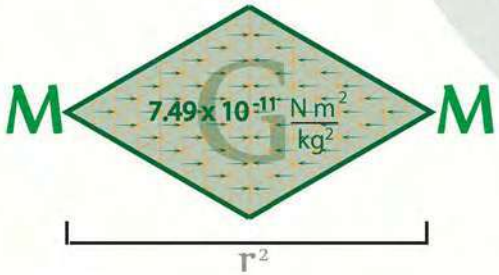
G fields

G

E fields

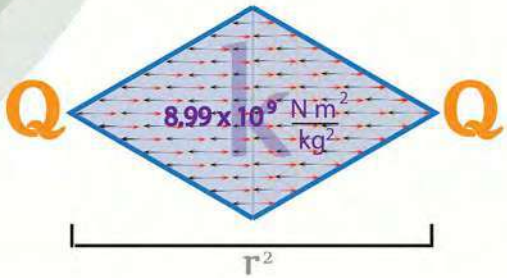
EM





Gravitational fields of force are created by the displacement of vacuum energies by Matter topologies

Gravito-Electro-Magnetic Fields



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GEM gradients

The gravitational field of Material objects is the result of zero energy nullspace volumes encompassed by all Matter which in turn creates a displacement energy pressure differential gradient with the surrounding Vacuum Energies

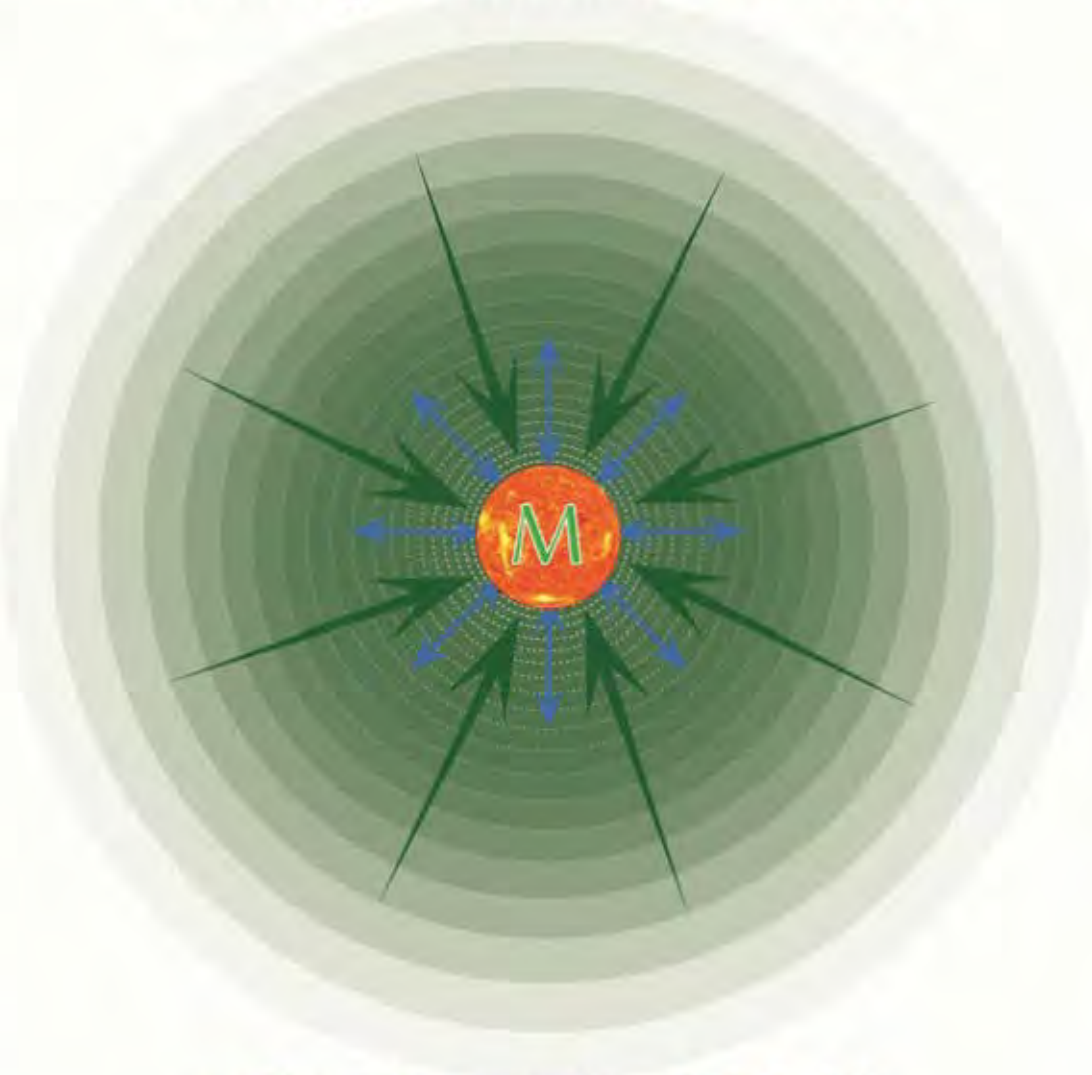
Gravitational attraction can be modelled as a CONVERGENT EM FIELD created by the nullspace differential of Matter

All Matter in motion creates an eternally dynamic system of Gravitational fields and radiative ElectroMagnetic Energies

EM radiation is a bidirectional DIVERGENT-CONVERGENT FIELD resulting from quanta imbalances

radiative EM fields are created by all Matter as it seeks equilibrium with its environment, the impedance of space creates a propagation velocity equal to the speed of light

convergent Gravitational fields



radiant interactive EM fields

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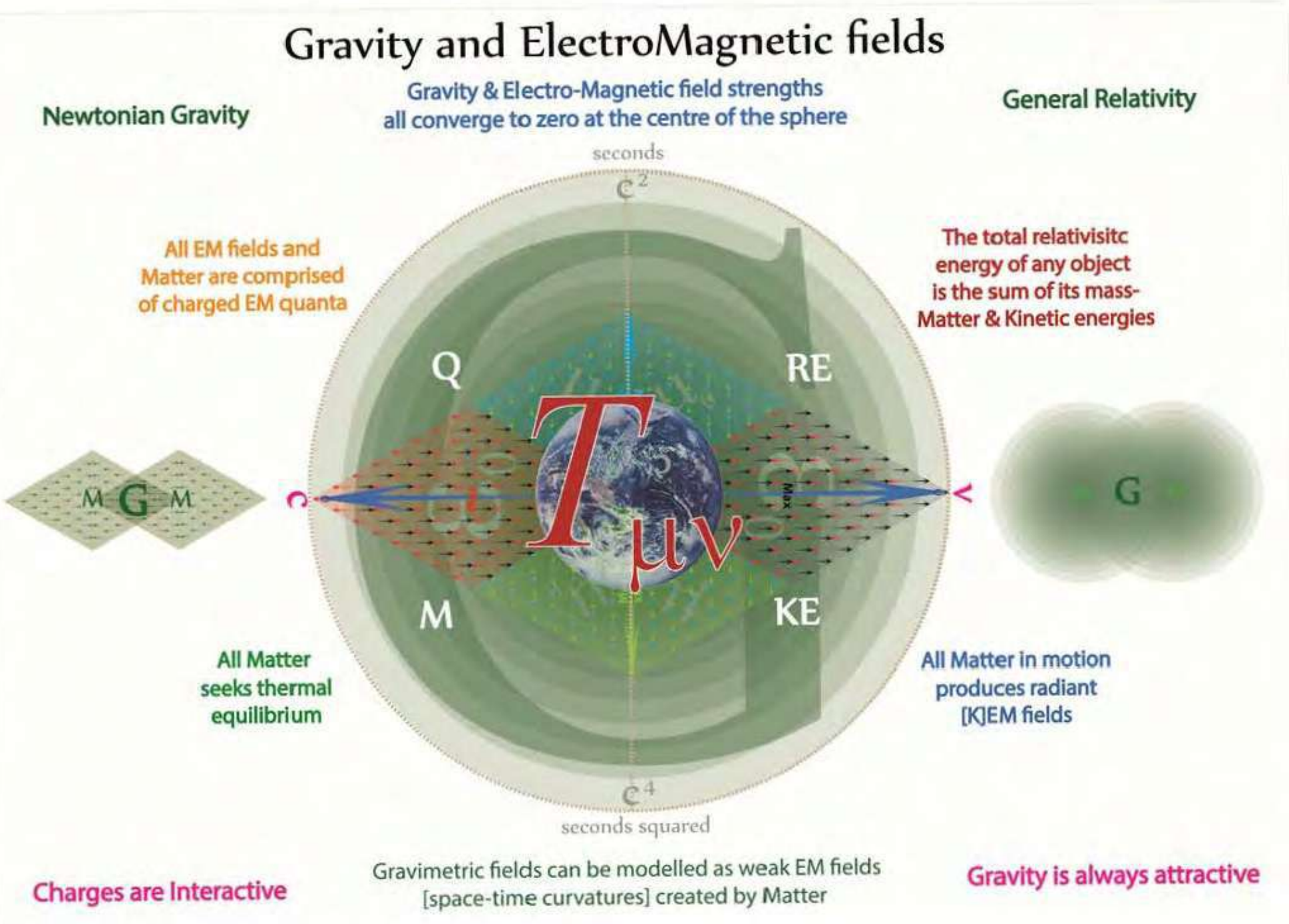
Gravity and ElectroMagnetic fields



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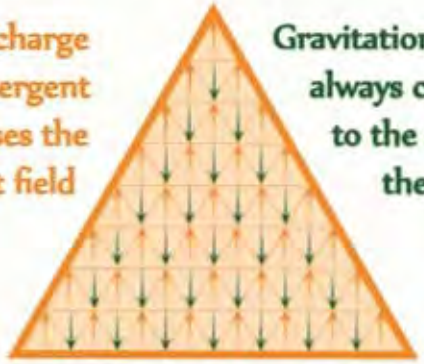
Electric vs Gravitational Fields

C

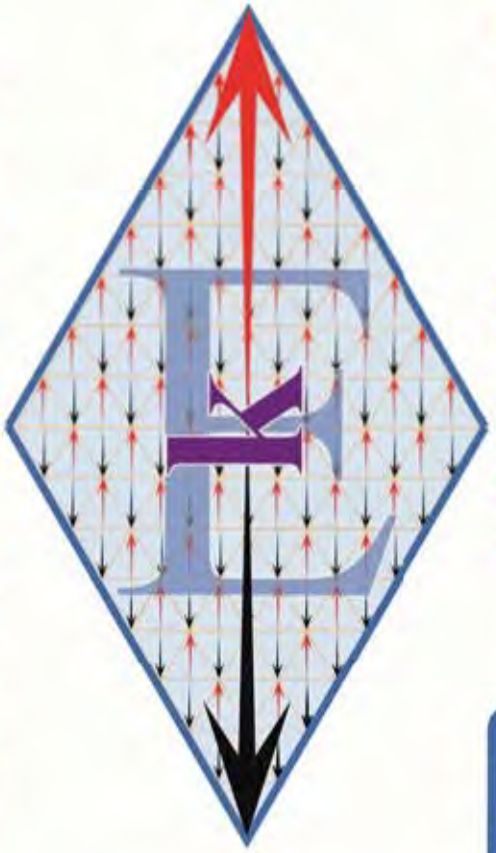
KG

In fields of charge the nett divergent field encloses the convergent field

Gravitational fields are always convergent to the source of the field



interactive electrostatic fields



nett Divergent Field

SR

Using Special relativity as the basis for the development of a General theory of Relativity to model Gravity is problematic
[as SR models EM interactions]

GR

strictly Convergent Field

attractive gravitational fields

Field	Units	Equation
Gravity	$\vec{g} = \frac{\text{newtons}}{\text{kilogram}} \left(\frac{N}{kg}\right)$	$\vec{F} = m\vec{g}$
Electricity	$\vec{E} = \frac{\text{newtons}}{\text{coulomb}} \left(\frac{N}{C}\right)$	$\vec{F} = q\vec{E}$

Electrical interaction is the result of the nett EM geometry of [K]EM fields

Q

Gravitational attraction is the result of the displacement topology of Matter

M

The similarities between Electro-Magnetic and Gravitational fields can be shown by modelling their effects through EM field geometries

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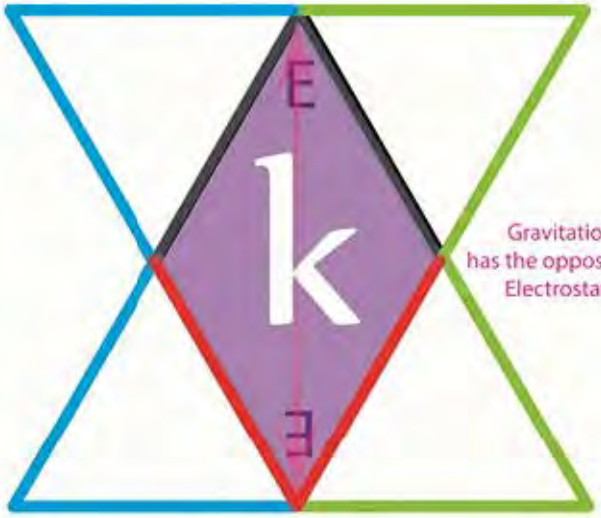
Electric fields and Gravitation

Electrostatic forces are much greater than Gravitational forces (by about 10^20 times).
The force of gravity is attractive for all Matter, whereas electrostatic forces are repulsive for like charged Matter,
There are no negative [repulsive] gravitational charges, while there are both positive and negative electric charges.

Electrostatic forces are interactive
while Gravitational forces are always attractive



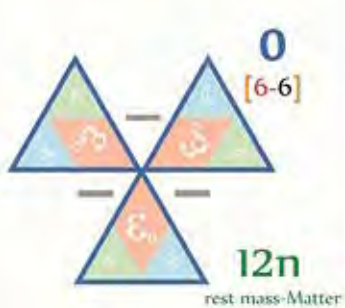
Gravitational attraction
has the opposite force vector of
Electrostatic interaction

All ElectroMagnetic field quanta are subject to
Lorentz wavelength-frequency corrections due to velocity

Gravitational Matter topologies are NOT affected by
Lorentz corrections due to their velocity of motion

There are similarities between the Electric field and the Gravity field of Matter,
(so sometimes Matter is refered to as "gravitational charge")

Both act in a vacuum and are central and conservative.
Both obey an inverse-square law (both are inversely proportional to square of r).
Both field types propagate at the finite speed of c, the speed of light.
Electric charges and EM mass-energies are conservative



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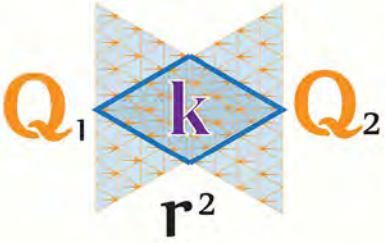
Charge vs Gravitation

[empirically determined value]
8.987551787e9 N



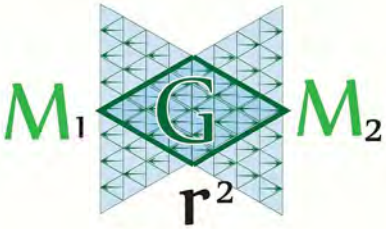
"The magnitude of the electrostatic force between two charges is directly proportional to the product of the magnitudes of each charge and inversely proportional to the square of the distance between the charges."

Charge interaction can be modelled as a DIVERGENT EM FIELD

We have two fundamental laws stating that the forces between two particles are directly proportional to the product of their charges/masses and inversely proportional to the square of the distance between them

Gravitational attraction can be modelled as a CONVERGENT EM FIELD

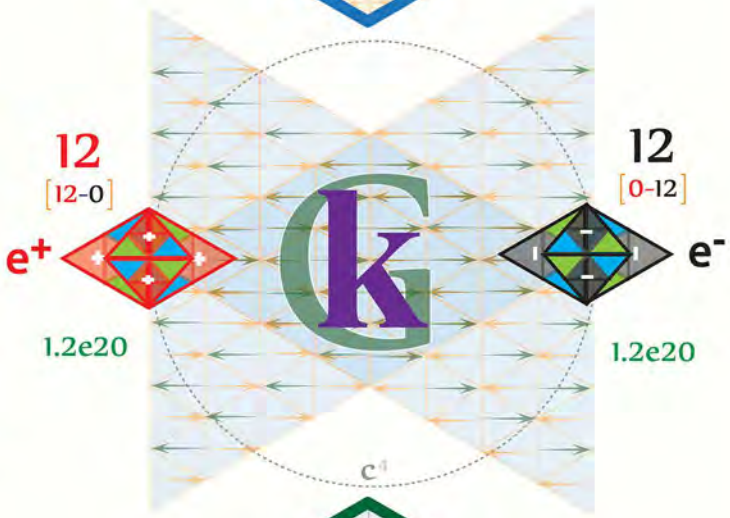
"The magnitude of the gravitational force between two masses is directly proportional to the product of the magnitudes of each mass and inversely proportional to the square of the distance between the charges."



6.67428e-11 N
[empirically determined value]

Coulombic interaction is proportional to Charge
(energy geometry imbalances)

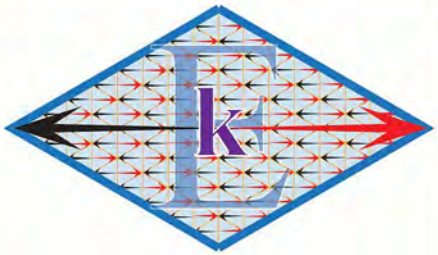
$$F = k \frac{Q_1 Q_2}{r^2}$$



$$F = -G \frac{M_1 M_2}{r^2}$$

Gravitational attraction is proportional to Matter
(total rest EM mass-energy content)

It can now be clearly demonstrated that ***Newtonian Gravity*** *can be modelled as a weak convergent Electro-Magnetic Force*



$$\frac{k}{G} \quad \frac{8.9875 \text{ e9 N}}{6.67384 \text{ e-11 N}}$$

$$= 1.346 \text{ e20}$$

The field strength differential is reflective of the Compton frequency of electron [1.20 e20 quanta]

Einstein's general relativity offers a different model of Gravitational attraction however

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Gravito-Electro-Magnetic interaction

The ElectroMagnetic [Coulombic] field strength is proportional to an object's relativistic charge

$$F \propto \frac{Q_1 Q_2}{r^2}$$

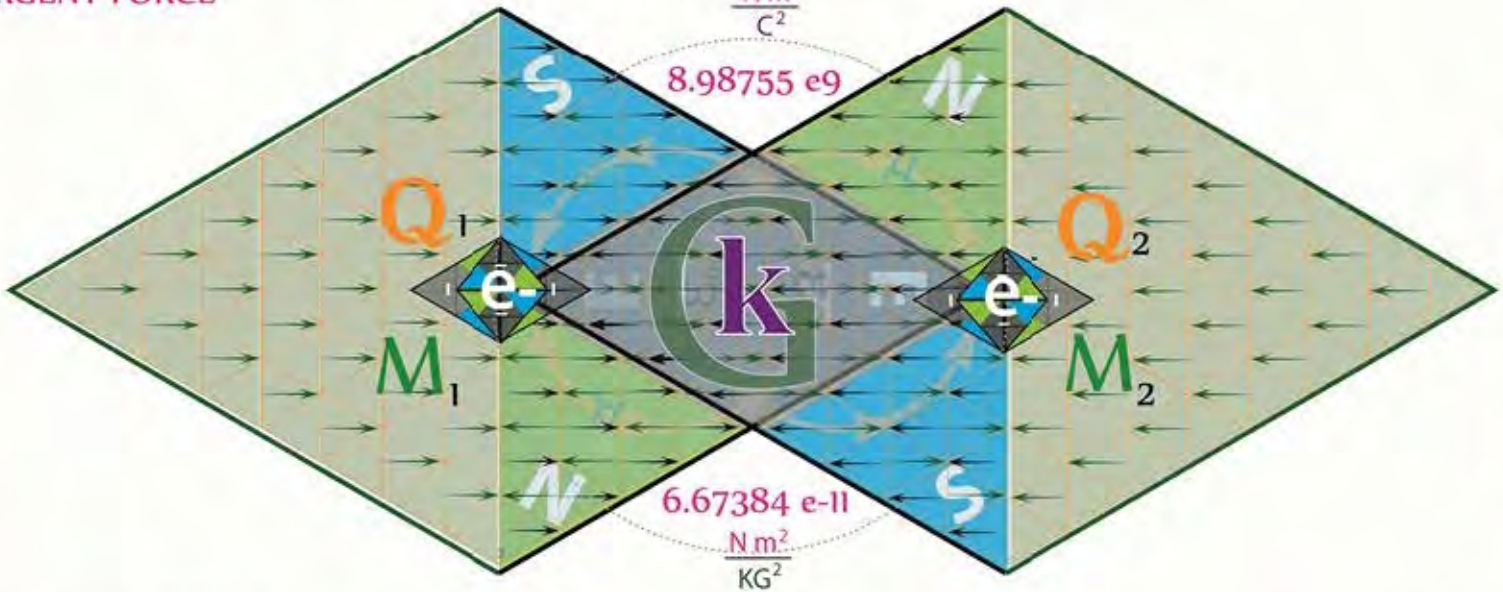
Charge interactions can be modelled as a superpositional DIVERGENT FORCE

12 [0-12] — k / r^2 — 12 [0-12]

$$F = k \frac{Q_1 Q_2}{r^2}$$

$\frac{N\,m^2}{C^2}$

8.98755 e9



6.67384 e-11 $\frac{N\,m^2}{KG^2}$

equilateral mass-energy momenta quanta create the interactive fields of Force between material bodies of Matter

The attractive strength of Gravity is 20 orders of magnitude weaker than the strength of Electrostatic interaction

Gravitational attraction can be modelled as a superpositional CONVERGENT FORCE

1.2e20 — G / r^2 — 1.2e20

$$F = -G \frac{M_1 m_2}{r^2}$$

$$F \propto \frac{M_1 m_2}{r^2}$$

Gravitational field strenth is proportional to the rest Matter topology (and can be modelled with weak coulombic fields)

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Charged Matter Gravitational interactions

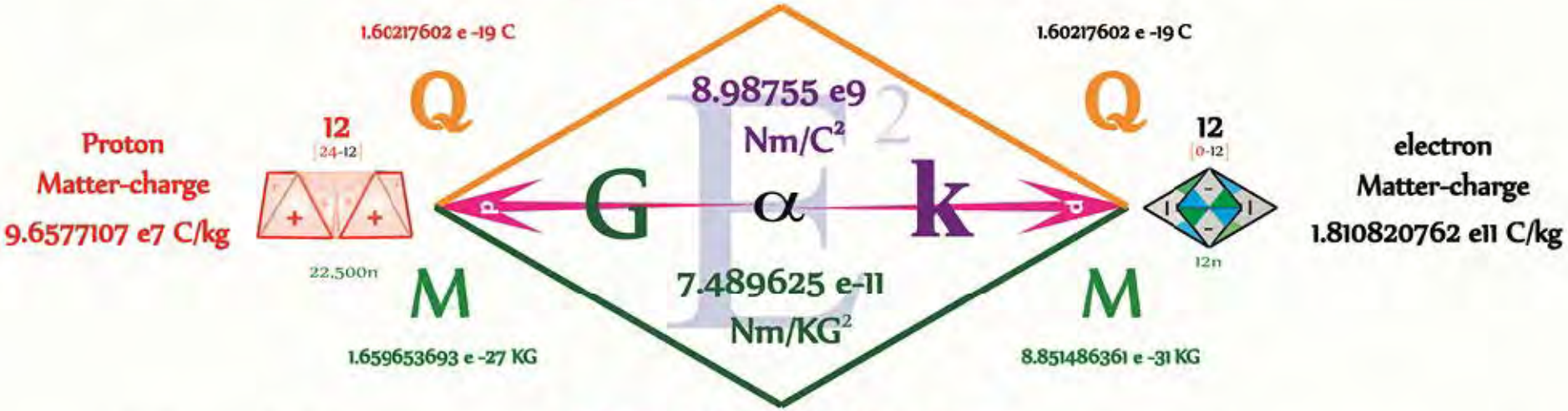
Electrostatic force fields dominate Gravitational fields
and can be modelled via their superpositioned
energy momenta force fields

Following the field symmetries provided by Tetryonic geometry we can now model all fields

$$F = k \frac{Q_1 Q_2}{r^2}$$

2.30900415 e-28 Newtons

Electromagnetic interactions as well as the convergent Gravitational atraction



Reflecting all of the geometric force interactions in terms of EM mass-ENERGY &Matter

1.10025594 e-67 Newtons

$$F = -G \frac{M_1 m_2}{r^2}$$

Allowing an accurate value of the graviationl constant to be derived

Gravity [like electrostatic] fields
can be modelled as superpositioned
Energy momenta force fields

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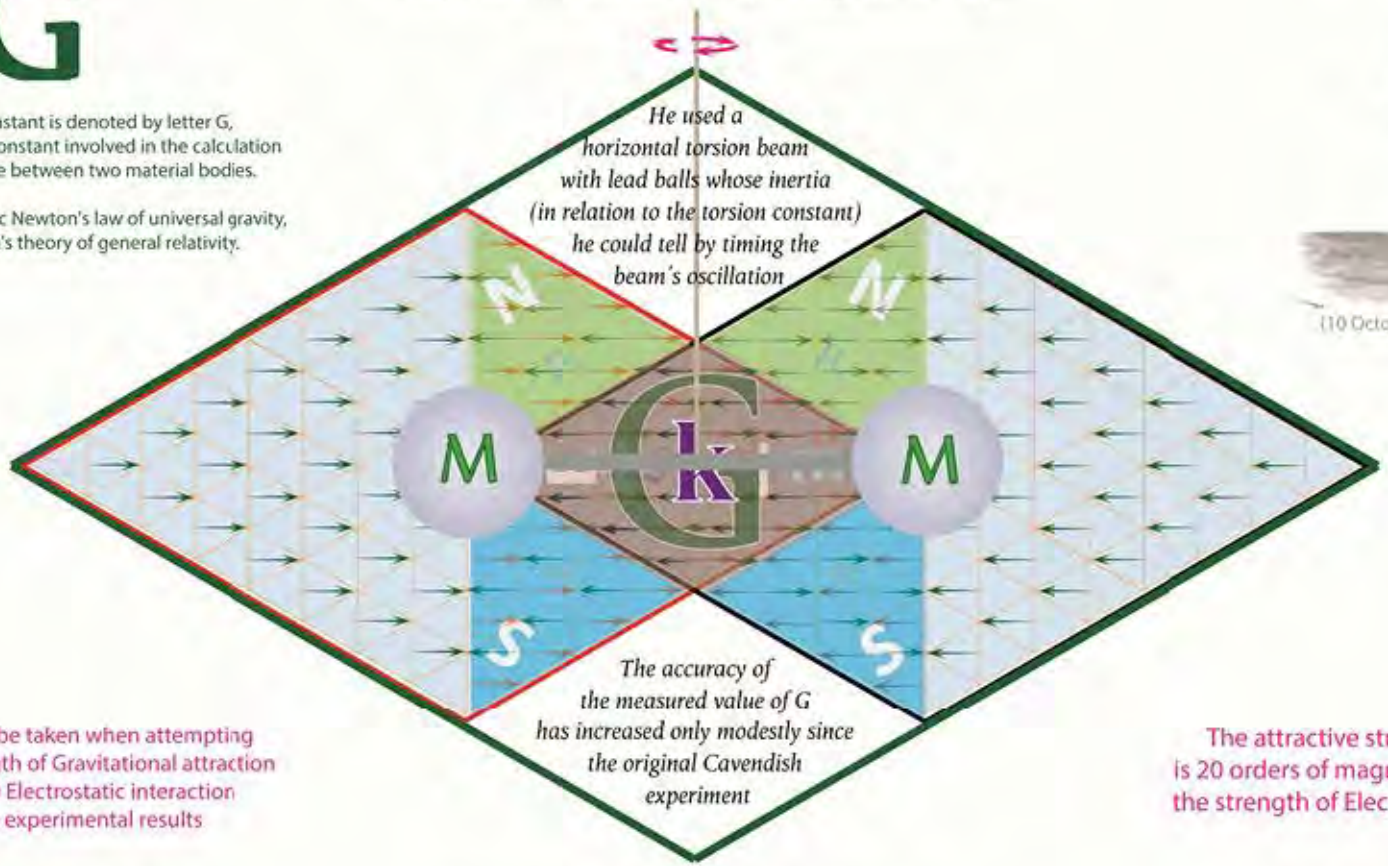
The Gravitational Constant

The gravitational constant is a difficult physical constant to measure to high accuracy, in fact it was not measured until over seventy years after Newton's death by Henry Cavendish with his torsion beam experiment, performed in 1798

G

The gravitational constant is denoted by letter G, it is an empirical physical constant involved in the calculation of the gravitational force between two material bodies.

It usually appears in Sir Isaac Newton's law of universal gravity, and in Albert Einstein's theory of general relativity.


He used a horizontal torsion beam with lead balls whose inertia (in relation to the torsion constant) he could tell by timing the beam's oscillation
N
N
M
G
K
M
S
S
The accuracy of the measured value of G has increased only modestly since the original Cavendish experiment

Extreme care must be taken when attempting to measure the strength of Gravitational attraction to ensure that NO Electrostatic interaction influences the experimental results

The attractive strength of Gravity is 20 orders of magnitude weaker than the strength of Electrostatic interaction

8.98755 e9 N

$$F = k \frac{Q_1 Q_2}{r^2}$$

It is also known as the universal gravitational constant, Newton's constant, and colloquially as Big G.

g

It should not be confused with "little g" (g), which is the local gravitational field (equivalent to the free-fall acceleration), especially that at the Earth's surface.

G

6.67384 e-11 N

$$F = -G \frac{M_1 m_2}{r^2}$$

Gravity has no established relation to other fundamental forces, so it does not appear possible to calculate it indirectly from other constants that can be measured more accurately, as is done in some other areas of physics

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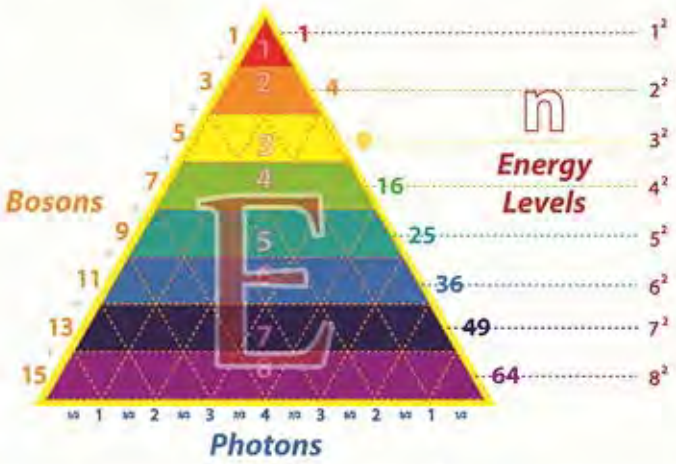
Fundamental field strengths

are the result of equilateral energy momenta geometries



Force	Approximate Relative Strength	Range
Strong Nuclear	10^{38}	10^{-15}
ElectroMagnetic	10^{36}	Infinite
Weak	10^{2}	10^{-18}
Gravitational	1	infinite

All the field strengths of the fundamental interactions are a direct result of the interactions of their Tetryonic mass-energy goemetries and Tetryonic Matter topologies

m E M

geometries density topologies

(whilst Gravity can be modelled as a weak convergent Coulombic attraction its actual physics are the result of vacuum energy displacement by Matter topologies)

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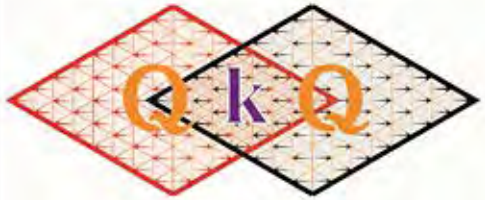
The Strength of the Gravitational Constant

Coulomb's Constant



[24-12]

Proton nett charge

1.60217646 e -19 C

equal (but opposite) nett Charges

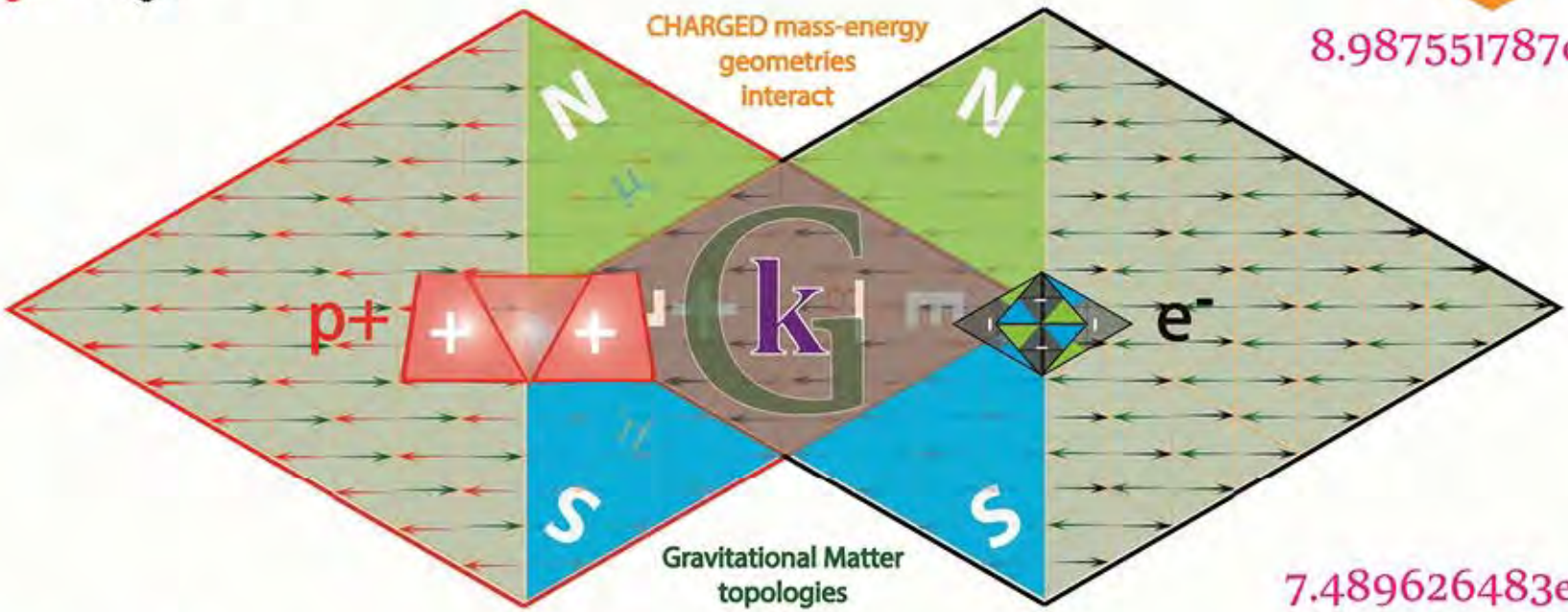
[0-12]

Electron nett charge

1.60217646 e -19 C

8.987551787e9 N

CHARGED mass-energy geometries interact



Gravitational Matter topologies attract

7.489626483e-11 N

Newton's Constant

1.659653693 e -27 KG

Proton rest mass-Matter

[1.5e23-7.5e22]

1875

8.851486361 e -31 KG

electron rest mass-Matter

[1.2e20]

Although it provides a coherent and accurate model of all the motive forces & interactions present the modelling of Gravity with EM fields does not account for the source, strength & unilateral direction of Gravitational fields

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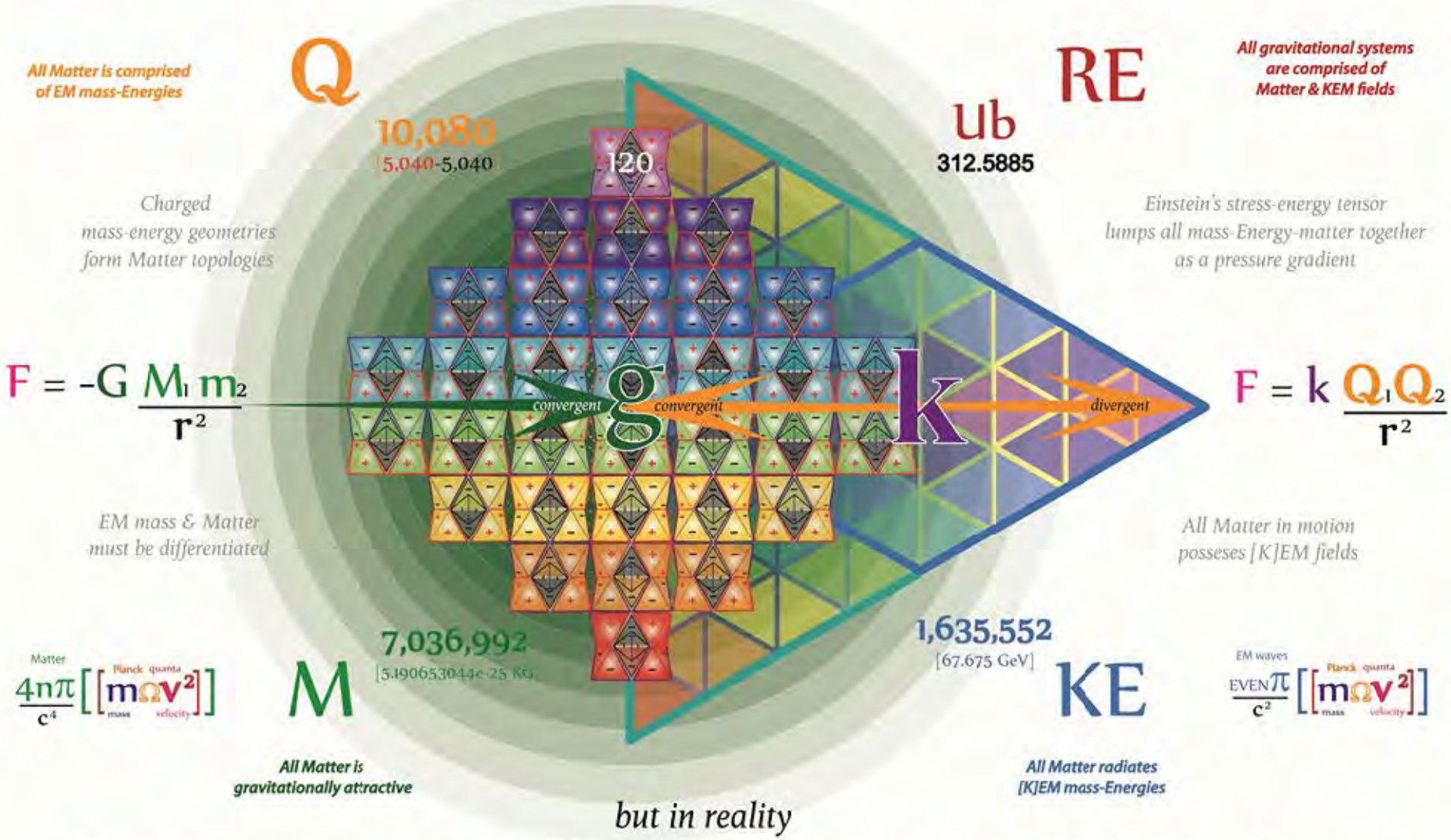
Tetryonic Matter interaction and Gravitation

Electrostatic convergence can serve as a model for Gravitational attraction



Gravitational attraction results from the displacement of vacuum energies by Matter topologies

[The effects of stronger [K]EM fields can be excluded from the long distance attractive [gravitational] motion of material bodies to each other]

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Modelling the force of Gravity

It is in many ways very similar to Coulomb's law of Interaction
between charged particles developed by Coulomb
(after Newton's Gravitation)

For many people, it is easiest to picture gravity as a kind of special invisible force, emanating from ALL the Matter in the universe. Newton's law of Gravity leads one to sees it this way and it is probably the view most of us were given when we learned about gravity in elementary school.

Gravity can be modelled as weak convergent EM field

However, there is another way to model Gravity's effects. It stems from Albert Einstein's General theory of Relativity, a theory that describes gravitation as being the result of the curvature of spacetime as a result of energy gradiant

Gravity can also be modelled as convergent pressure gradients

To understand what gravity really is you must have a clear understanding of the distinctions between radiant EM mass and standing-wave Matter and the various quantum interactions they produce.

Tetryonics provides a clear geometric definition and distinction between 2D radiant mass-energy geometries and 3D Matter topologies along with a new unified model of the mechanics of Universal Gravitation at all scales

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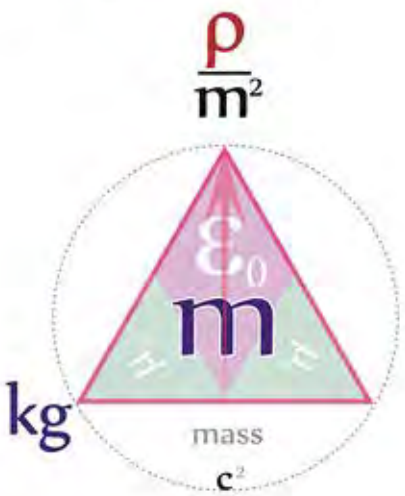
radiant mass-energy geometries



'Action-at-a-Distance'

mass-energies

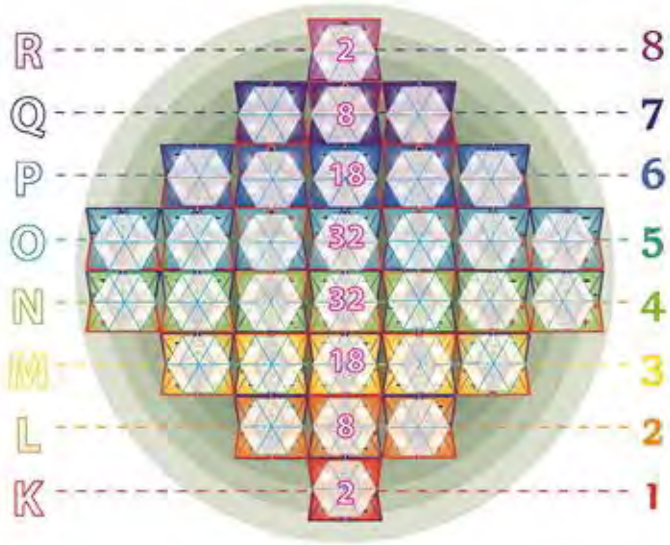
$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta; mass; velocity

[K]EM mass-Energies with QAM create interactive divergent [and convergent] charge geometries

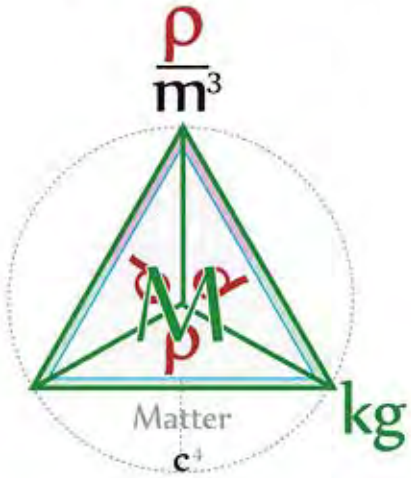
Newtonian Gravity

Toplogical mass is Matter



All Matter contains nullspaces and produces motional KEM fields

standing-wave Matter toplogies



'Folded Space-Time'

Matter

$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta; mass; velocity

Tetryonic Matter creates low pressure nullspace resulting in convergent Energy pressure gradients

General Relativity

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Instantaneous action-at-a-distance

Tetryonic QED theory shows that where the linear energy momentum of longitudinal waves align and act in a co-linear direction they can facilitate near instantanous action-at-a-distance

$$\sum \mathbf{F} = 0 \Rightarrow \frac{d\mathbf{v}}{dt} = 0$$

Free particles move with constant vector-velocity
(that is, with zero acceleration, unless acted upon by an outside force).

The Earth orbits the SUN where it is now about a common centre of gravity

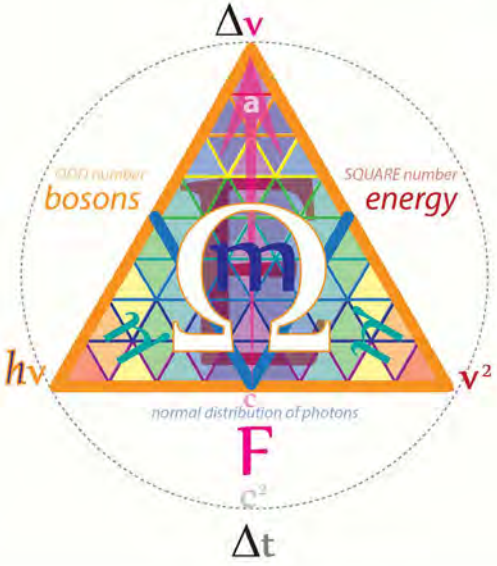
'Action-at-a-Distance' and 'Instantaneous' forces were introduced into Physics within Newton's notion of absolute space and time

If the SUN were to vanish the Earth would cease traveling in its current elipical orbit immediately

$$\sum \mathbf{F} = \frac{\mathrm{d}\mathbf{p}}{\mathrm{d}t} = m\frac{\mathrm{d}\mathbf{v}}{\mathrm{d}t} + \mathbf{v}\frac{\mathrm{d}m}{\mathrm{d}t}$$

The vector-force on a particle equals the product of its mass by its vector acceleration

$$\mathbf{F} = m\mathbf{a} = \frac{\Delta \mathbf{p}}{\Delta t} = \Delta\left[\frac{m\mathbf{v}}{t}\right]$$



The speed of gravity is limited to c

Einstein's GR theory replaces Newton's force of gravity and absolute space & time with a relativistic spacetime gradient curved by mass-energies

If the SUN were to vanish the Earth would continue traveling in its current orbit for $8^{1/3}$ minutes

The forces of action and reaction are equal and opposite;
(if a particle A exerts a force f on a particle B, then B exerts a force–f on A)

$$\sum \mathbf{F}_{a,b} = -\sum \mathbf{F}_{b,a}$$

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Newton's Gravitational Constant

$$F = -G \frac{M_1 m_2}{r^2}$$

According to Newton's law of universal gravitation,

the attractive force (F) between the centres of two bodies of mass-Matter, is proportional to the product of their Matter (M1 and m2), and inversely proportional to the square of the distance (r) between them

Long distance force

spacetime curvature

Newton's Gravitional Force models a motive force for gravitational acceleration

Einstein's General relativity has no motive force for gravitational accelerations

6.67384 e-11

$$\left[\frac{N m}{kg}\right].\left[\frac{N m}{kg}\right]$$

The gravitational force between two interacting bodies of Matter is

$$\left[\frac{N m^2}{kg^2}\right] = \left[kg \frac{m}{s^2} \frac{m^2}{kg^2}\right] = \left[\frac{m^3}{kg\, s^2}\right]$$

$4\pi G\rho$

$8\pi G\rho$

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Action-at-a-Distance

All Matter creates KEM fields of energy momenta

radiant mass-energies INTERACT

All Matter creates a displacement of vacuum energies

standing-wave Matter ATTRACTS

Once established longitudinal EM fields between Matter form an 'inelastic rod' of energy momenta that can facilitate an instantaneous 'Action-at-a-Distance'

Energy momenta propagates at 'c' - ACTION moves instantaneously along established lines of longitudinal Electric Force
M
linear momentum impulse
E
linear momentum impulse
M
Any field of longitudinal energy momenta between Matter can facilitate instantaneous interactions
including radiant EM fields and vacuum energies

Gravity is known as a Universal force of attraction between two objects that is proportional to their mass-Matter content

Newton's theory of gravity offered no prospect of identifying any mediator of gravitational interaction. His theory assumed that gravity acts instantaneously, regardless of distance.

Energy momenta creates universal motive forces

According to Albert Einstein's theory of special relativity, instantaneous action-at-a-distance was seen to violate the relativistic upper limit on speed of propagation of information.

If one of the interacting objects were to suddenly be displaced from its position, the other object would feel its influence instantaneously, meaning information had somehow been transmitted faster than the speed of light.

Gravity fields create a universal attractive field

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Gravitational Constant

The gravitational constant denoted by letter G, is an empirical physical constant involved in the calculation(s) of gravitational force between two bodies.
It appears in Sir Isaac Newton's law of universal gravitation, and in Albert Einstein's theory of general relativity.
It is also known as the universal gravitational constant, Newton's constant, and colloquially as Big G.

It should not be confused with "little g", which is the local gravitational field (equivalent to the free-fall acceleration), at the Earth's surface

Gravitational Forces can be modelled

$6.67\ e\text{-}11\ \left[\frac{Nm}{kg}\right]^2$

linear Newton metres

$6.67\ e\text{-}11\ \left[\frac{E}{kg}\right]^2$

scalar Energy momentum

as the geometric MEAN of superpositioned fields of gravitational energy

$$F = -G\frac{M_1 m_2}{r^2}$$

The gravitational force between
two neutral interacting bodies is

N.m = Joules

$\left[\frac{Nm}{kg}\right].\left[\frac{Nm}{kg}\right]$

$[N.m/kg]^2 \sim [E/kg]^2$

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Gravitational acceleration

Gravitational acceleration can be viewed as a reflection of the change in an object's momentum over time

$$\sum \mathbf{F} = \frac{d\mathbf{p}}{dt} = m\frac{d\mathbf{v}}{dt} + \mathbf{v}\frac{dm}{dt}$$

$$\frac{\left[\frac{m}{s}\right]}{s}$$

$$\vec{g} = \frac{\vec{F}_g}{m} = -G\frac{mM}{mr^2}\hat{r} = -\frac{GM}{r^2}\hat{r}$$

expressed vectorially the force is always ATTRACTIVE to the larger masss and acts in opposition to the KEM field's divergent momenta

F=ma

kg

G

g

force

The force on a body acted upon by a Gravitational field is given by

$$g = G\frac{m}{r^2}$$

The greater the mass of a gravitating object the greater the acceleration due to the mass

The closer a body is to a the source of a Gravitational field the greater the acceleration due to the field

$$\left[\frac{N}{kg}\right] = \left[\frac{m}{s^2}\right] = \frac{\left[kg\,\frac{m}{s^2}\right]}{kg}$$

gravitational acceleration can be modelled as the convergent vector component of superpositioned EM fields

$$\left[\frac{Nm}{kg}\right]^2$$

The gravitational force between TWO neutral interacting bodies is

$$\left[\frac{Nm}{kg}\right].\left[\frac{Nm}{kg}\right]$$

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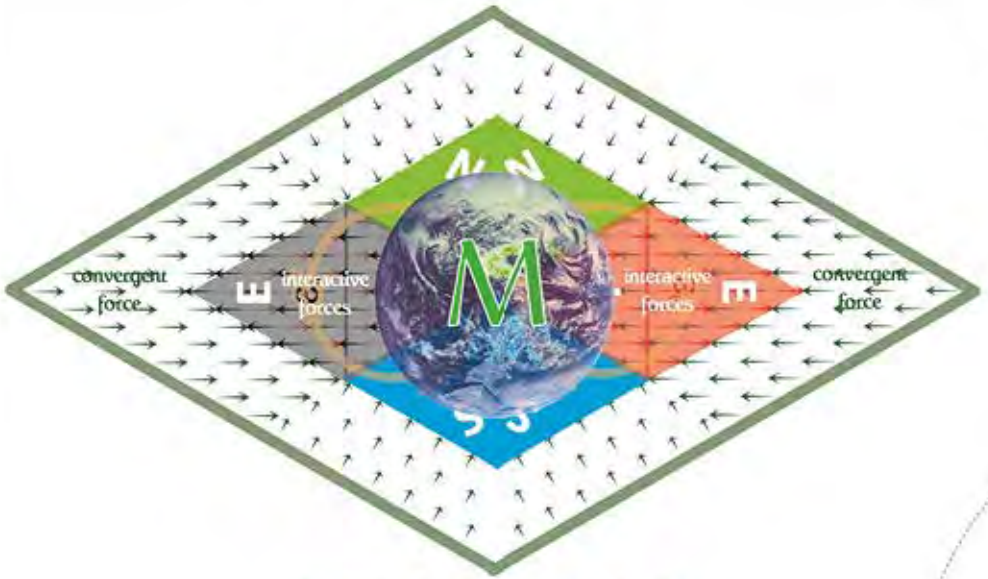
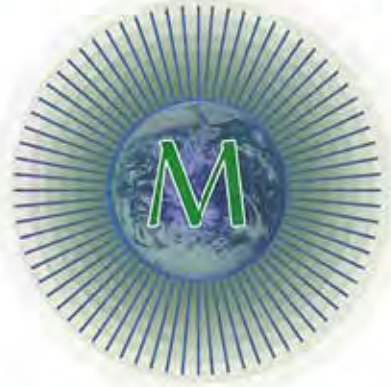
Modelling Gravitational fields



The [K]EM fields of planetary bodies are the result of their mass-Matter density and motion in space

Gravity can be modelled as weak convergent force created by and acting between the mass-Matter in planetary bodies



Matter topologies displace vacuum energies creating Gravity

Weak KEM fields can accurately model Gravitational fields

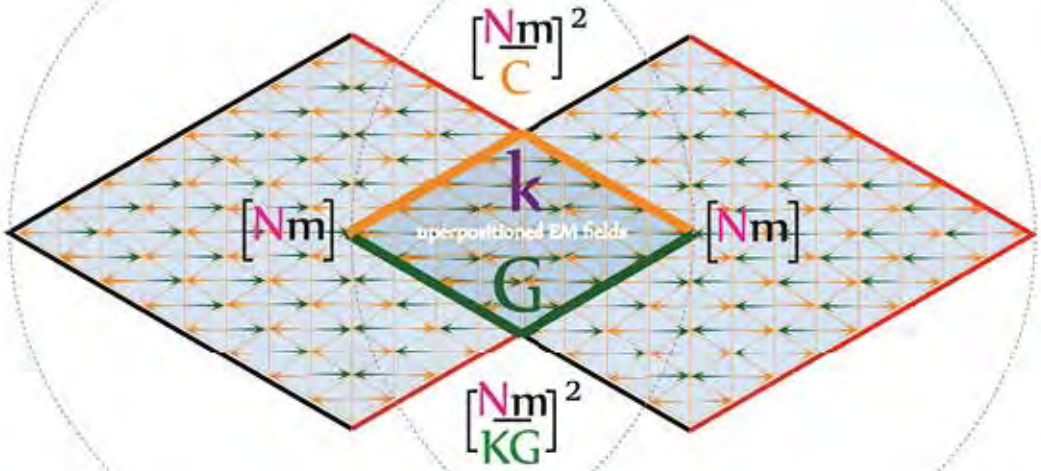
Gravitational fields are the result of the displacement of vacuum energies by Matter topologies and the interactive energy momenta of their radiant KEM fields

$$F = k\frac{Q_1 Q_2}{r^2}$$

interactive forces

8.98755 e9

The electinteractive orce created by two superpositioned KEM fields



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The gravitational force between two neutral interacting bodies

attractive force

$$F = -G\frac{M_1 M_2}{r^2}$$

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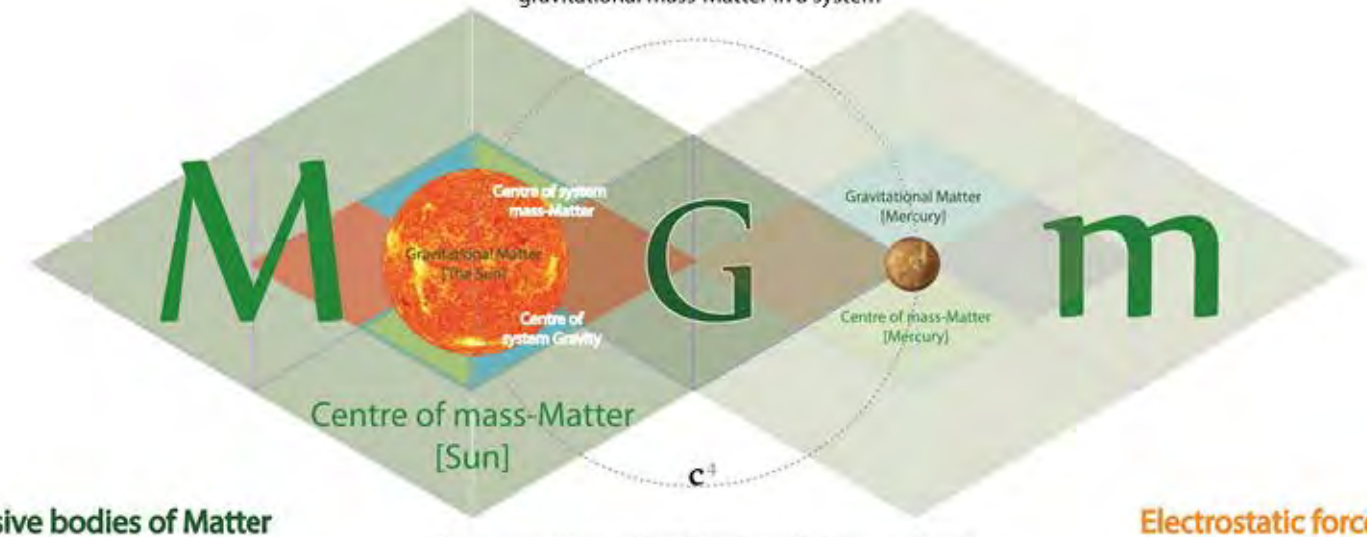
Centres of Gravity

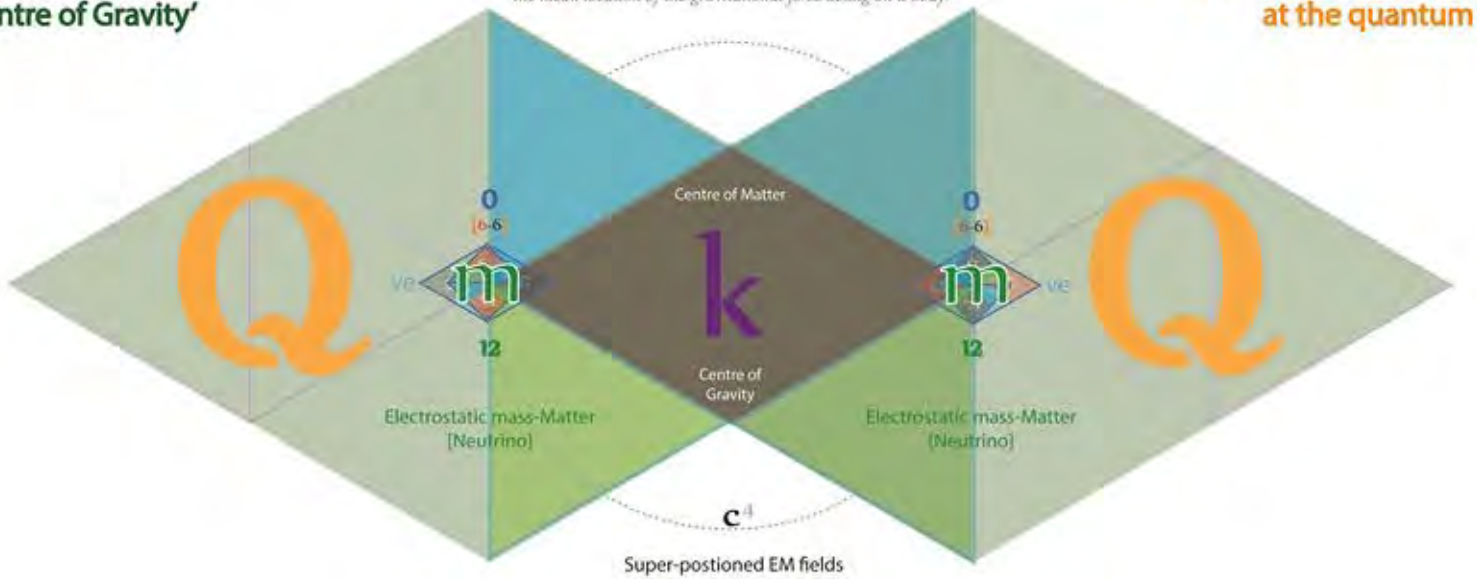
are determined by
the distribution of the combined
gravitational mass-Matter in a system



Any two massive bodies of Matter (be they Stars or Neutrinos) will orbit about their 'Centre of Gravity'

The term center of mass is often used interchangeably with center of gravity, but they are physically different concepts. They happen to coincide in a uniform gravitational field, but where gravity is not uniform, center of gravity refers to the mean location of the gravitational force acting on a body.

Electrostatic forces are many orders of magnitude greater than gravity & dominate nuclear interactions at the quantum scale



Super-postioned EM fields
have c^4 geometries $[c^2 \times c^2]$

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$F=ma$

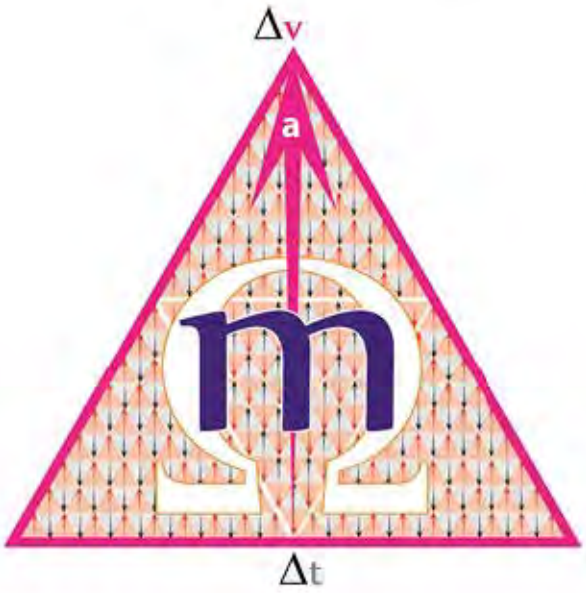
There are two quite distinct types of mass in Newton's theory of mechanics and gravitation.

(i) inertial mass, which occurs as the ratio between force and acceleration in Newton's second law and thus measures a particle's resistance to acceleration, and

(ii) Gravitational mass, which may be regarded as the gravitational analog of electric charge, and which occurs in Newton's Gravitational equation

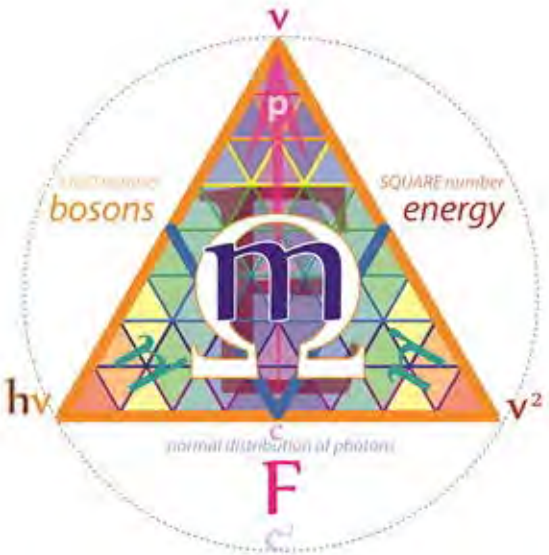
$$F_g = -G\frac{m_1}{r^2}$$

Inertial mass
is a measure of the total
energy momenta geometries
of Matter topologies



Inertial mass

results from constituent quanta
acting against (or with) any
Force applied to a mass



Often stated as the 'Principle of Equivalence'
on which General relativity is founded ,
it can be summarised as follows:

$$a = \frac{m}{m} g$$

"Inertial mass and Gravitational mass are equivalent"

whilst mass-energies contribute equally to inertial & gravitational mass it is Matter topologies that creates Gravity

All Gravitational Matter
has EM mass geometries in
its Matter topology

'Gravitational' mass

is seen as being the constituent quanta
of opposite charge polarity
attracting another particle's quanta

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Discerning between the competing laws of Gravity

$M + KE = RE$

gravitational mass-Matter — *fields of force* — *relativisitic mass-energy densities*

At the heart of resolving the true nature of Gravity is the formal definitions of mass-Energy-Matter and the interplay between the various field interactions they produce and possess

$$F = -G\frac{M_1 m_2}{r^2}$$

Newton taught that masses attract each other with a force inversly proportional to the distance between the masses.

Newton's idea was that planets are held in their orbits around the Sun by a force proprtional to the mass of the Sun and the planets, and that force is always pointing inwards (i.e. planets get pulled in the direction of the Sun, and the Sun gets pulled in the directions of the planets).

Newton said that a person standing on the Earth is being held to the Earth by a force due to the mass of the Earth and the mass of the person, and that force is always pointing inwards (i.e. a person gets pulled in the direction toward the center of the Earth, and the Earth gets pulled in the direction of that person).

Newton's and Einstein's view of gravity differ markedly

Einstein, on the other hand, taught that all things with mass (including the Sun, Earth, and the rest of the planets) create a energy density gradient that causes spacetime to curve and that this curvature is an alteration the geometry of spacetime.

The curvature casues Matter to move toward the center of the largest nearby mass. The closer to this mass the larger the degree of curvature in the local spacetime.

Additionally, Einstein taught that if there are no external forces acting upon an object (even those without any mass such as photons) then that object will simply follow its natural path (geodesic) through the altered geometry of the local spacetime - regardless of the degree of curvature of that local spacetime. This implies that if an object is somehow kept from following its natural path (geodesic) then a net force does exist and is measurable on that object.

Newton's view of gravity

Sir Isaac Newton described gravity as a force that attracts things possessing Matter

Sir Issac Newton

(25 December 1642 – 20 March 1727)

Gravity is an instantaneous 'Action-at-a-Distance' mediated by a means unknown

Einstein's view of gravity

Albert Einstein described gravity as a 3D curvature of spacetime caused by Matter

Albert Einstein

(14 March 1879 – 18 April 1955)

Matter and energy tell spacetime how to curve. Spacetime tells matter how to move

Ricci curvature — *scalar curvature* — *Gravitational constant*

$$R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

spatial geometry — *stress-energy tensor*

There is no doubt that both Sir Isaac Newton & Albert Einstein were both brilliant, their theories describing Universal Gravitation have remained at the fore for hundreds of years now.

However, a more accurate model of the Universal Gravitation is now at hand and its true nature is revealed via the Tetryonic geometry of EM mass-Energy-Matter and its associated field interactions. Tetryonic Gravitation demonstrates the validity of both approaches and reveals the true geometry behind the field interplays that result in the familiar force of Gravity

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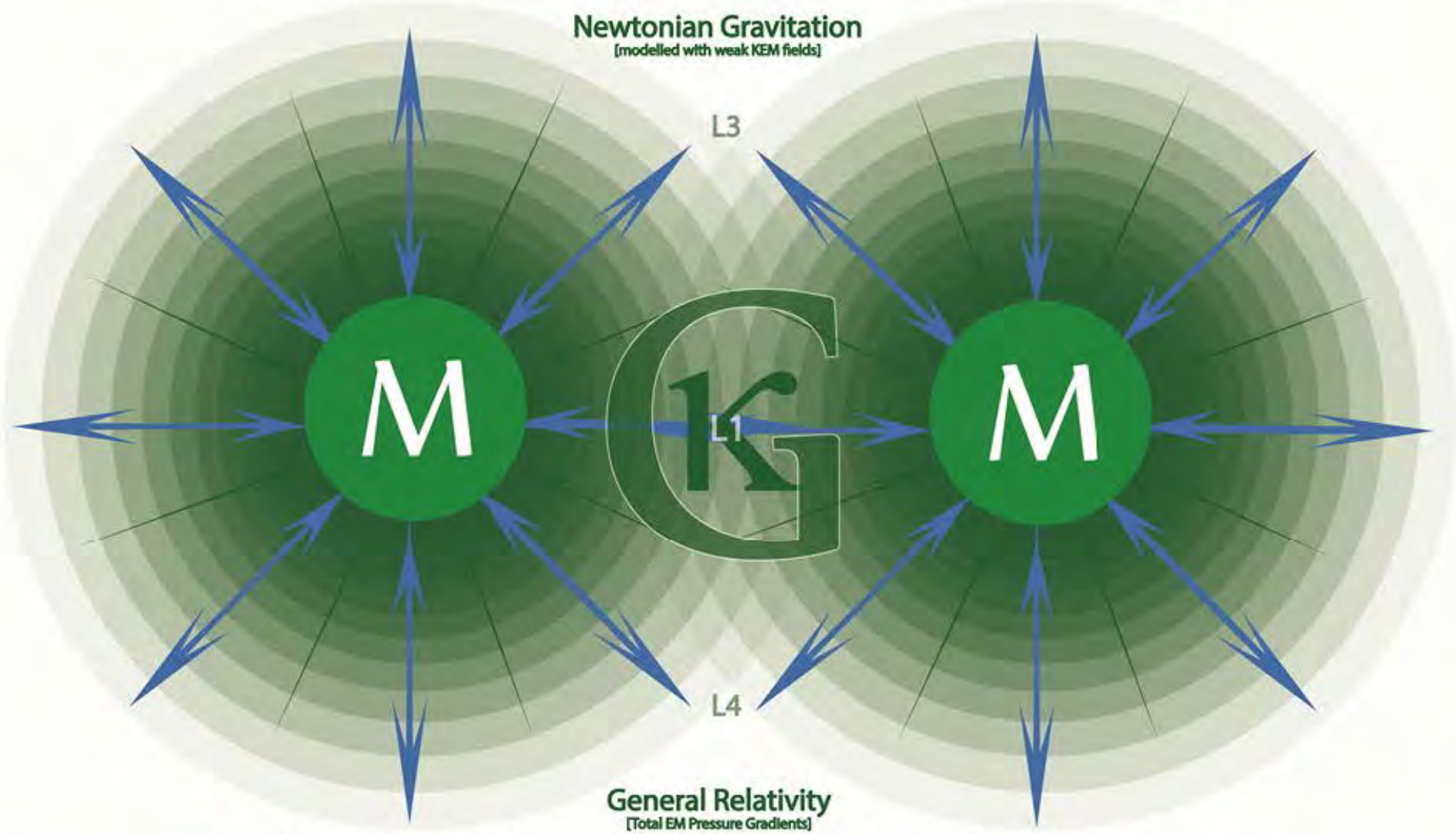
The two models of Gravitation

Newtonian gravitation models the observed large-scale convergent force between all material bodies



General Relativity models the convergent pressure gradiant created by all forms of energy

While both models are very successful they both fail to reveal the quantum-scale geometries and topologies that give rise to universal gravitation

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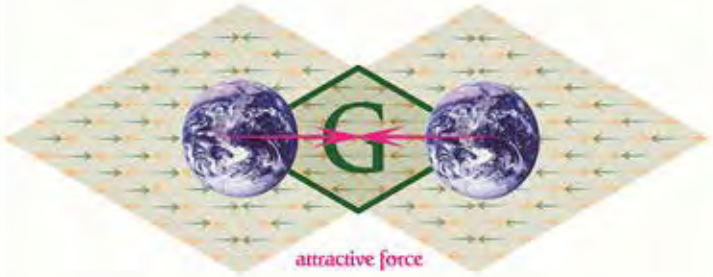
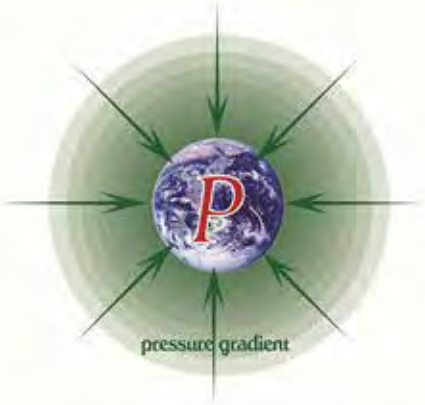
Theories of gravitation



Newton viewed Gravitation as an attractive FORCE of Matter
(inverse square field strength)

for the mechanics of gravitation
"I feign no Hypothesis"

"Gravity is the result of curved spacetime"



Einstein viewed it as the curvature of 4D spacetime
(PRESSURE gradient)

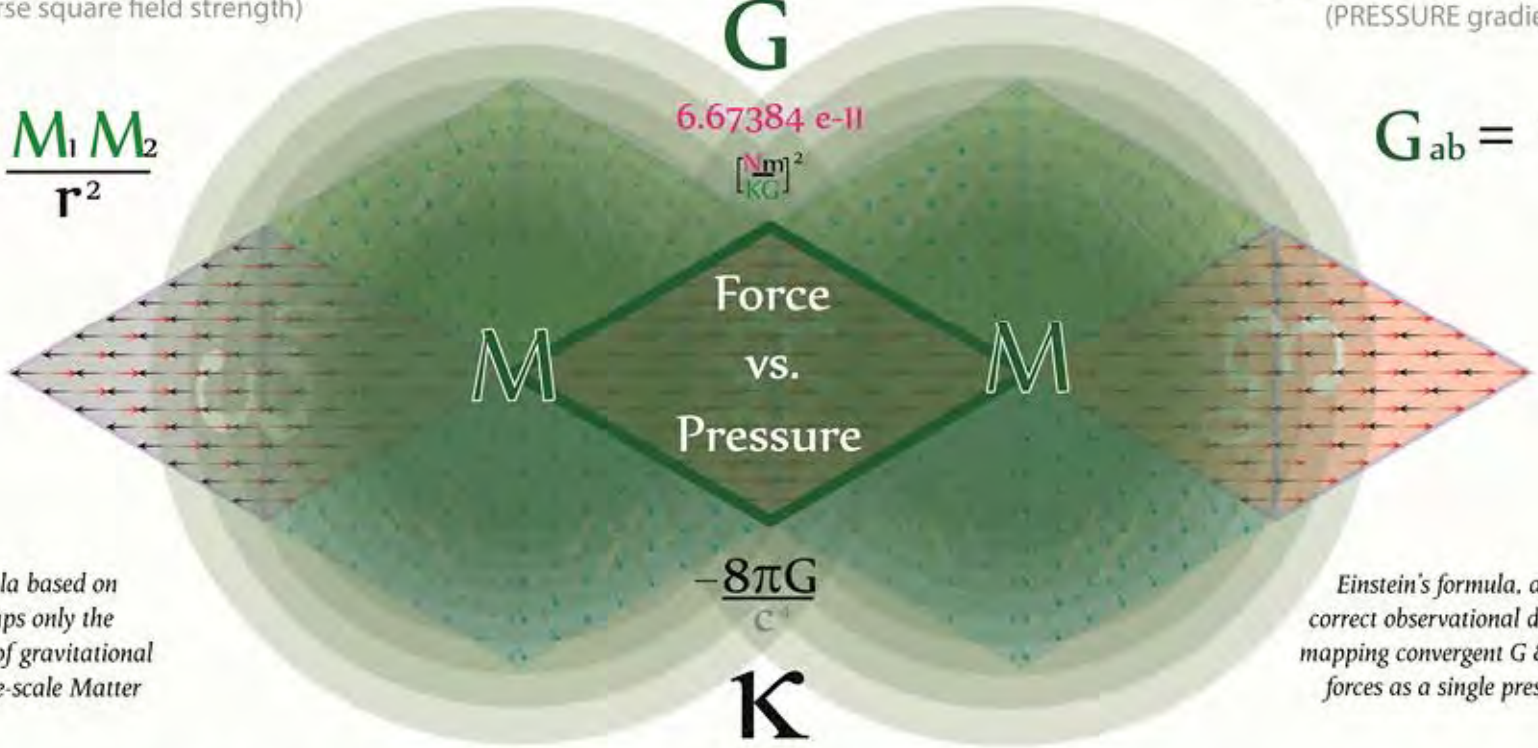
$$F = -G\frac{M_1 M_2}{r^2}$$

$$G$$

$$6.67384\ e\text{-}11$$

$$\left[\frac{Nm^2}{KG}\right]$$

$$G_{ab} = \kappa T_{\mu\nu}$$



$$-\frac{8\pi G}{c^4}$$

$$\kappa$$

Newton's formula based on observations maps only the observed nett force of gravitational attraction on large-scale Matter

Einstein's formula, attempted to correct observational discrepancies by mapping convergent G & divergent EM forces as a single pressure gradient

Both Newton and Einstein failed to define and distingush between mass-energy geometries & Matter topologies

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Newton's G vs Einstein GR

Both Newton and Einstein developed their gravitational models from the observed motions of celestial bodies without any distinction between mass and Matter or the quantum forces at work

Φ | $g_{\mu\nu}$

Gravitational Matter

Newton maps Matter's gravitational attraction [excluding any perturbations caused by [K]EM fields]

All mass-energies

Einstein's GR maps Newton's G & SR effects [mass-energy momenta [K]EM interactions]

Increasing accuracy in the measurements of the motions of spacecraft interacting with planetary bodies [using EM waves] has resulted in the need for refinement of both theories

F | $\Gamma^{\sigma}_{\mu\nu}$

$\nabla^2\Phi$ | $R_{\mu\nu}$

Einstein's doubling of Newton's gravitational constant was done to fit later observed perturbations in Mercury's orbital mechanics

Newtonian G field

Any valid tests of the purely gravitational fields of Matter must exclude KEM fields and not use EM masses to test it

ρ | $T_{\mu\nu}$

$$[\text{Newton}] = \frac{4\pi GMm}{r^2}$$

$$\nabla^2\Phi = 4\pi G\rho$$

Poisson

$$[\text{Einstein}] = \frac{8\pi GT_{\mu\nu}}{c^4}$$

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Pressure gradients and GR

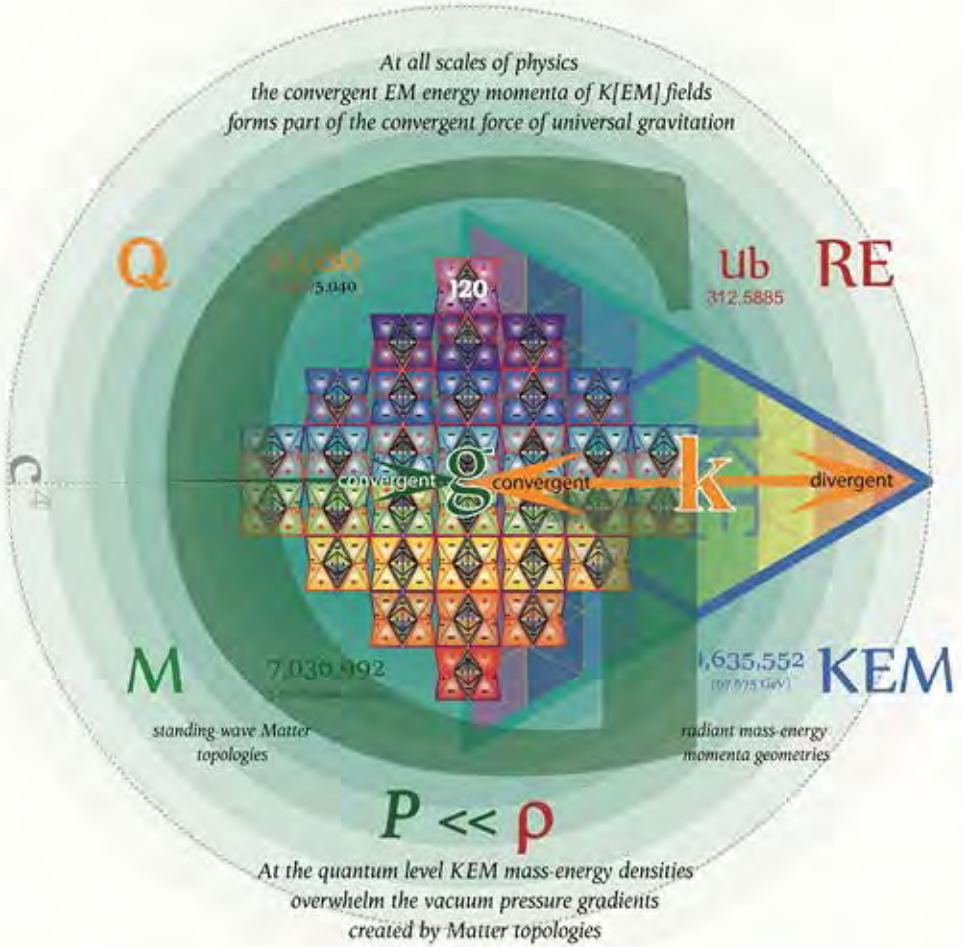
Tensor mathematics is utilised in General relativity to model mass-energy geometries and energy pressure gradients as curved spacetime

$$F = -G\frac{M_1}{r^2}$$

Newton's Gravitational fields are modelled on the observed motions of large-scale Matter attraction

$$G_{ab} = \kappa T_{\mu\nu}$$

Einstein's GR gradients corrects Newtonian gravity by modelling all forms of EM mass-Energy momenta



Newtonian G field

4π

Einstein's G field

8π

G

κ

Vector Force between Matter

$$n\pi\rho = n\pi\,[[m\Omega v^2]] = T_{\mu\nu}$$

Planck quanta; mass; velocity

representive of ALL the mass-energy momenta of any spatial volume

Pressure gradient per unit Volume

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Stress energy-pressure gradiants

are the result of Tetryonic charge geometries & topologies

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

mass · Planck quanta · mass · velocity

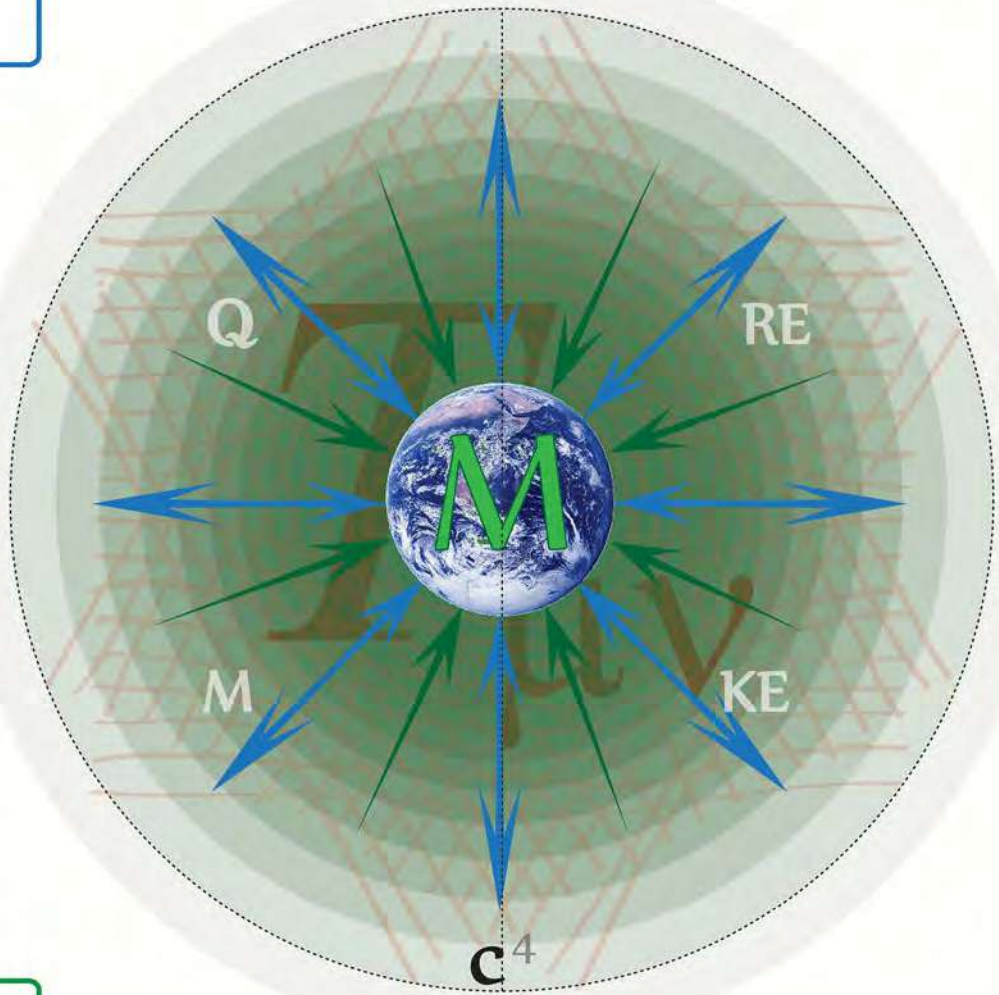
Radiant mass-energies have planar energy geometries

$n\pi$	Energy quanta
EVENπ	photons
ODDπ	bosons
4π	tetryons
12π	quarks
12π	leptons
24π	mesons
36π	Baryons

All Matter topologies are tetrahedral standing-wave mass-energy geometries

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Matter · Planck quanta · mass · velocity

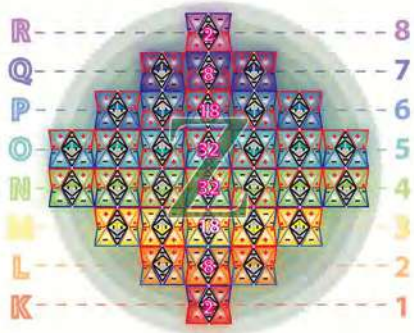


On the non-quantum scale all Matter topologies can be generalised and mathematically modelled as SPHERICAL 4π mass-energy topologies

radiated [K]EM fields have interactive energy momenta [convergent & divergent]

fields of Force

KEM



M

standing-wave topologies

displace vacuum energies creating convergent Gravity

relativistic mass-energies — standing-wave Matter — radiant mass-energies

RE = **M** + **KEM**

stress energies — topologies — geometries

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Stress Energy tensor

In the Einstein field equations [EFE] of general relativity, the stress-energy tensor is the source of gravitational mass just as Matter is the source of such a field in Newtonian gravity

$T_{\mu\nu}$

In Einstein's general relativity, the symmetric stress-energy tensor acts as the source of spacetime curvature

mass *ENERGY* *Matter*

m E M

geometries *momenta* *topologies*

Matter

$$\frac{4n\pi}{c^4}\left[\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v^2}\right]\right]$$

Planck quanta

The Tetryonic unified field equation models all mass-ENERGY geometries & Matter topologies

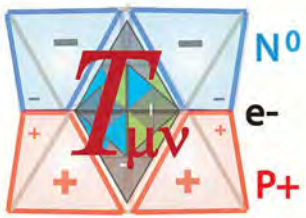
R_{ab}

c^4

A recognised problem in General Relativity is that the stress tensor models all forms of mass-energy-Matter in the form of a generalised stress energy pressure gradient but fails to differentiate between either mass or Matter and their resulting interactions within the fields

84

[42-42]



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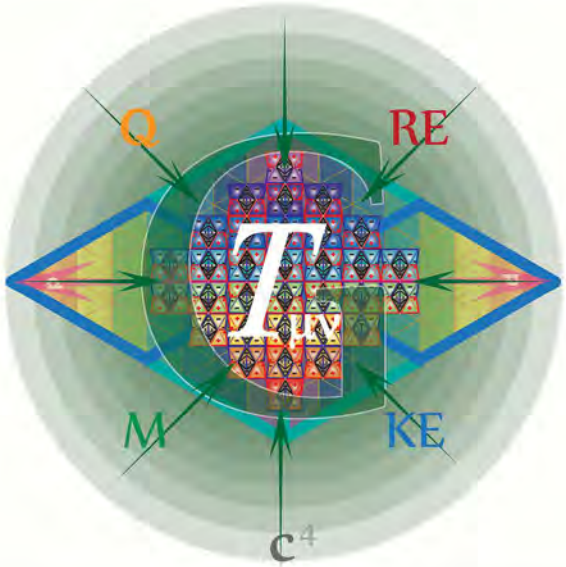

Planck quanta

$$n\pi\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v^2}\right]$$

radiant mass-energies create interactive fields of force

$T\pi[\rho]$

standing-wave Matter creates vacuum energy pressure gradients

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Gravimetric topologies

Charges create radiant mass-energy geometries & standing-wave Matter topologies

kg

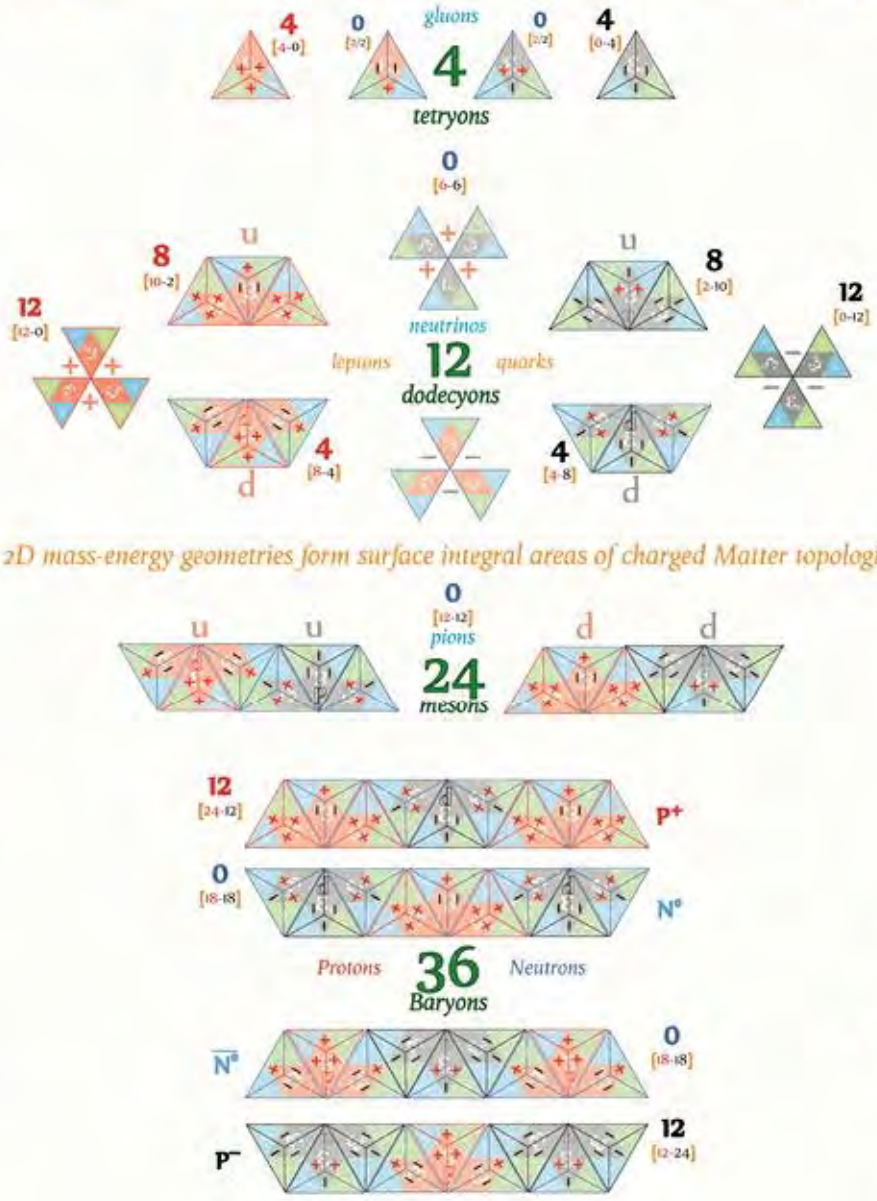
2D mass geometries

EM mass is not Matter

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$ mass; Planck quanta; mass; velocity

Charged energy geometries are the basis for 2D mass

Photons have mass-energy momenta geometries but no Matter topology

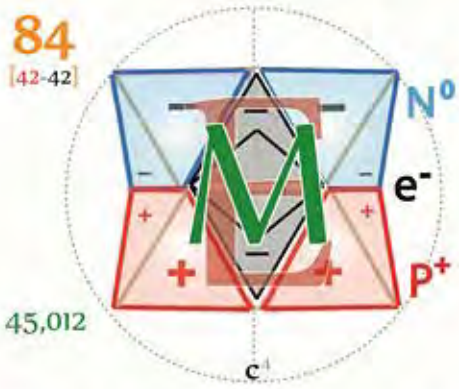


KG

3D Matter topologies

Matter has mass energies

Matter $$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$ Planck quanta; mass; velocity



Charged mass-energy topologies are the basis for 3D Matter

Its topology forms a quantum Faraday cage [with a charged surface integral of mass-energies]

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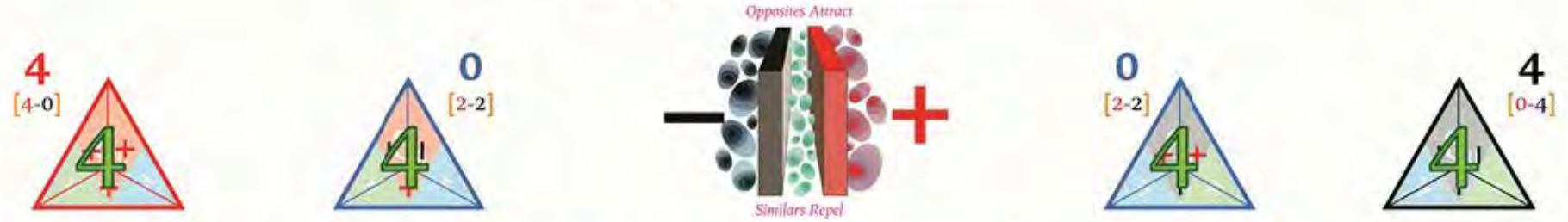
Interactive mass-energies vs. gravitational Matter

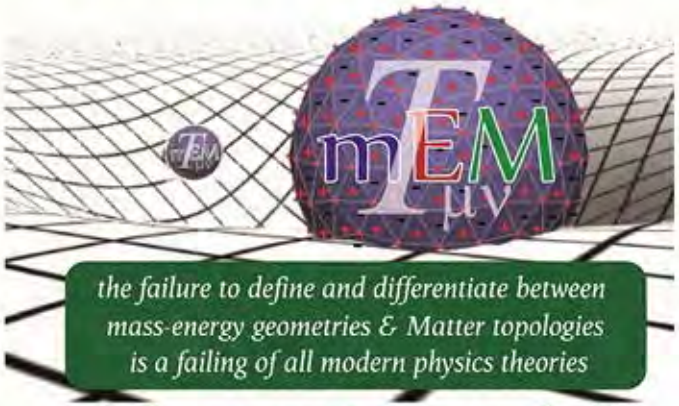
energy in all its forms seeks equilibrium



radiant mass-energy geometries

$$\frac{n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

mass · Planck quanta · mass · velocity



the failure to define and differentiate between mass-energy geometries & Matter topologies is a failing of all modern physics theories

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

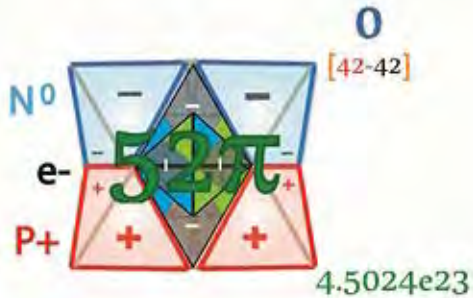
Matter · Planck quanta · mass · velocity

standing-wave Matter topologies

Charged Planck quanta of mass-energy momenta that form topologies displace the vacuum energies surrounding them in turn creating a mass-energy-Matter pressure gradient

Compton frequency of rest Matter is what creates inertial mass, its Gravitational Matter results from its charged topology

The integral inductive EM mass-energy momenta in Matter fascia create the physical property of inertial mass



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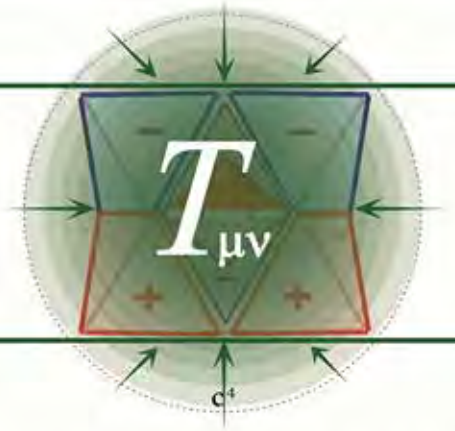
$$F_z = \Delta P . \Delta A$$

Pressure is the force per unit area
applied in a direction perpendicular to the surface of an object



The theory of general relativity uses a stress-energy tensor to reflect to the pressure differentials created by Energy in ALL its forms (making no distinction between EM masses & Matter)

In Tetryonics the stress energy tensor is expanded, through geometric terms, to diferentiate between radiant mass-energy interactions and Matter topologies in radial spatial co-ordinate systems defined by the speed of light

Radiant EM masses

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$ mass; Planck quanta; mass; velocity

Photons are often referred to as 'massless particles' are better defined as Matterless EM mass-energy momenta

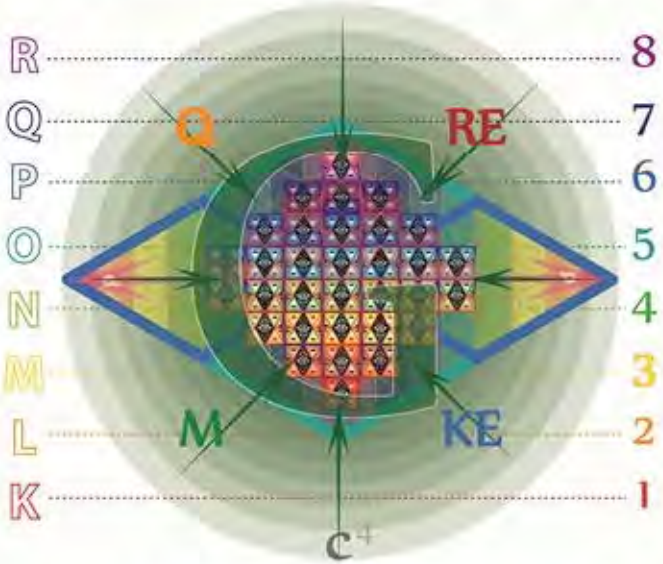
Photons

$$\frac{2\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$ Planck quanta; mass; velocity

interactive mass-energy momenta geometries

Energy Pressure gradients

The vacuum energy pressure gradient created by the charged topology of Matter is distinct from its intrinsic & radiative mass-energy geometries



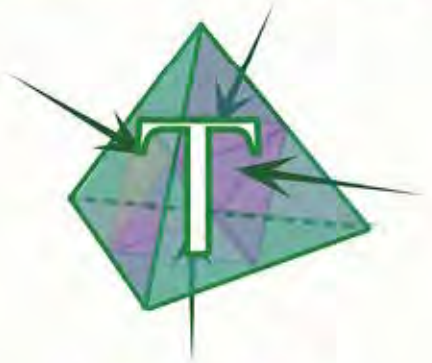
Any theory of gravitation that attempts to model it on any scale must account for energy in all its forms

Standing-wave Matter

Matter

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$ Planck quanta; mass; velocity

Tetryons, the quantum building blocks of Matter have EM mass-energy topologies that create a vaccum pressure gradient



Tetryons

$$\frac{4\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$ Planck quanta; mass; velocity

gravitational Matter topologies

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Convergent mass-energies & Gravitational Matter

m

Spacetime curvature

$$R_{\mu\nu} - \tfrac{1}{2}Rg_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

Stress-Energy Tensor

M

The concept of mass in general relativity (GR) is more complex than the concept of mass in special relativity. In fact, general relativity does not offer a single definition for the term mass, but offers several different definitions which are applicable under different circumstances.

Komar mass **Bondi mass** **ADM mass**

Under some circumstances, the mass or Matter components of a system may not even be defined

Einstein Field equation

Spacetime curvature

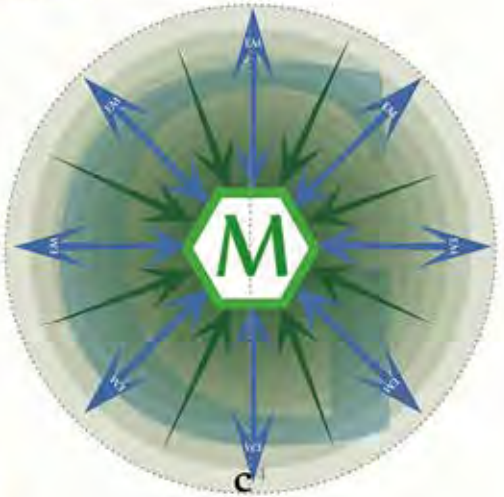
$$R_{\mu\nu} - \tfrac{1}{2}Rg_{\mu\nu} = \underbrace{\kappa}_{\text{gravitation constant}} \frac{n\pi}{c^4}\left[\left[\underbrace{m}_{\text{mass}}\Omega\underbrace{v^2}_{\text{velocity}}\right]\right]$$

total mass-energy-Matter

Planck quanta

per spatial volume

Tetryonic geometries & topologies



In contrast Tetryonic field equations explicitly differentiate all EM mass-energies and Matter via their charged geometries along with their contributions to the total energy density of any spatial region

GR models the convergent force of gravitation as a convergent energy density pressure gradient created by mass-energies

$$\underbrace{M}_{\text{gravitational mass-Matter}} + \underbrace{kEM}_{\text{interactive mass-energies}} = \underbrace{U}_{\text{stress energies}}$$

Tetryonics models gravitation as the result of mass-energy interactions AND Matter topology displacement of vacuum energies

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Faraday

$$\mathcal{E} = -\frac{d\Phi_B}{dt},$$

$$|\mathcal{E}| = N\left|\frac{d\Phi_B}{dt}\right|$$

Interactive EM force fields are subject to Lorentz velocity corrections

E & M

EM

$$\oint \vec{E}\cdot d\vec{s} = -\frac{d\Phi_B}{dt}$$

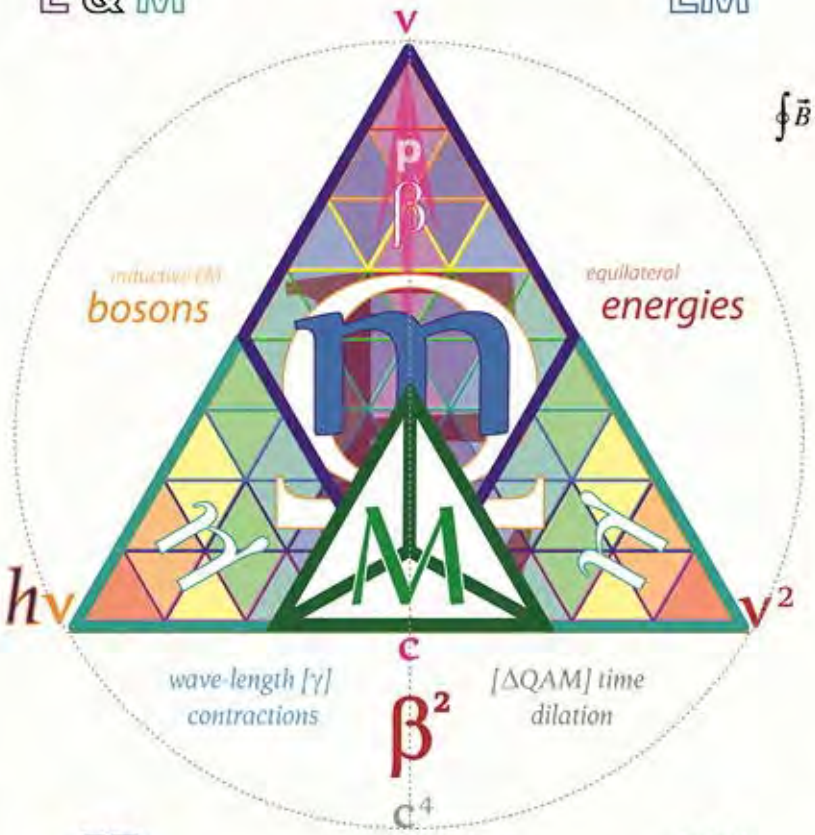
$$\oint \vec{E}\cdot d\vec{A} = \frac{q}{\varepsilon_0}$$

$$\oint \vec{B}\cdot d\vec{A} = 0$$

$$\oint \vec{B}\cdot d\vec{s} = \mu_0 i + \frac{1}{c^2}\frac{\partial}{\partial t}\int \vec{E}\cdot d\vec{A}$$

Maxwell

Special Relativity was developed from the foundation of Lorentz corrections to EM fields



General Relativity was developed from Special Relativity and incorporates EM field interactions

Lorentz

$$L = L'\sqrt{1-\frac{v^2}{c^2}}$$

$$t' = \frac{t}{\sqrt{1-\frac{v^2}{c^2}}}$$

Standing-wave Matter topologies are Lorentz invariant

$$G_{\mu\nu} = 8\pi G T_{\mu\nu}$$

$$E = \frac{mc^2}{\sqrt{1-\frac{v^2}{c^2}}}$$

Einstein

the failure to differentiate between mass & Matter has lead to major misconceptions in physics

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Tensor Rankings

Rank 0

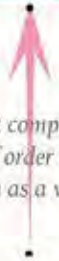
scalars

A tensor may consist of a single number, in which case it is referred to as a tensor of order zero, or simply a scalar

An example of a scalar would be the EM mass-energy of a particle or field

A second example of a scalar field would be the value of the gravitational potential energy as a function of position

Rank 1



The next most complicated tensor is the tensor of order one, otherwise known as a vector.

vectors

A vector can be defined as a direction between two points, its strength may vary continuously from point-to-point, thereby defining a vector field

Next above a vector are tensors of order 2, which are often referred to as matrices.

Rank 2

mass-energy momenta

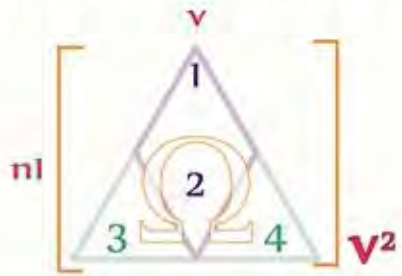
A tensor of rank 2 is defined as a system that has a magnitude and two associated vector directions within the fields that it describes

Rank 3

curved spacetime

Rank 4 Tensors as used in Einstein's General Theory of Relativity, describe the curvature of spacetime [the so-called Riemann curvature tensor].

Tetryonic Matrices



EM fields can be represented by Tetryonic Matrices [Tensors] identical to current square Tensor Matrices with the only difference being the change in the geometry of the matrix to better reflect the true geometry of EM fields

This better facilitates the easy recognition of Electric & Magnetic scalar fields and their associated energy-momenta vectors

Rank 4

mass-Matter topology

the total mass-energies of Matter & fields thatcontribute to creating gravity.

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ElectroMagnetic field tensor

The electromagnetic tensor or electromagnetic field tensor (sometimes called the field strength tensor, Faraday tensor or Maxwell bivector) is a mathematical object that describes the electromagnetic field of a physical system in Maxwell's theory of electromagnetism

$$2\pi\left[\frac{1}{c^2}\cdot[m\Omega v^2]\right]$$

Energy, momenta

Photons

$$\frac{2\pi}{c^2}\left[[m\Omega v^2]\right]$$

Planck quanta; mass, velocity

Visualising EM waves and photons In terms of their Tetryonic geometry the scalar relationships between Electric and Magnetic fields becomes readily apparent.

$$F^{\mu\nu} = -F^{\nu\mu}$$

photons are their own anti particles

A EM field tensor has six degrees of freedom, representing the three components of each of the electric and magnetic fields

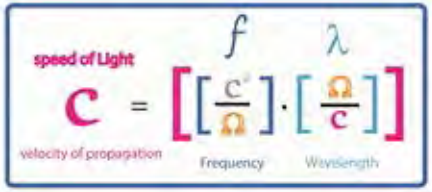
$$c = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$$

Speed of Light

EM wave factors such as Lorentz's velocity corrections arise naturally from the geometry providing a clear and concise illustration of the relationships between EM mass-energies, Charge, Electric & Magnetic fields and the speed of Light

Wavelength contraction

$$L = L'\sqrt{1 - \frac{v^2}{c^2}}$$



$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

Scalar correction factor

Linear correction factor

$$\beta = \left[\frac{v}{c}\right]$$

$$p = \frac{h}{\lambda} = \frac{E}{c}$$

Linear Momentum

$$\varepsilon_0\mu_0 = \frac{1}{c^2}$$

EM Fields

$$\frac{\partial \vec{B}}{\partial t} + \vec{\nabla}\times\vec{E} = 0$$

the change of the magnetic field with respect to time plus the curl of the electric field is equal to zero

$$\vec{\nabla}\times\vec{B} - \frac{1}{c^2}\frac{\partial \vec{E}}{\partial t} = \mu_0\vec{J}$$

The curl of the magnetic field vector minus the change of the electric field with respect to time, is equal to the field's current density

$$\det(F) = \frac{1}{c^2}\left(\vec{B}\cdot\vec{E}\right)^2$$

the electromagnetic tensor may also be written in terms of the 4-vector potential

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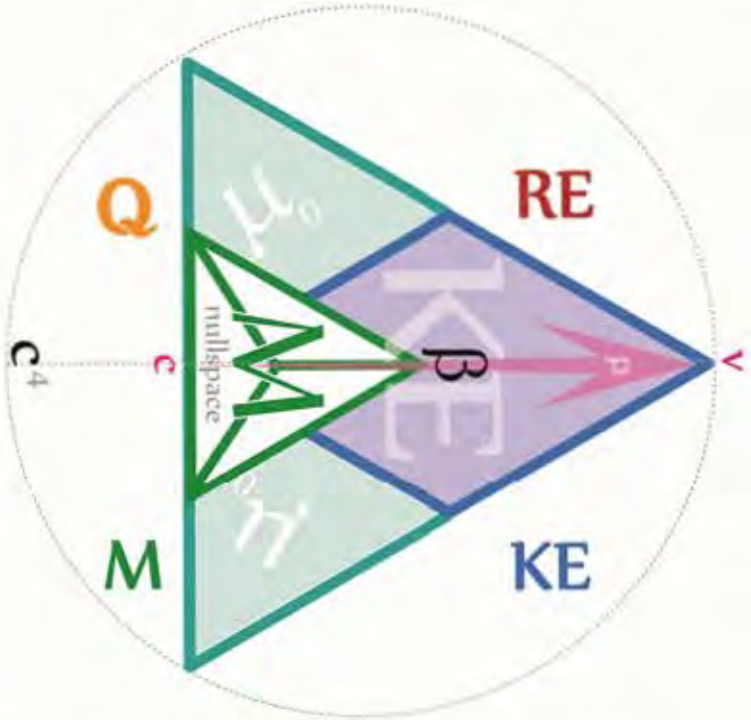
3D space time

$[\Delta x, \Delta y, \Delta z]$ $\Delta\tau$

In Tetryonics, the relativistic Four vector reflects the changing quantised angular momenta [time] of EM mass-energies & Matter in 3D space



$$M_0 + KE = E$$

Standing-wave four-vector | Lorentz corrected mass-energies | Stress energy momenta tensor

Relativistic Four-vectors

Charged Matter interacts at-a-distance through super-positioned energy momenta fields from which our force constants are derived

The electromagnetic four-potential is a potential from which electromagnetic field can be derived. It combines both the electric scalar potential and the magnetic vector potential into a single space-time four-vector

Inverse sqaured Gravity can be mathematically modeled using the same geometry explaining the similar formulations for charge interaction & gravitation

$$m^2v^4 = KE^2 = p^2v^2$$

EM mass | radiant energies | momenta

Four-vectors are reflective of the total EM mass-energy momenta of superpositioned [K]EM fields where the KE is the interactive force component

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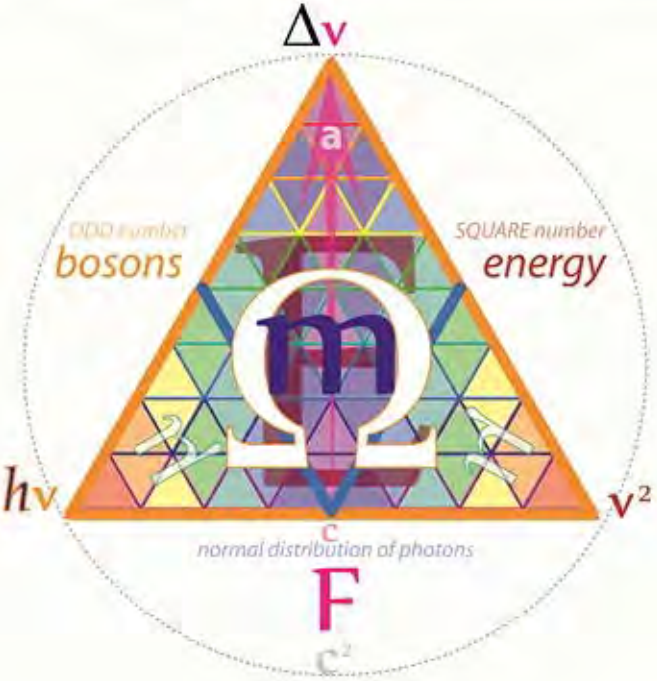
Special and General relativity

General relativity was developed by Einstein in an attempt to describe the acceleration forces experienced by graviational Matter (on the foundation of special relativity) which in turn was an extension of Lorentz corrections of EM waves developed to account for the fixed speed of light and established Newtonian mechanics

SR

Special Relativity

(describes inertial frames of reference in flat Euclidean spacetime)



GR

General Relativity

(describes accelerating frames of reference in curved Riemannian spacetime)

mass-energy

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}$$

geometries

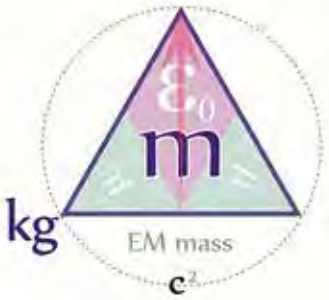
Matter

$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}$$

Matter

topologies

2D



all physical theories to date have failed to explain the mechanics of gravitation at all scales of energy and distance

$\frac{\rho}{m^2}$

6.629432351 e-34 J

ENERGY

$$n\pi\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}$$

7.376238376 e-51 kg

$\frac{\rho}{m^3}$

3D

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The Weak Equivalence Principle

$m_g .a = m_i .g$

Newton

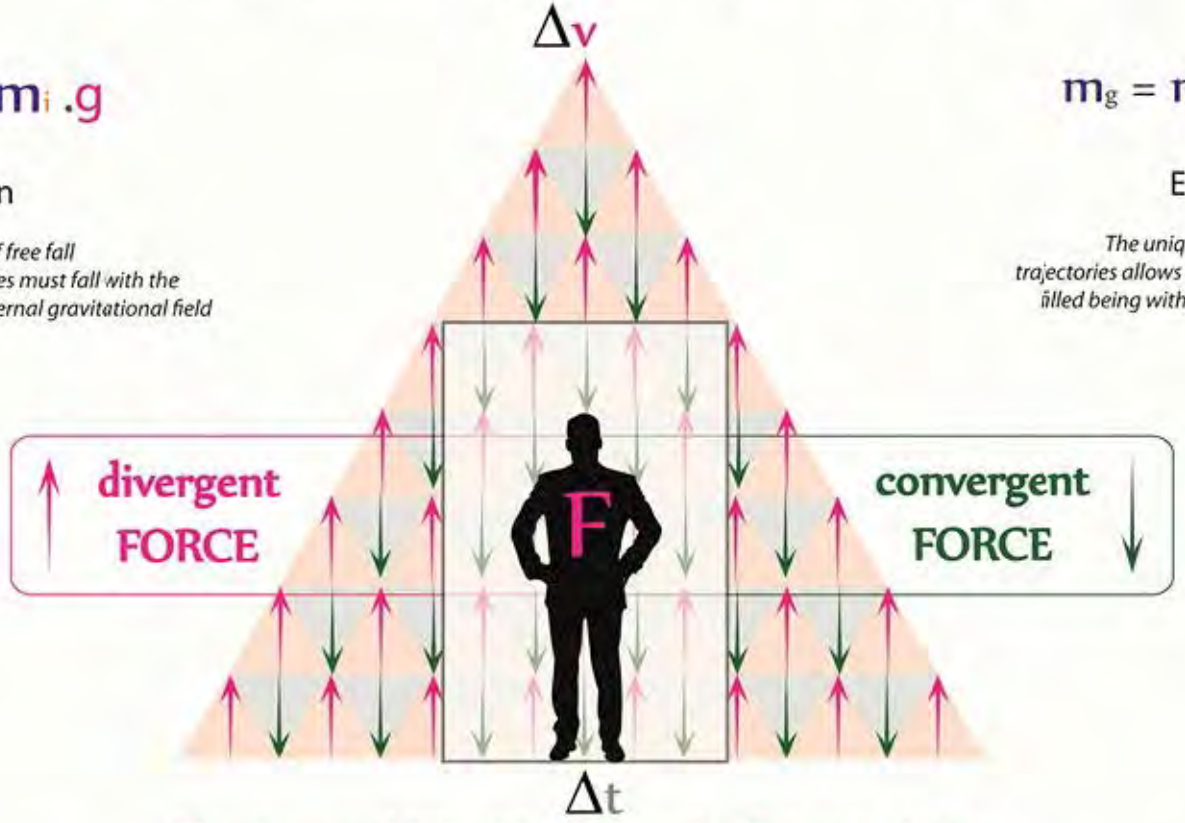
The uniqueness of free fall states than any two test bodies must fall with the same acceleration in a given external gravitational field

$m_g = m_i \sum_A \eta^A \frac{E^A}{c^2}$

Einstein

The uniqueness of free fall trajectories allows one to regard spacetime as filled being with curved energy gradients

$F = ma$

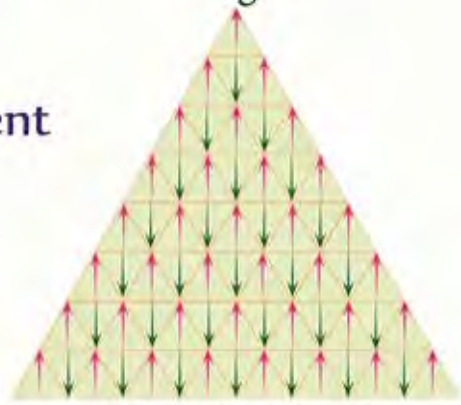


$F = mg$

F_i

acceleration vs inertial mass

F_g



acceleration vs gravitational mass

'There is no way of distinguishing between the effects on an observer of a uniform gravitational field and that of constant acceleration'

Inertial and Gravitational masses are equivalent

Of particular note is the fact that the relativistic formulation of the weak equivalence principle hints at the fact that mass-energies in all their forms must be accounted for and correctly modeled for an accurate picture of the mechanics of gravitiation on all-scales to be developed

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Einstein's Gravitational Constant

Newton gave a law for the behavior of objects that experienced gravitational forces:
$F = ma$, where $F = -m\nabla\phi$ for a given gravitational field ϕ

And along with Gauss & Poisson also gave a law determining how φ is generated:
$\nabla^2\phi = 4\pi G\rho$.

Einstein subsiquently re-expressed Newtonian Gravitation as a curvation of spacetime brought about by the presence of all mass-Energies

$$G_{ab} = \kappa T_{\mu\nu}$$

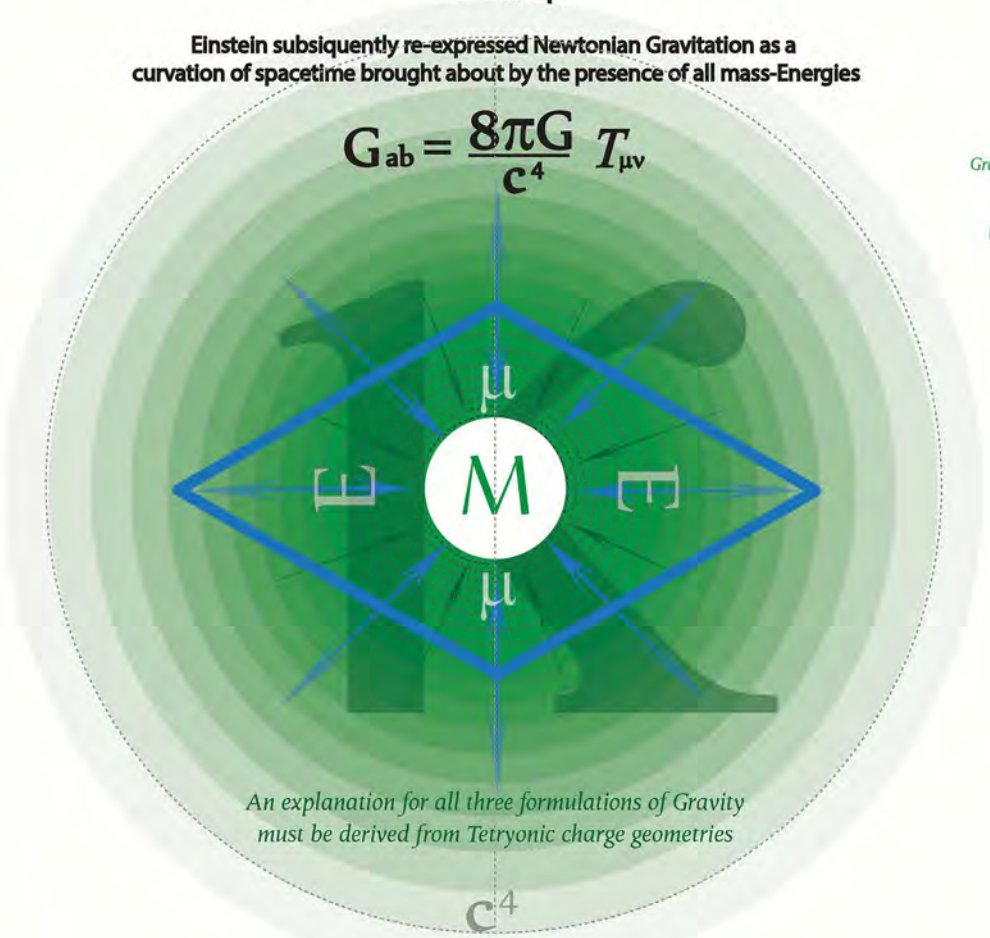
General Relativity

$$G_{ab} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

spactime curvature — *Gravitational constant* — *stress energies*

speed of light

Einstein viewed gravitation as the result of a curvature of spacetime created by a mass-energy-pressure gradiant



An explanation for all three formulations of Gravity must be derived from Tetryonic charge geometries

$$n\pi[mEM]$$

Tetryonic charged geometries

Gravitational Matter topologies — *Interactive mass-energy geometries*

$$T\pi\left[\frac{\rho}{c^4}\right] + n\pi\left[\frac{\rho}{c^2}\right]^2$$

3D spatial region — *2D spatial fields*

Tetryonics differentiates between Matter & interactive mass-energies via their charged geometries and topologies

EM

2D euclidean mass-energy-momenta

Rank 2 tensors

convergent & divergent forces

$$m = \frac{\rho}{c^2}$$

M

3D mass-Matter topologies

Rank 4 tensors

convergent pressure gradient

$$M = \frac{\rho}{c^4}$$

By modeling all mass-energy geometries and Matter topologies as a stress energy tensor General Relativity fails to differentiate between the interactive Forces of mass-energy momenta and gravitational Matter

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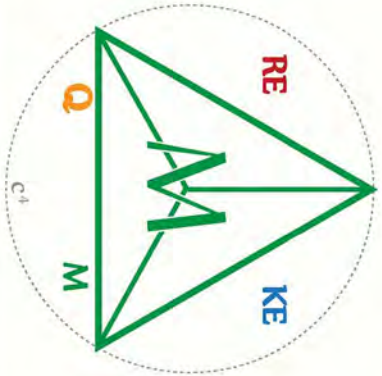
mass-energy-Matter spatial interactions

**No two Fermions [3D Matter topologies]
can occupy the same physical space
at the same time - Pauli exclusion**



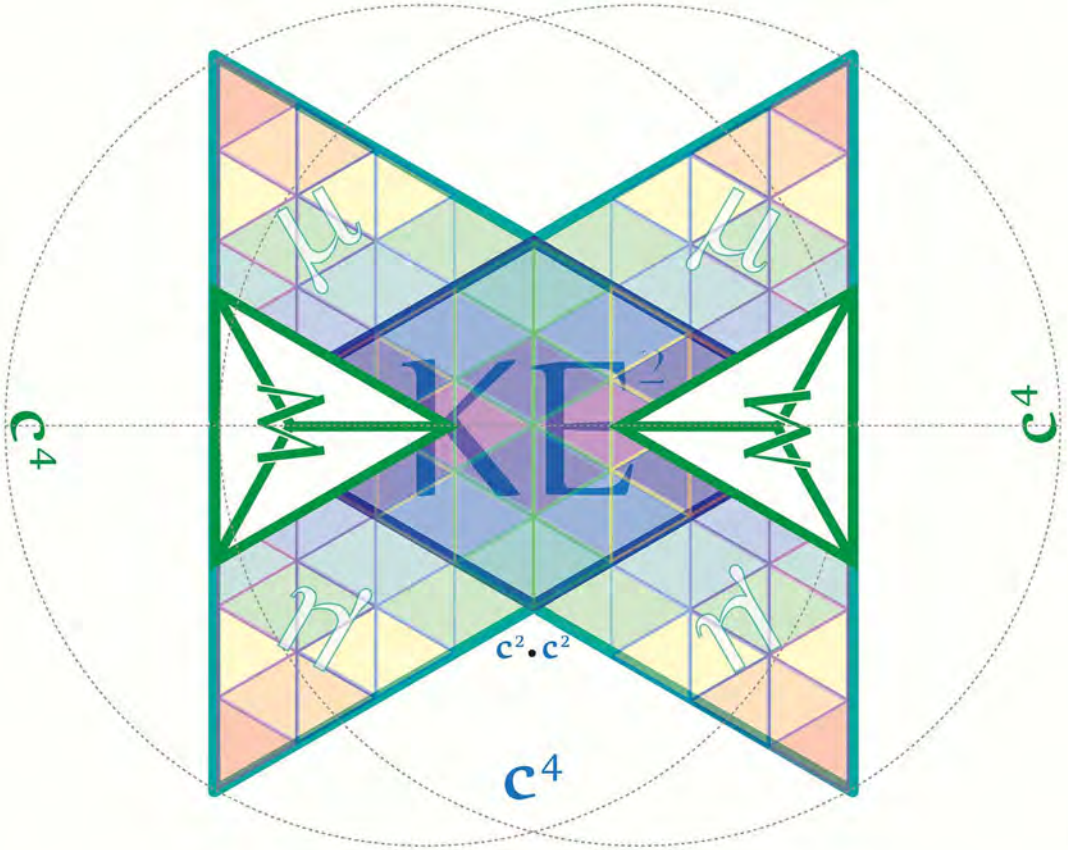
c^4

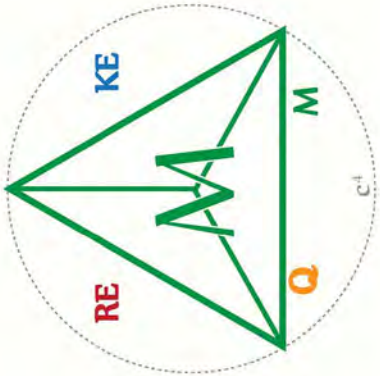
is a volumetric measure
of the amount of space
taken up by Matter

Fermions

$$\frac{4n\pi}{c^4}\left[\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v^2}\right]\right]$$

Planck quanta





c^4

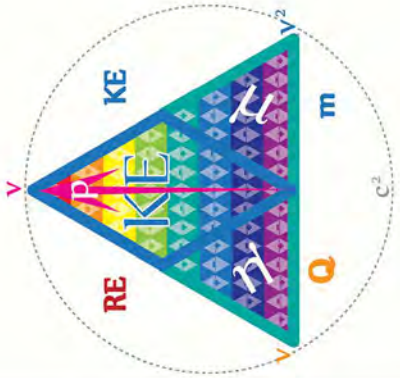
is also a spatial measure
of two superpositioned
interactive KEM fields

Force interaction

$$\frac{2\pi}{c^2}\bullet\frac{2\pi}{c^2}\left[\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v^2}\right]\right]$$

Planck quanta

**All separated particles
interact with each other via 2D fields of Force
(superpositioned [K]EM fields)**



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SR

Special relativity applies
Lorentz velocity corrections to
radiant mass-energy momenta

GR

General relativity applies SR
to total energy momenta
density-pressure gradients

Otto von Guericke, (1602-1686), a German physicist, performed a famous experiment: the "Magdeburg Hemispheres".

When two halves of a large, hollow metal ball had all the air removed from the volume they created when joined, two teams of horses couldn't pull them apart, because the pressure of the Earth's atmosphere (external to the volume created) exerted a very large force on the ball as it sought to equalise the pressure gradient created.

Nullspace energy pressure gradients

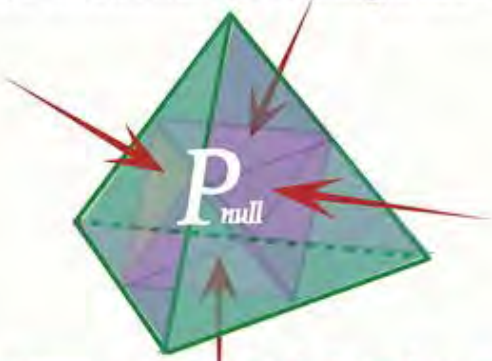
mass-energy geometries

$$P = \frac{Force}{Area} = \frac{F}{A} \Rightarrow \frac{F.d}{A.d} \Leftarrow \frac{W}{V} = \frac{Energy}{Volume} = U$$

mass-Matter topologies

The scalar mass-energies of all Matter topologies are all contained in their charged fascia

$n\pi\left[\frac{\rho}{c^2}\right]$



$T\pi\left[\frac{\rho}{c^4}\right]$

A Faraday cage is a metallic enclosure that prevents the entry or escape of an electromagnetic field (EM field)

All Matter topologies are ideal Faraday cages, quantum standing-waves of EM mass-energies that in turn create regions of nullspace

An ideal quantum Faraday cage consists of an unbroken, perfectly conducting shell. (a Matter topology of scalar mass-energies)

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Total stress energies & Matter

The stress energy tensor can be regarded only as a provisional means of representing all of the interactive mass-energies & gravitational Matter in any physical system.

$T_{\mu\nu}$

GR's Stress Energy Tensor does NOT differentiate between EM mass & Matter

Einstein

It is only in present circumstances that we find we have insufficient knowledge of the electromagnetic field of concentrated charges that compels us, provisionally, to leave, undetermined in present theory, the true form of this tensor...

The right hand side the EFE is a formal condensation of all things whose comprehension in the sense of a field theory is still problematic.

Not for a moment... did I doubt that this formulation was merely a makeshift in order to give the general principle of relativity a preliminary closed form expression.

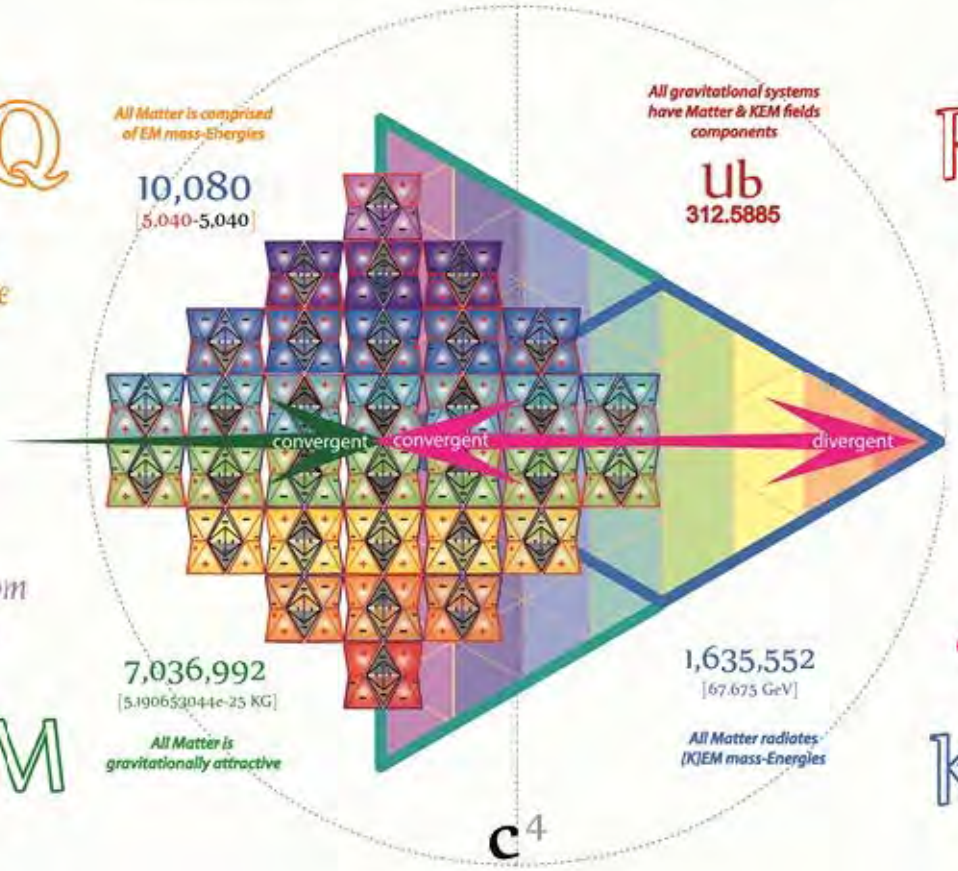
For it was essentially no more than a theory of the gravitational field, which was isolated somewhat artificially from a total field of as yet unknown structure.

Abraham

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}{}_{\text{velocity}}$$

$$\text{ENERGY}\ n\pi\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}{}_{\text{velocity}}$$

$$\text{Matter}\ \frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}{}_{\text{velocity}}$$



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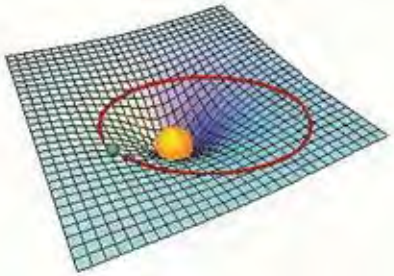
Einstein's Field Equation



"Spacetime tells Matter how to move; Matter tells spacetime how to curve"
John Archibald Wheeler

$$R_{ab} - \tfrac{1}{2}Rg_{ab} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

The solutions of the Einstein field equations are metrics of spacetime

General Relativity was developed to account for the observed perihilion precession of Mercury's orbit around the SUN
[only noticable through detailed observations after Newton developed his law of universal gravitation]

Newtonian G field

4π

the scalar curvature — the cosmological constant — Newton's gravitational constant

Ricci curvature tensor $R_{ab} - \frac{1}{2}g_{ab}R + \Lambda g_{ab} = \frac{8\pi G}{c^4} T_{\mu\nu}$ the stress-energy tensor

the metric tensor

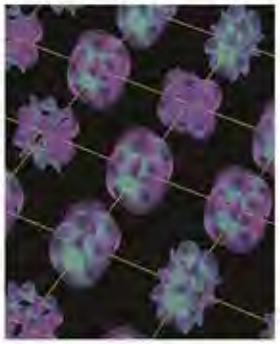
the spatial region of mass-energy-Matter being measured as determined by the speed of Energy in vacuum

Einstein's G field

8π

The EFE is a tensor equation relating a set of symmetric 4 x 4 tensors. Each tensor has 10 independent components

The EFE (based on SR principles) reduces to Newton's law of gravitation where the radiant mass-energy fields are weak and velocities are much less than the speed of light
[highlighting the inability of GR to distingush between radiant mass-energy geometries & the standing-wave Matter topologies comprising the total energies within the stress Energy tensor]



Curved Spacetime — *Einstein's gravitational constant*

$$G_{ab} + \Lambda g_{ab} = \kappa T_{\mu\nu}$$

the cosmological constant — *mass-ENERGY-Matter*

Despite the successes of General Relativity, the problems of quantum gravity and spacetime singularities remain open problems in its formulation of curved spacetime geometries

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Gravitation is Universal

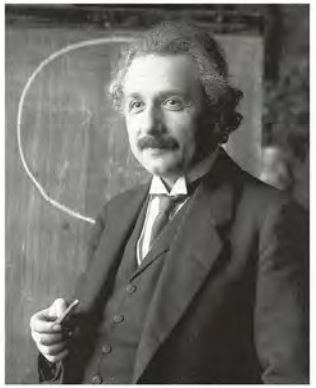
All Energies are quantised

Gravity results from curved spacetime

ZPF

m

M



VE

Quantum theory

Newtonian Mechanics

Relativity theory

Quantum gravity is the effort in theoretical physics to create a theory that includes both general relativity and the standard model of particle physics. Currently, these two theories describe different scales of nature and attempts to explore the scale where they overlap yield results that don't quite make sense, like the force of gravity (or curvature of spacetime) becoming infinite.

Euclidean quantum gravity
Scalar theories
Modified Newtonian dynamics (MOND)
Einstein–Cartan Bimetric theories
Tensor–vector–scalar
DGP model
Geometrodynamics
Loop Quantum Gravity
Lovelock theory
Kaluza–Klein theory
Induced gravity
Canonical Quantum Gravity
Jackiw–Teitelboim gravity
Liouville gravity
String theory
Quantum gravity
Causal Set theory
Brans–Dicke
Massive gravity
Composite gravity
Gravity as it is currently understood cannot be reconciled with the laws of quantum mechanics.
Scalar–tensor–vector
Teleparallelism
Causal dynamical triangulation
Conformal gravity
Nonsymmetric gravitation
2+1D topological gravity
Gauss–Bonnet gravity
Supergravity
Gauge theory gravity
f(R) gravity
Unified theory

hν	Q	G	SR	GR
1899	1785	1686	1905	1915
Planck's law	*Couolomb's law*	*Newton's law of Gravitation*	*Special relativity*	*General relativity*

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Without the aid of Tetryonic's charged geometries
Gravitational & EM fields point to mathematical singularities

Inverse squared Electric fields produce INTERACTIVE fields of force

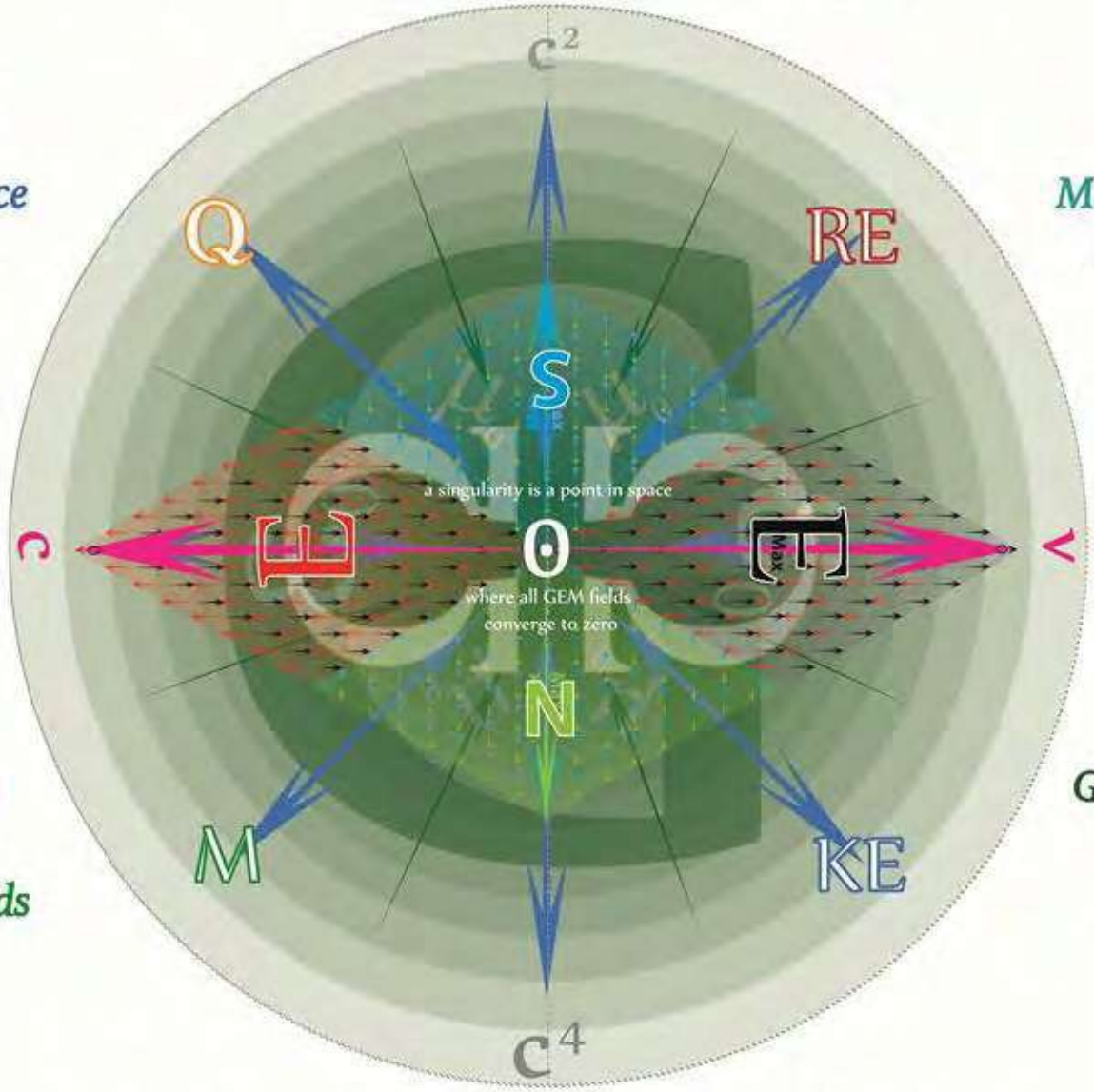
Inverse squared Magnetic fields produce PURTURBATIVE fields of force

There are NO Black Holes

There are NO point Particles

Matter produces CONVERGENT inverse squared fields of Gravity

Gravitation is the nett convergent force produced by all G-E-M fields



GravitoElectroMagnetic fields

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Matter topologies and gravity

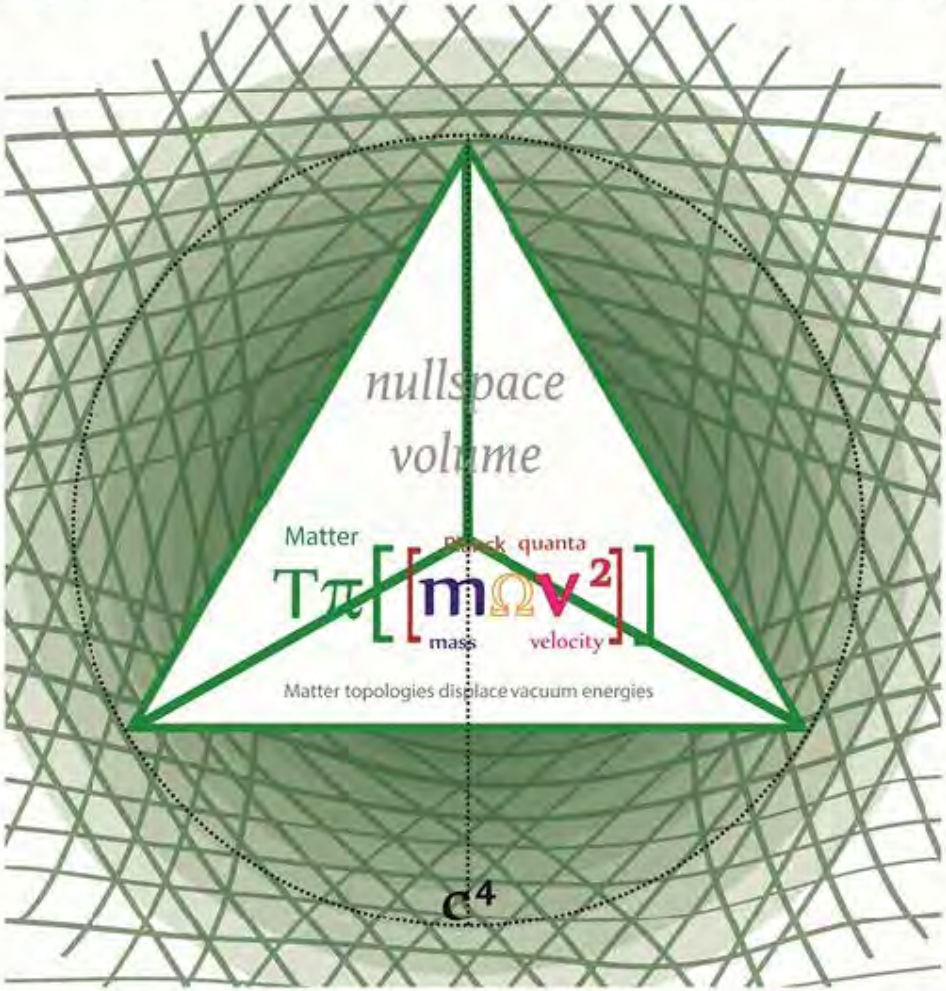
the positive spatial displacements created by tetrahedral standing-wave mass-energies displace vacuum energies found in those regions to create a energy density pressure gradient

A convergent Gravity field is the result of the higher density-pressure vacuum energies in any spatial region seeking to equalise the lower pressure regions of nullspace within Matter topologies

Matter has a Tetrahedral mass-energy quantum topology [non-Spherical]

M

The mass-energies of Matter topologies are stored in the integral surface area geometries of their charged fascia



Gravity itself is the result of vacuum energy pressure gradients not Coloumbic fields

G

Gravitation is the result of the convergent gravity AND interactive [k]EM fields that all quantum Matter topologies create

The resultant density-pressure gradients created by the displacement of vacuum energies by Matter topologies can be modelled using equilateral EM field geometries and a reduced Coloumb constant

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Spatial displacement of GEM energies by Matter topologies

The positive 4nπ displacement of vacuum eneriges by Matter topologies creates

Spatial energy density-pressure

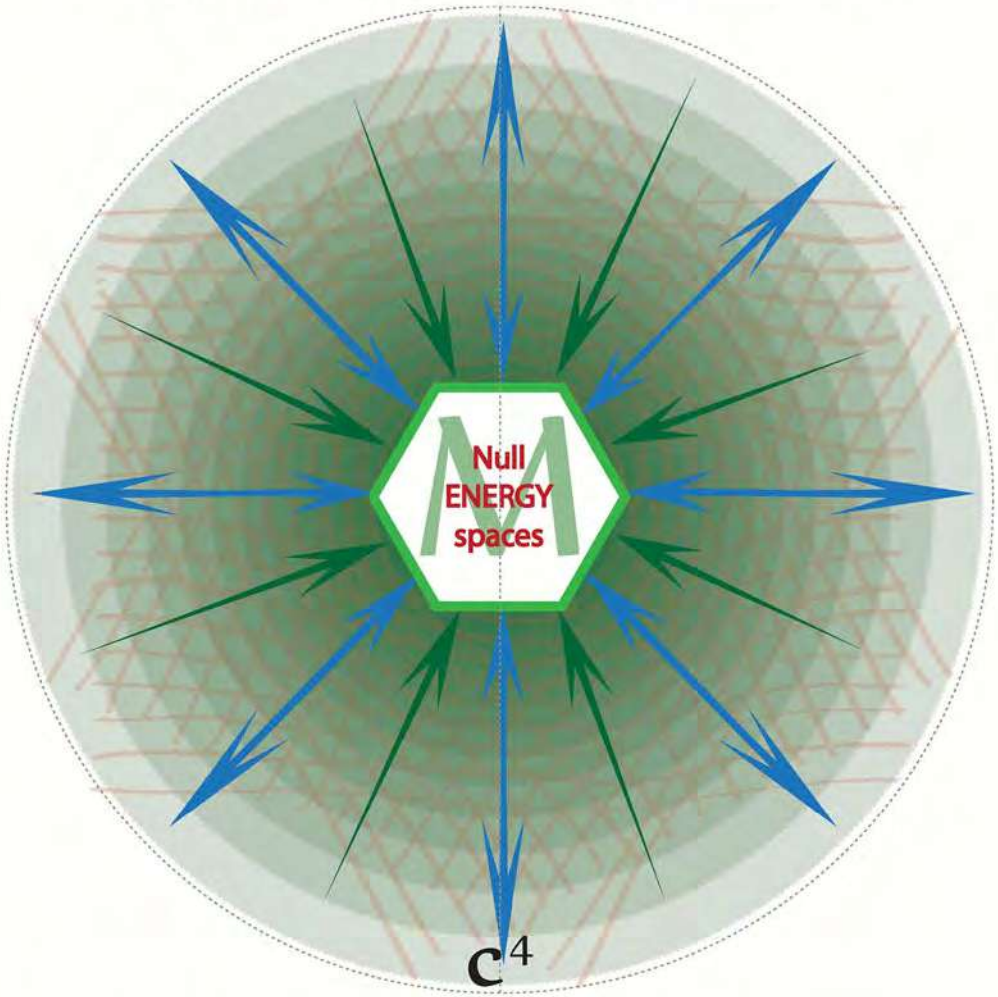
$$F = -G \frac{M_1 m_2}{r^2}$$

Planets orbit around the SUN

Newtonian fields models the resultant attraction as gravity

EM fields accelerate charged Matter

$$F = k \frac{Q_1 Q_2}{r^2}$$



$$G_{ab} = 8\pi G T_{\mu\nu}$$

All EM mass & Matter create stress energies

Einstein models the GEM energy densities as curved spacetime

Orbital precessions must be accounted for

Newton Einstein

4π vs. 8π

G G+SR

Convergent Gravitational fields

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Newtonian Gravity

model the observed, long range attraction between two bodies of Matter
[exclusive of the close range electromagnetic interactions of each body]

A gravity field is produced by the charged topology of mass-Matter
as it displaces vacuum energies and creates intrisic nullspace energy differentials

The strength of a Gravity field produced by Matter is proportional
to the total EM mass-energy geometry/topology of any body
and its convergent force can be modelled with
equilateral Tetryonic geometries

Single Body
Gravitational Field

$$F = -G\frac{M_1}{r^2}$$

G

Single Body
Gravitational Field

$$F = -G\frac{m_2}{r^2}$$

Two Body
Gravitational Field

$$F = -G\frac{M_1 m_2}{r^2}$$

However, unless it is at absolute zero all Matter topologies produce interactive EM fields that contribute to gravitational forces
as evidenced with the perihelion of Mercury where later observations revealed inaccuracies in Newton's formulation
for the motion of material bodies subject to convergent G forces & interactive EM fields

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Gravitational energies as a geometric mean

the geometric mean of two numbers is the square root of their product

EM standing waves [Matter] can be created and destroyed

EM mass-energies can be neither created or destroyed

Sir Issac Newton was the first to realise that gravity could be modelled as an inverse square Force

$$F = -G\frac{M_1 m_2}{r^2}$$

M

E

The Force of Gravity can be accurately modelled

Gravitational field of mass-Matter only

$$F_G = 4\pi G\rho$$

[ignoring EM interactions]

Gravitational energy of Matter in motion

$$G_{ab} = 8\pi G T_{\mu\nu}$$

[including KEM field interactions]

as the convergent geometric MEAN of interactive superpositioned E-fields that represent the total mass-energies of the gravitational Matter

$$F_G = \frac{M_1 . m_2}{r^2}$$

$$F_G = \sqrt{M_1 . m_2}$$

Gravity is the result of spatial energy density differentials created by the internal null-space volumes of Matter.
Energy (in all its forms) will seek to fill areas of lower pressure in search of universal equilbrium

Newton modelled the attractive forces between objects of Matter

GR models the energy density created by mass-Matter

Matter topologies are non-conservative and as they are destroyed the low pressure nullspace gradient [convergent gravitational Force] they created is replaced with conservative forms of radiative EM energy [interactive vacuum energies-photons]

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Gravitational Tidal Forces

The tidal force is a secondary effect of the force of gravity resulting from the geometry of massive bodies attracting each other.

Its geometric effects allow acceleration fields to be distingushed from pure graviation fields

Over a small area on the surface of a Gravitating body, gravitational attaction is often modelled as a uniform field acting downwards across the whole area.

The Gravity of a material body of mass-Matter has historically been defined as a strictly attracitve force between bodies

$$F = -G \frac{M_1 m_2}{r^2}$$

Tetryonics reveals Gravitation to be the nett result of 3 distinct interactions:
Convergent G-fields
Interactive E-fields and
Perturbative M-fields

mass-Matter topologies displace vacuum energies to create stress energy densities

All Gravitational fields accelerate objects towards the Centre of any Gravitational field produced by mass-Matter topologies

radiated [K]EM fields create vacuum energies

The directional pull of Gravity to the centre of Matter topologies (along with the increase in g forces as the radius of attraction decreases) creates Tidal forces on the body being accelerated

M

m

Satellite [moon]

r^2

In accordance with Newton's 3rd law there is an equal but opposite Force on the Earth produced by the Moon's graviational field resulting in Tides

In addition to Gravity all Matter radiates [K]EM fields that accelerate incident EM masses and Matter

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Tetryonic Gravitation

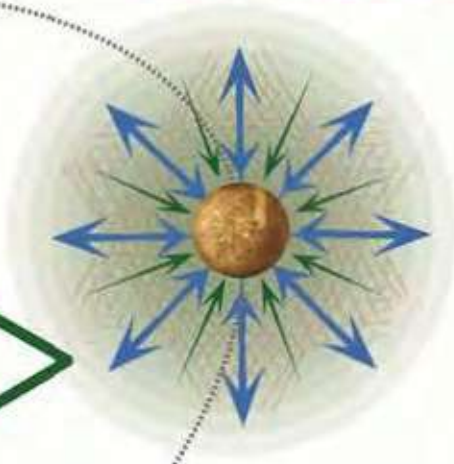
is the result of the combined interactions
of radiant EM geometries & Matter topologies
in any spatial region of measurement

[k]EM fields & Vacuum energy gradients
create energy momenta pressure differentials
that accelerate Matter

3D mass-Matter topologies
create nullspace
vacuum energy differentials

Radiant EM mass-energy densities
create [k]EM and Vacuum Energy fields

$$F = -G \frac{M_1 m_2}{r^2}$$



All massive bodies create interactive GEM fields
through their mass-energy geometries & Matter topologies
with convergent and divergent vectors of acceleration

[k]EM energy fields INTERACT
to provide additional acceleration to
EM mass-Matter close to material bodies

Gravity
ATTRACTS Matter
over large distances

$$G_{ab} = \kappa T_{\mu\nu}$$

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EM masses & Gravitational Matter

$\frac{\rho}{m^2}$

The core problem preventing the unification of Classical gravitation with QM & Relativity theory
is the imprecise formulation, definition and differentiation between mass & Matter

$\frac{\rho}{m^3}$

$$F = ma$$

mass is a conserved quantity
Matter is not a conserved quantity

$$F = -G\frac{M_1 m_2}{r^2}$$

inertial mass
active gravitational mass
passive gravitational mass

$$G_{ab} = \kappa T_{\mu\nu}$$

Even GR offers no clear distinction

$$E = mc^2$$

radiant mass-energy geometry

$$E = Mc^4$$

standing-wave Matter topology

General relativity has been heralded as a highly successful model of gravitation and cosmology, which has so far passed every unambiguous observational and experimental test.

Even so, there are strong indications the theory is incomplete

Without a clear, concise understanding and accurate models of the relationship between mass & Matter [and their interactions] a Unified Field theory is impossible

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

mass: Energy; Planck quanta; mass; velocity

mass is a geometric measure of a field's planar energy momenta content per unit Time

2D masses
bosons photons

$$mc^2 = E = Mc^4$$

Note: in both cases the amount of Energy described is identical
It is the changing spatial co-ordinate systems used to measure Energy in all it forms
that allows for the differentiation betweeen mass-energy geometries & Matter-energy topologies

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Matter: Energy; Planck quanta; mass; velocity

Matter is a topological measure of an object's planar mass-energy content per unit of Time

3D Matter
Fermions, Baryons

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mass-ENERGY-Matter equivalence

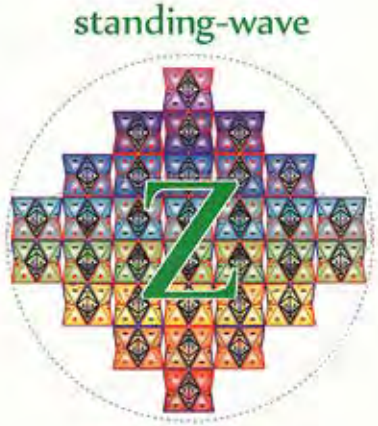
Einstein's mass-energy equivalence can be further refined and differentiated through charge geometries [in turn creating a symetric mass-ENERGY-Matter equivalence formulation]

The mass-energies of EM waveforms is contained within its charged geometry

$$E = mc^2$$

EM mass-energy is a property of Matter

mass



topologies

radiant EM mass geometry

$$\frac{m}{c^2} = M$$

standing-wave Matter topology

$$m = \frac{E}{c^2}$$

$$\frac{E}{c^4} = M$$

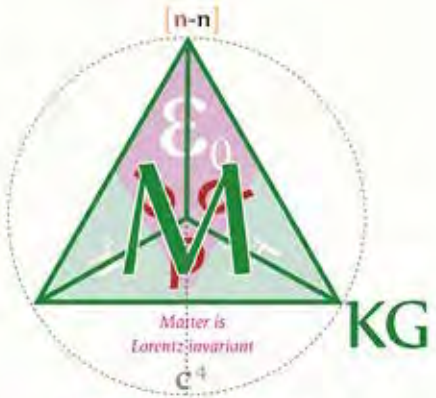
radiant

geometries

Matter is NOT a property of EM mass-energy

$$E = Mc^4$$

The mass-energies of Matter is contained entirely within its charged fascia topology



Matter

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Tetryonic unified GEM fields

Equilateral Tetryonic geometry/topology provides a unified quantum field equation to model all Gravito-Electro-Magnetic mass-ENERGY-Matter interactions

Bosons $\frac{ODD\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$ (Planck quarta; mass; velocity)

All Matter is comprised of CHARGED EM mass-Energies

Q

RE

The total energy of any system is comprised of Matter & KEM fields

ENERGY $n\pi\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass; velocity)

mass & Matter are distinct EM properties

The stress-Energy tensor includes all forms of energy

ENERGY $T\pi\left[m\Omega v^2\right]$ Matter mass

convergent Gravity

g

convergent [k]EM fields

k

divergent [k]EM fields

Equilateral energy momenta are geometrically related to the square of velocity

3D Matter geometry is determined by charge

All Matter in motion produces a [k]EM field

Matter $\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass; velocity)

All Matter is gravitationally ATTRACTIVE

M

KE

All Matter radiates INTERACTIVE [k]EM mass-Energies

EM waves $\frac{EVEN\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass; velocity)

Matter topologies create convergent gravity

&

mass-energy geometries create interactive forces

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Quantum Gravity

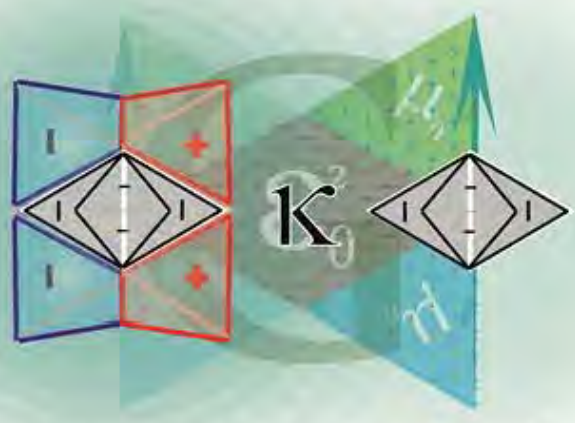
At present, one of the deepest problems of modern theoretical physics is the unification of General Relativity, which describes gravitation, and applies to large-scale structures (stars, planets, galaxies), with Quantum Mechanics, which describes the other three fundamental forces acting on the atomic scale

M

Newtonian Gravitation models observed motions of large-scale MATTER

G

The large scale Cosmos is ruled by GRAVITY



$T_{\mu\nu}$

Einstein's GR models interactions of all mass-energy-Matter

k

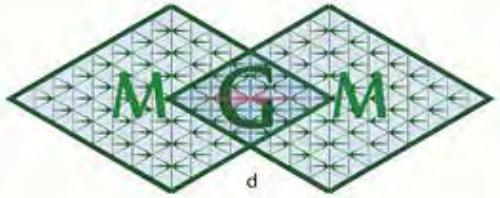
The Quantum world is ruled by ELECTROMAGNETISM

There are major points of tension between Quantum mechanics and General relativity.

Firstly, classical general relativity breaks down at singularities, and Quantum mechanics becomes inconsistent with general relativity in the neighborhood of singularities

Secondly, it is not clear how to determine the gravitational field of a particle, since under the Heisenberg uncertainty principle of Quantum mechanics its location and velocity at any instant of Time cannot be known with certainty.

Thirdly, there is the Problem of Time in Quantum gravity. Time has a different meanings in Quantum mechanics and General relativity and hence there are subtle issues to resolve when trying to formulate a theory which combines the two.



Gravitational attraction is a convergent Force between Matter

Newton

Gravitation results from energy density-pressure gradients

Einstein

Attempts to generalize ordinary quantum field theories, used in elementary particle physics to describe the fundamental interaction of gravity have to date led to serious problems.

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Gravitons

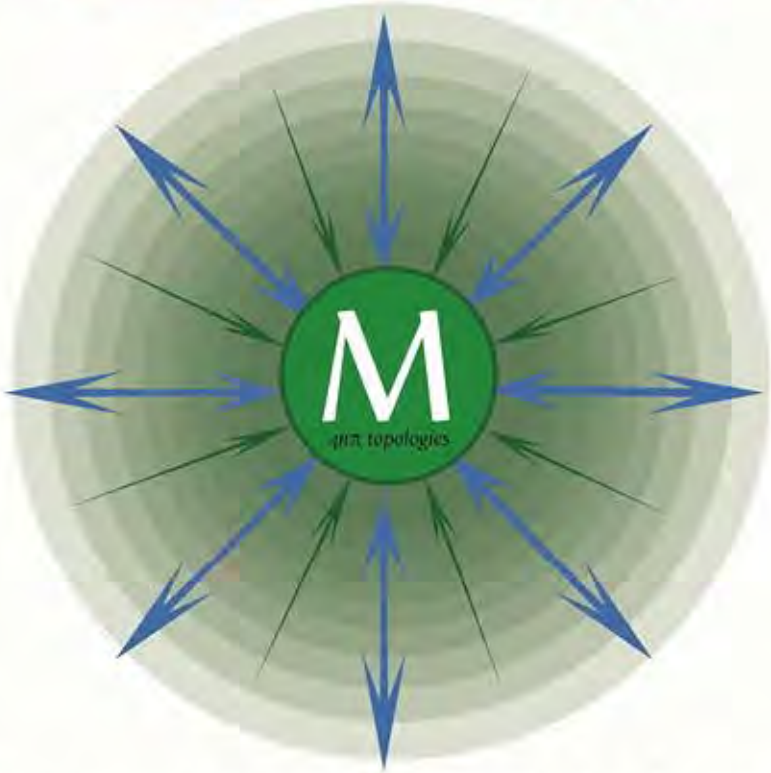
Gravitons are not required in Tetryonic theory as gravitational attraction is a convergent force created by the EM energy differential produced by 3D Matter topologies in a vacuum energy field

All standing-wave Matter geometries create Gravity

G

CONVERGENT Gravitation

Gravitons are the hypothetical carriers of the attractive Gravitational FORCE



Radiant EM fields are produced by all Matter in motion

EM

DIVERGENT ElectroMagnetism

Photons are the carriers of the interactive ElectroMagnetic FORCE

Gravitons were proposed as the gravitational equivalent of the Photon in ElectroMagnetic theory but have never been detected

$4\pi G$

They were postulated because of the great success of quantum field theory (in particular, the Standard Model) at modeling the behavior of all other known forces of nature as being mediated by elementary particles: electromagnetism by the photon, the strong interaction by the gluons, and the weak interaction by the W and Z bosons.

$8\pi G$

The hypothesis was that the gravitational interaction is likewise mediated by a – yet undiscovered – elementary particle, dubbed the graviton. In the classical limit the theory would allow Newton's law of gravitation in the weak-field limit to conform with Einstein's field equations of General relativity

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Laplacian field interactions

$$Z = \frac{\rho}{c^2} = \varepsilon_0 \mu_0$$

impedance of a medium; energy density; field geometry; electric permittivity; magnetic permeability

$$G_P = \kappa \frac{\rho}{c^4}$$

Einstein's constant; energy density; pressure gradient; 4-vol volume

The planar two-dimensional Laplacian is given by

$$\Delta = \nabla^2 = \nabla \quad \nabla = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}$$

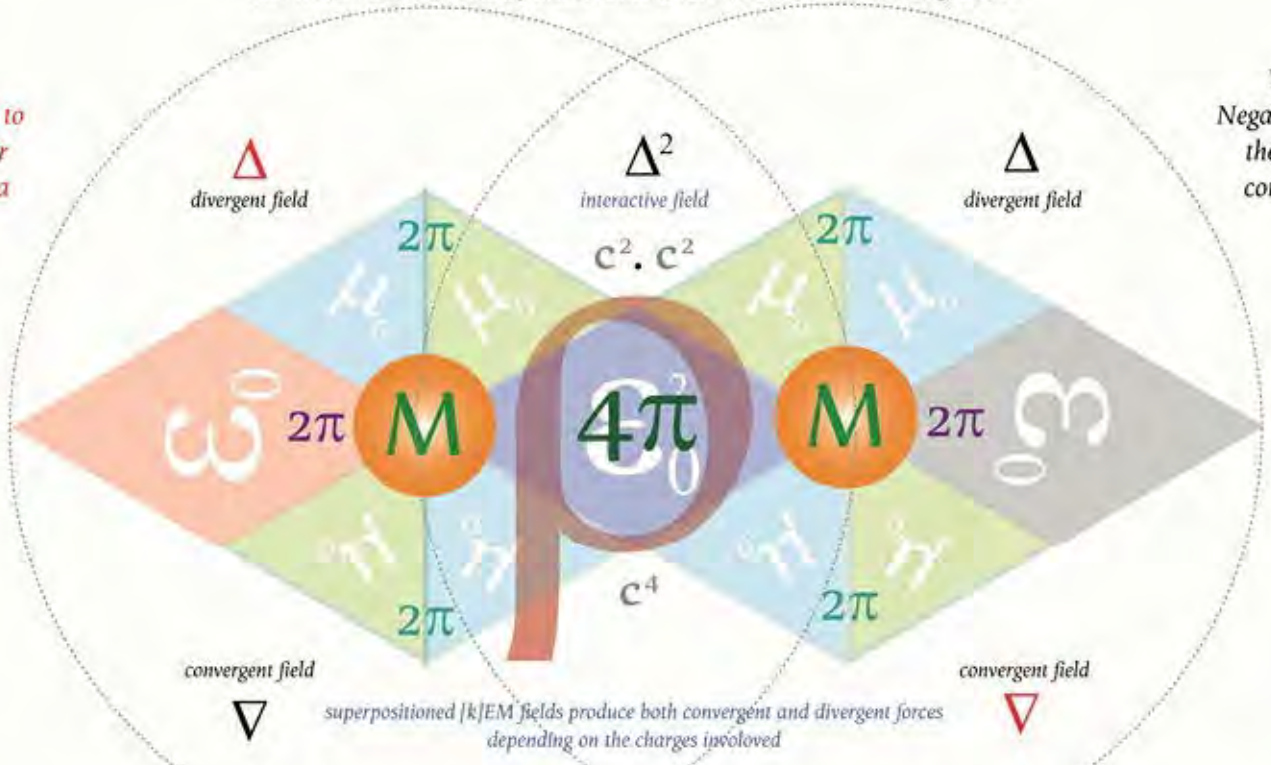
This fundamental differential operator of Applied Mathematics was introduced by Laplace in his 1782 study of the force of gravitational attraction exerted by spheroids and was named after him by Maxwell in his 1873 treatise on electromagnetism.

The net divergence of Positive charge fields is due to the anti-symmetry of their component Planck quanta

The net divergence of Negative charge fields is due to the anti-symmetry of their component Planck quanta

$$E = \frac{\rho}{c^2 \mu_0}$$

$$B = \frac{\rho}{c^2 \varepsilon_0}$$



The Laplacian of any scalar field is interpreted as being the limit of the net outward flux per unit enclosed area of this field through a closed contour surrounding the point of evaluation

$$\Delta\phi = \lim_{A \to 0} \frac{1}{A} \oint_{\partial D} \frac{\partial \phi}{\partial \nu} \, dl, \quad A = \text{area}(D)$$

co-ordinate-free representation of the Laplacian

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Newton's Gravitational Constant has been shown to be a greatly reduced version of Coulomb's Electric Interaction Constant

$$\frac{Q\,k\rho\,G\,M}{r^2\,\kappa\,c^4}$$

Newtonian Gravitation models the observed convergent force of GEM interactions that results in the motion of large-scale Matter

Any compete Unified field equation for Gravitation must take into account both the Nullspace gravitation resulting from Matter topologies as well as the Coulombic 2D interaction fields that result from charge and the motion of Matter through the aether

Combined Interactive & Gravitational Forces

mass-energy-Matter

$$G_P = \kappa \frac{\rho}{c^4}$$

spatial volume

Coulomb's Law

$$P+\left[\frac{2\pi[mv^2]}{c^2}\right]_{Q_1}\ k\ \left[\frac{2\pi[mv^2]}{c^2}\right]_{Q_2}e-$$

[24-12] KE [1-0] KE [0-1] [0-12]

Coulombic [k]EM fields

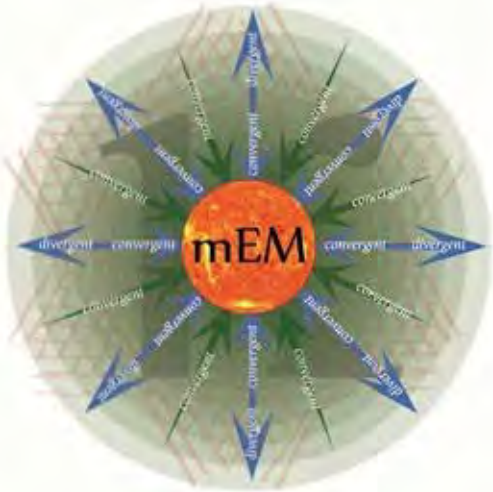
Divergent [Interaction] radiative EM Fields

$$P+\left[\frac{T\pi[m]}{c^4}+\left[\frac{n\pi[mv^2]}{c^2}\right]_{mass}\ \kappa\ \left[\frac{n\pi[mv^2]}{c^2}\right]_{mass}+\frac{T\pi[m]}{c^4}\right]e-$$

[k]EM interactive superpositioned EM fields of Force [k]EM

Matter — *convergent gravitational field of Force* — *Matter*

Einstein's constant



Newton's Law

$$P+\left[\frac{4n\pi[mc^2]}{c^2}\right]_{M_1}\ G\ \left[\frac{4n\pi[mc^2]}{c^2}\right]_{M_2}e-$$

[2,25e23] [1.2e20]

Gravitational Matter

Convergent [Attractive] Gravity Field

The observed net convergent force between objects of mass-Matter are the result of convergent G & interactive EM fields

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vacuum impedance $Z = \frac{1}{c^2} = \varepsilon_0 \mu_0$ (electric permittivity, magnetic permeability)

The energy density pressure gradient produced by the positive dispacement of vacuum energies by 3D standing-wave mass-Matter topologies is a strictly convergent force

mass-energy density $G_P = \kappa \frac{\rho}{c^4}$ (spatial region)

$P = \frac{kT}{V}$

CHARGED mass-energy geometries create Matter topologies

Q

RE

mass-Matter-Vacuum energy displacements contributes to STRESS energies

M

All Matter is gravitationally ATTRACTIVE

m

Gravity fields produce a convergent inverse square force

mass-Matter topologies displace vacuum energies to create gravity

M

KE

All Matter radiates INTERACTIVE [k]EM mass-energy momenta

$\nabla\phi\, grav = 4\pi G\rho$

The pressure Force of Gravity is proportional to the amount of mass-Matter in a system and can be modelled with weak superpositioned E-field geometries

$F = -G \frac{M_1 m_2}{r^2}$

c^4

$G = \frac{8\pi G}{c^4} T_{\mu\nu}$

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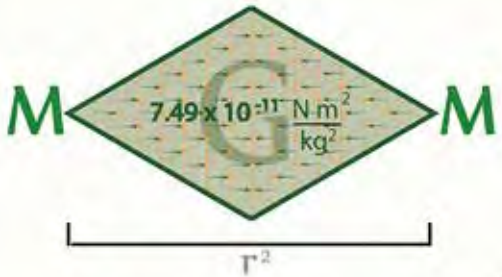
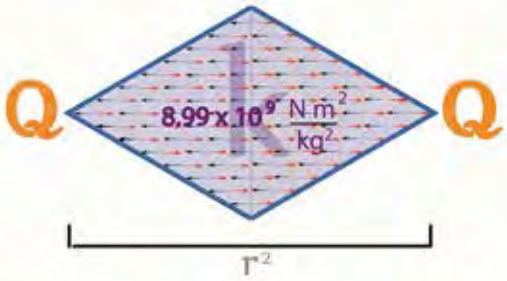
Inverse squared interactive E-fields

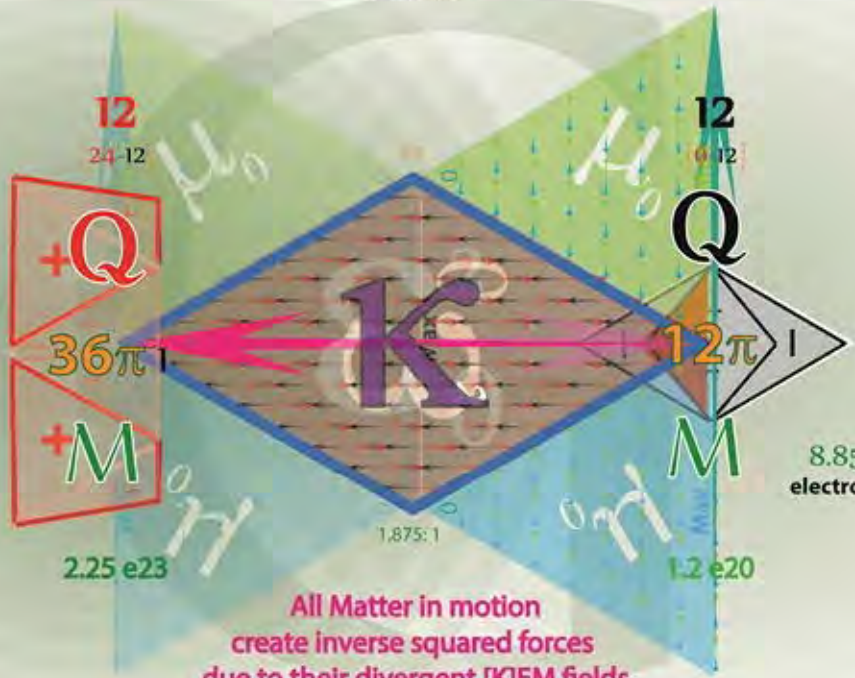


wherever mass-energies create standing-wave topologies they also create Gravity



wherever there exists mass-energy imbalances energy will seek equilibirum via radiant EM fields

Although present, the Gravitational Attraction between quantum scale Matter particles is vastly overwhelmed by the Coulombic Interaction field resulting from the nett Charge Imbalances of Matter and its fields of motion



Protons have Stronger G fields than electrons but weaker [k]EM fields

P+

1.6596×10⁻²⁷ KG
proton mass-Matter

e–

electrons have Weaker G fields than Protons but stronger [k]EM fields

8.8514×10⁻³¹ KG
electron mass-Matter

All Matter in motion create inverse squared forces due to their divergent [K]EM fields

KEM

superpositioned kEM fields create forces of attraction & repulsion

Gravity creates a strictly convergent force of attraction

$$\frac{G}{c^4}$$

M

Matter *mass-energy*

$36\pi * 25n^2$

topology *geometry*

mass-Matter topologies displace vacuum energies to form convergent gravity

Matter *mass-energy*

$12\pi * 1n^2$

topology *geometry*

[k]EM

Equilateral [k]EM mass-energies contribute to the total stress energies of any region

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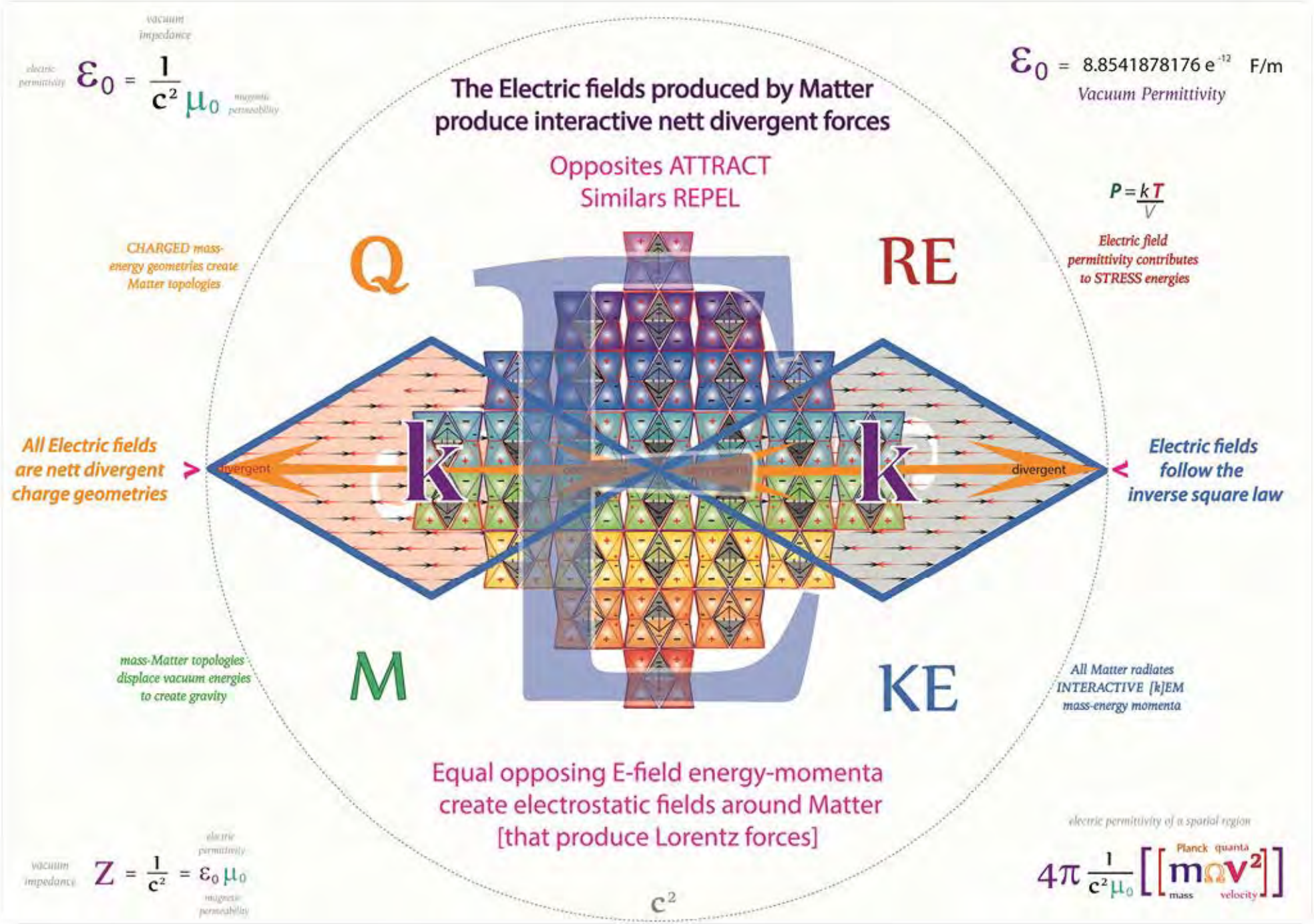

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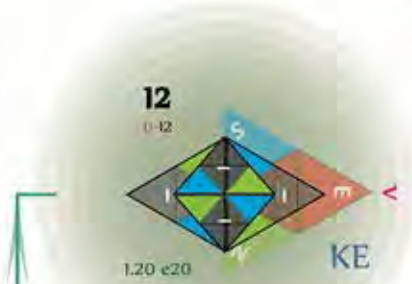
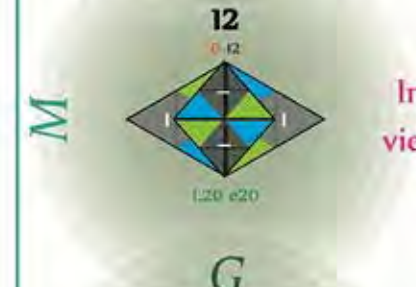
Perturbative M-forces

ElectroMagnetism is a velocity dependent vector interaction that dominates the Gravitational attraction of Matter



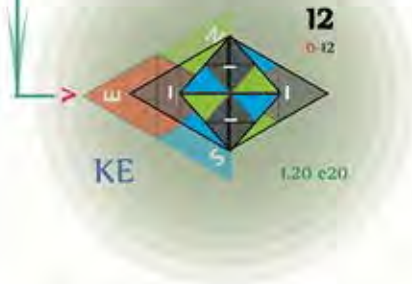
G



M

Inertial viewpoint

G



The Gravitational forces on the central particle are always equal irrespective of the inertial viewpoints

EM

Maxwells ElectroMagnetism

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$\nabla \cdot \mathbf{B} = 0$$

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$

$$\nabla \times \mathbf{B} = \frac{1}{\epsilon_0 c^2}\mathbf{J} + \frac{1}{c^2}\frac{\partial \mathbf{E}}{\partial t}$$

[k]EM fields have electric and magnetic field components

The Tetryonic GEM model reveals the interplay of Convergent [Gravity], interactive [E-fields] & perturbative [M-field] forces

Gravitational Matter is ALWAYS attractive vectorial ElectroMagnetic fields are interactive

Gravity can be modelled with pseudo-electric and pseudo-magnetic field components

GravitoElectroMagnetism

$$\nabla \cdot \mathbf{E}_g = -4\pi G\rho_g$$

$$\nabla \cdot \mathbf{B}_g = 0$$

$$\nabla \times \mathbf{E}_g = -\frac{\partial \mathbf{B}_g}{\partial t}$$

$$\nabla \times \mathbf{B}_g = -\frac{4\pi G}{c^2}\mathbf{J}_g + \frac{1}{c^2}\frac{\partial \mathbf{E}_g}{\partial t}$$

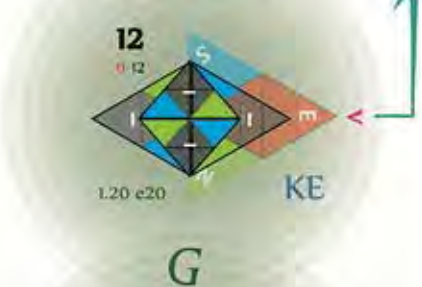
G

The sign of the effect is different (attraction in one case, repulsion in another), but this is just because in electromagnetism the sign of the electric part of the acceleration is opposite that of gravity: electric charges of the same type repel each other, while in gravity two massive objects attract.

Apart from this sign, there is such a close analogy to magnetism that this velocity-dependent gravitational effect is often termed Gravito-magnetism

G

M



G

Inertial viewpoint

The ElectroMagnetic forces resulting from inertial motion in a different frame of reference produces different KINETIC [EM] forces

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vacuum impedance

magnetic permeability $\mu_0 = \frac{1}{c^2 \varepsilon_0}$ electric permittivity

$\mu_0 = 1.2566370614\,e^{-12}$ N/A^2

Vacuum Permeability

The Magnetic fields of Matter produce perturbative interactions

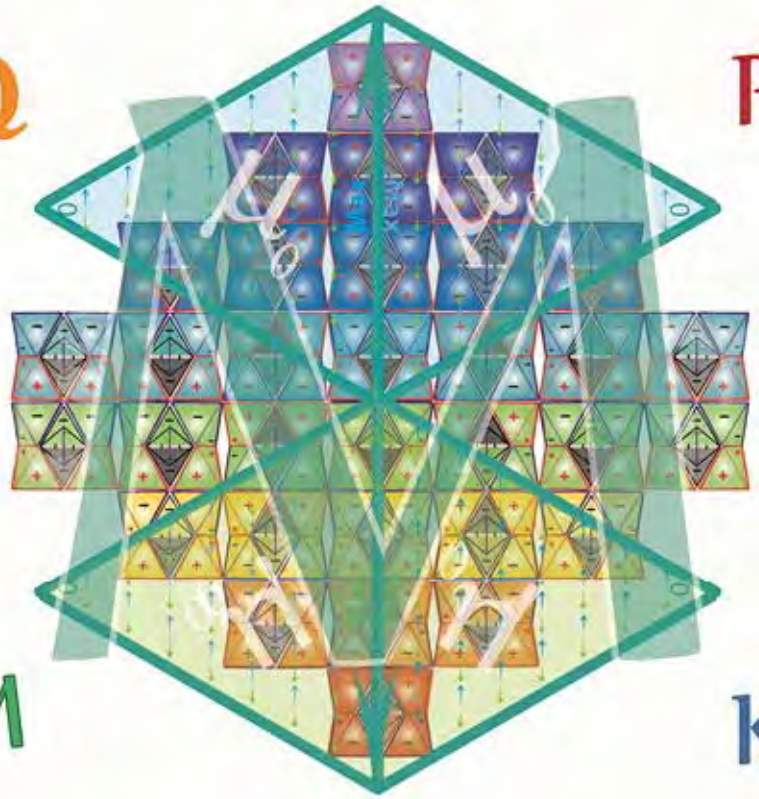
$P = \frac{kT}{V}$

Magnetic field permeability contributes to STRESS energies

CHARGED mass-energy geometries create Matter topologies

Q

RE



Magnetic dipoles follow the inverse cubed law

Magnetic fields follow the inverse square law

mass-Matter topologies displace vacuum energies to create gravity

M

KE

All Matter radiates INTERACTIVE [k]EM mass-energy momenta

Matter posesses a secondary magnetic moment that is subject to Lorentz forces

vacuum impedance $Z = \frac{1}{c^2} = \varepsilon_0 \mu_0$ magnetic permeability

electric permittivity

c^2

magnetic permeability of a spatial region

$4\pi \frac{1}{c^2 \varepsilon_0} [[m \Omega v^2]]$

Planck quanta

mass velocity

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Gravitational & EM fields

Any unified Field equation that attempts to accurately model celestial scale gravitational attraction must also take into account KEM field interactions between the bodies resulting from their respective motions

Q

RE

1:0.0123

Gravity is created by vacuum energy displacement produced by Matter topologies in vacuum energy fields

along with displaced Vacuum energy gradients

Interactive E-fields and perturbative M-fields

also contribute to the nett convergent gravitational field

M

KEM

All Matter produces a nett Gravitational [convergent] force as a direct result of its mass-Matter topologies & KEM mass-energies

mass-Matter

5.9736×10^{24} KG

Earth

$2.8673e26\ \pi$

displacement topology

interactive KEM field mass-energy momenta

$$\left[\frac{4n\pi}{c^4}[\rho]_{mass} + \left[2n\pi\frac{[\rho]_{EM\ mass}}{c^2}\ \kappa\ 2n\pi\frac{[\rho]_{EM\ mass}}{c^2}\right] + \frac{4n\pi}{c^4}[\rho]_{mass}\right]$$

$$r^2$$

Gravitational gradients can be modelled as weak KEM fields

mass-Matter

7.3477×10^{22} KG

moon

$3.526e24\ \pi$

displacement topology

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Independently and almost simultaneously in1964 three groups of physicists proposed the proposed the Higgs mechanism thorugh which the inertial mass properties of Matter are created:
François Englert and Robert Brout; by Peter Higgs (inspired by ideas of Philip Anderson); and by Gerald Guralnik, C. R. Hagen, and Tom Kibble.

The Higgs mechanism was incorporated into modern particle physics

The Higgs Mechanism
Finding this particle would give an insight into why particles have certain mass, and help to develop subsequent physics. The technical problem is that we do not know the mass of the Higgs boson itself, which makes it more difficult to identify. Physicists have to look for it by systematically searching a range of masses within which it is predicted to exist., which will determine its existence.
If it turns out that we cannot find it, this will leave the field wide open for physicists to develop a completely new theory to explain the origin of a particle's mass

by Steven Weinberg and Abdus Salam, and is an essential part of the standard model.

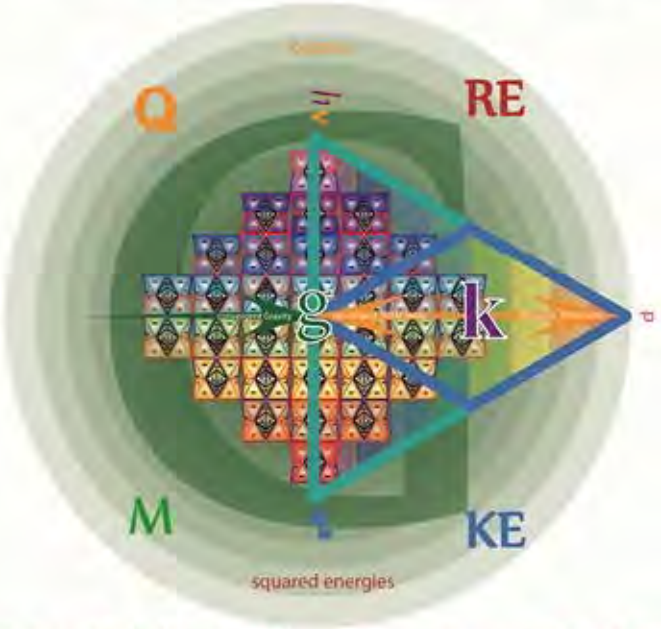
As the Universe cooled and the temperature fell below a critical value, an invisible force field called the 'Higgs field' was formed together with the associated 'Higgs boson'

The Higgs mechanism is a process by which vector bosons can obtain mass

M

TETRYONS / FERMIONS / BARYONS
3D tetrahedral standing-waves
[4nπ EM mass-Matter topologies]
interact with the vacuum energy aether

Matter



m

BOSONS / PHOTONS
2D planar matterless fields
[nπ EM mass-energy geometries]
'slice' through the vacuum energy aether

EM masses

Tetryonics is a full relativistic unified theory of electromagnetic mass-ENERGY & Matter and motion in which the classical properties of inerital mass and quantum mechanical quantised energy momenta are explained as being direct result of the geometric properties of inductive equilateral energies moving through external electromagnetic fields

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Applying the Unified Field Equation

for ElectroMagnetic masses & Matter interactions

All Matter has a 4π standing-wave mass-energy topology

Matter topologies

$$G_{ab} = 8\pi G T_{\mu\nu}$$

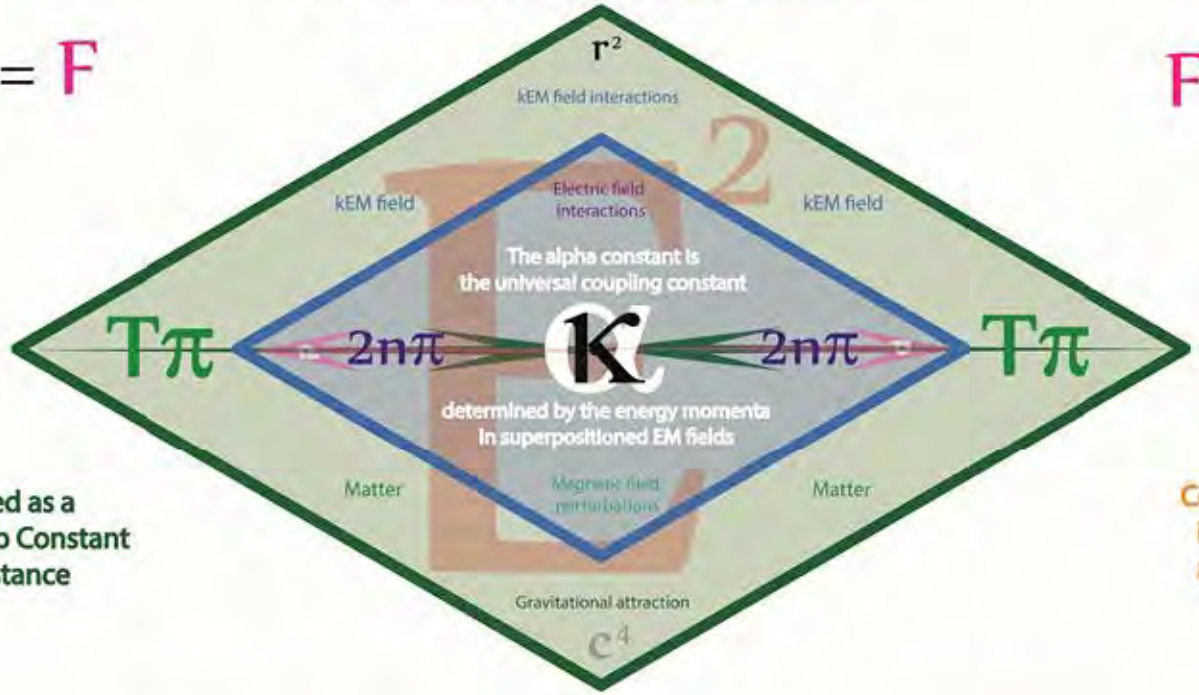
The net gravitational force is the geometric mean of all EM mass-ENERGY-Matter interactions

All kEM waves have 4π superpositioned mass-energy geometries

mass-ENERGY geometries

$$-G\frac{M_1 m_2}{r^2} = F$$

$$F = k\frac{Q_1 Q_2}{r^2}$$



G

k

Gravity can be modelled as a reduced negative Coloumb Constant acting over a large distance

Coloumb's Constant is a large interactive Electric constant acting over a short distance

Tetryons - 4π
Leptons - 12π
Quarks - 12π
Mesons - 24π
Baryons - 36π

Ignoring interactive [k]EM field interactions reduces GR [k] to Newtonian [G]

$$G_{ab} = 4\pi G T_{\mu\nu}$$

Charges - 1π

Photons -2π

EM Fields - 2nπ

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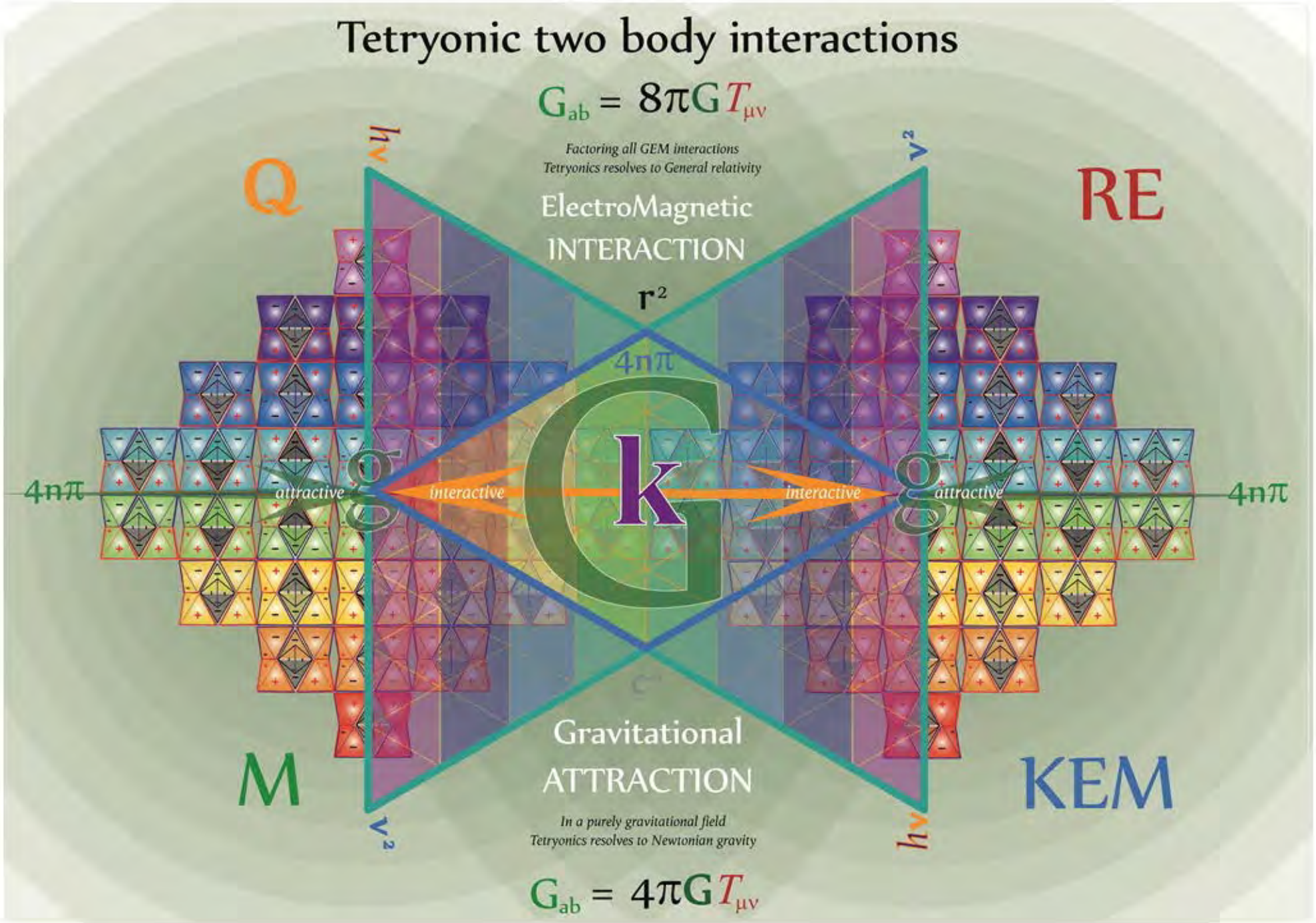

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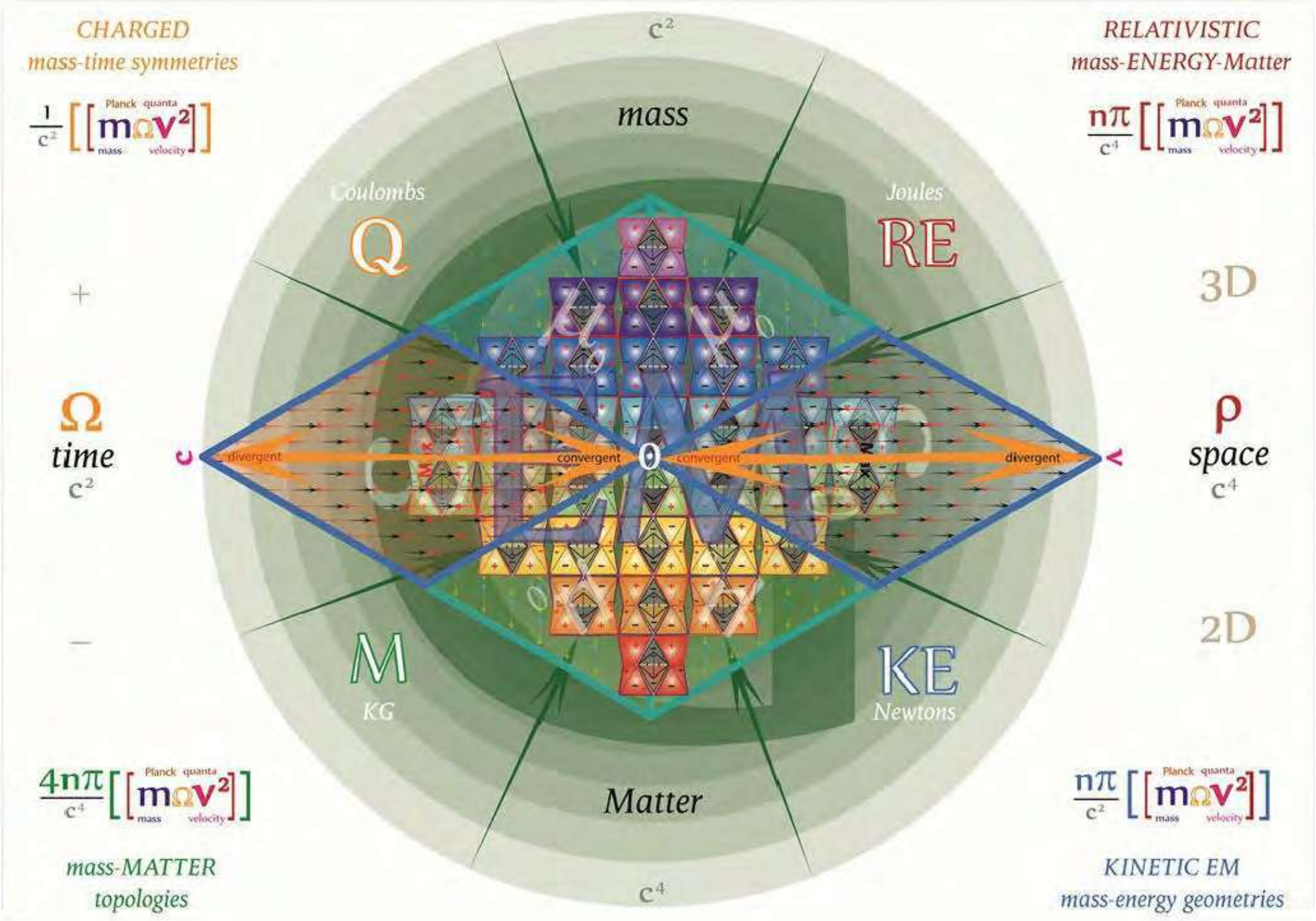

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Our EM SUN

The SUN (like the Planets) is a CHARGED body moving through an EM environment

G & E fields obey the inverse SQUARED laws

The nett Charge of a body is the result of an excess of one type of energy quanta and is reflective of their charged topologies [ie ionised Matter]

Neutral Magnetic Pole

Solar wind

Solar wind

Positive ions stream outward from the Sun's surface and accelerate away

Q

Positive ions stream outward from the Sun's surface and accelerate away

Negative ions flow inward

Neutral Magnetic Pole

The charged E field [heliosphere] of our SUN interacts with other charged planetary bodies

Magnetic dipole fields follow the inverse CUBED law

Solar eclipses allow us to view

the SUN's EM corona in detail

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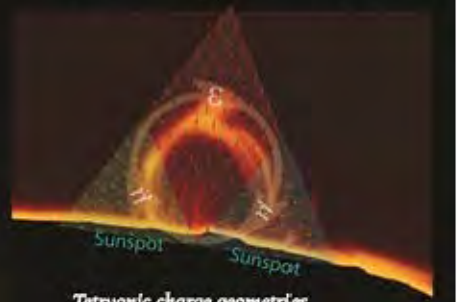
Prominences

Flares, Prominences and CMEs are the result of Electro-Magnetic geometries

Solar Dynamics



Tetryonic charge geometries explain Solar EM field dynamics

The SUN is a ElectroMagnetohydrodynamo

When multiple charged fascia interact they flare produce and CMEs

Prominence

Maximum E field strength
1 million Kelvin

6000 Kelvin

Sunspot

Sunspot

Sunspot

Sunspot

Positive ions stream outward from the Sun's surface and accelerate away

The SUN (like the Planets) is a CHARGED body moving through an EM environment

Where Solar EM loops breakdown or interact flares result

Solar Flares

The breaking of large inductive EM loops creates CMEs [Coronal Matter Ejections]

CMEs

The Earth is located at an average distance of about 150 million kilometers [1AU] from the Sun
It takes sunlight travelling at the speed of Light [c] about 8.3 minutes to cross this distance and reach the Earth.

BUT due to the nature of Longitudinal waves emitted by the SUN mechanical momenta impulses [action-at-a-distance] can be transfered from the SUN to the planets nearly instantaneously providing the mechanism for Newton's instataneous pull of Gravity on planetary bodies

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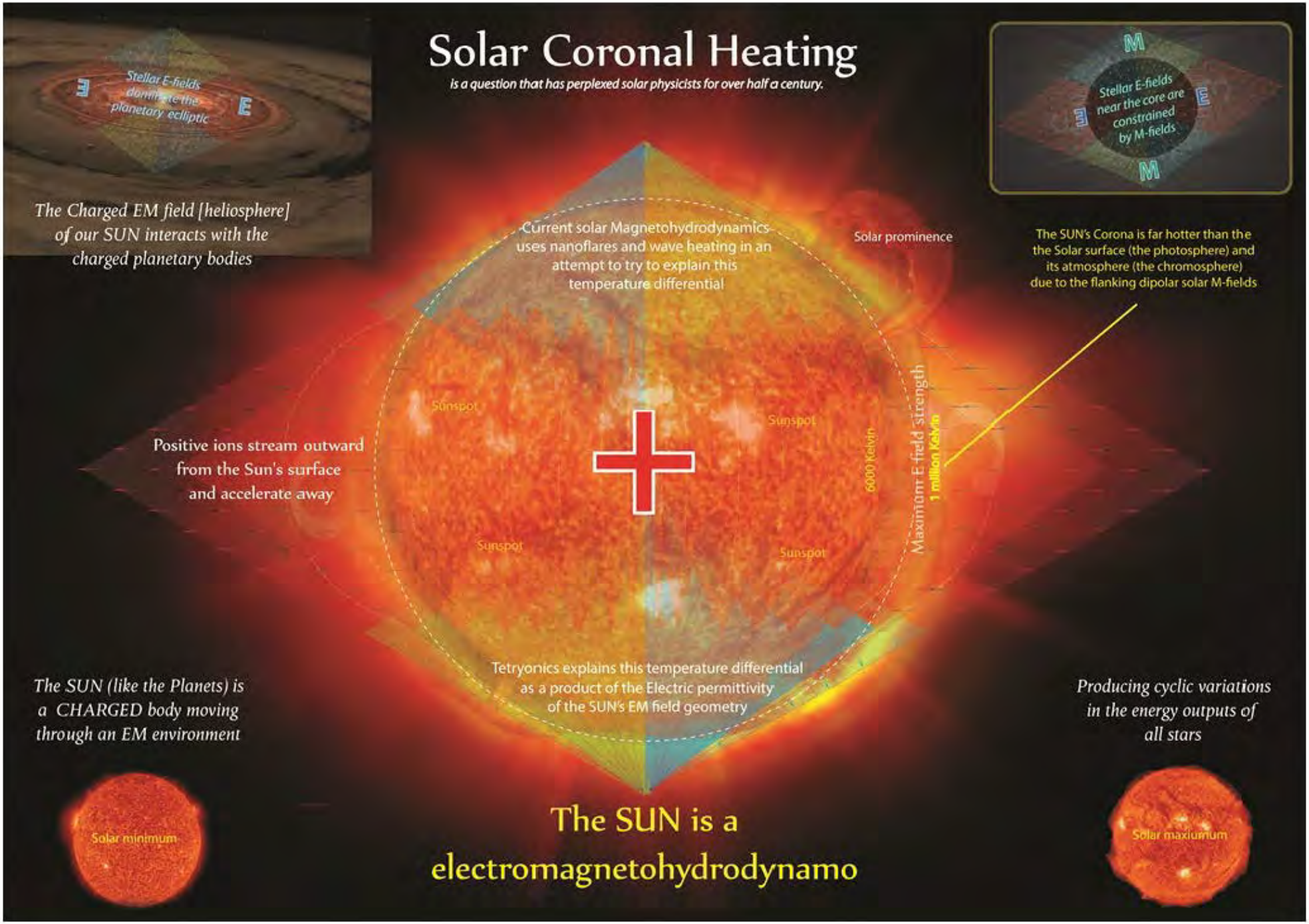
Solar Coronal Heating
is a question that has perplexed solar physicists for over half a century.
Stellar E-fields dominate the planetary ecliptic
E
The Charged EM field [heliosphere] of our SUN interacts with the charged planetary bodies
M
Stellar E-fields near the core are constrained by M-fields
E
E
M
Current solar Magnetohydrodynamics uses nanoflares and wave heating in an attempt to try to explain this temperature differential
Solar prominence
The SUN's Corona is far hotter than the the Solar surface (the photosphere) and its atmosphere (the chromosphere) due to the flanking dipolar solar M-fields
Positive ions stream outward from the Sun's surface and accelerate away
Sunspot
Sunspot
Sunspot
Sunspot
6000 Kelvin
Maximum E-field strength
1 million KeV/m
Tetryonics explains this temperature differential as a product of the Electric permittivity of the SUN's EM field geometry
The SUN (like the Planets) is a CHARGED body moving through an EM environment
Producing cyclic variations in the energy outputs of all stars
Solar minimum
Solar maximum
The SUN is a electromagnetohydrodynamo

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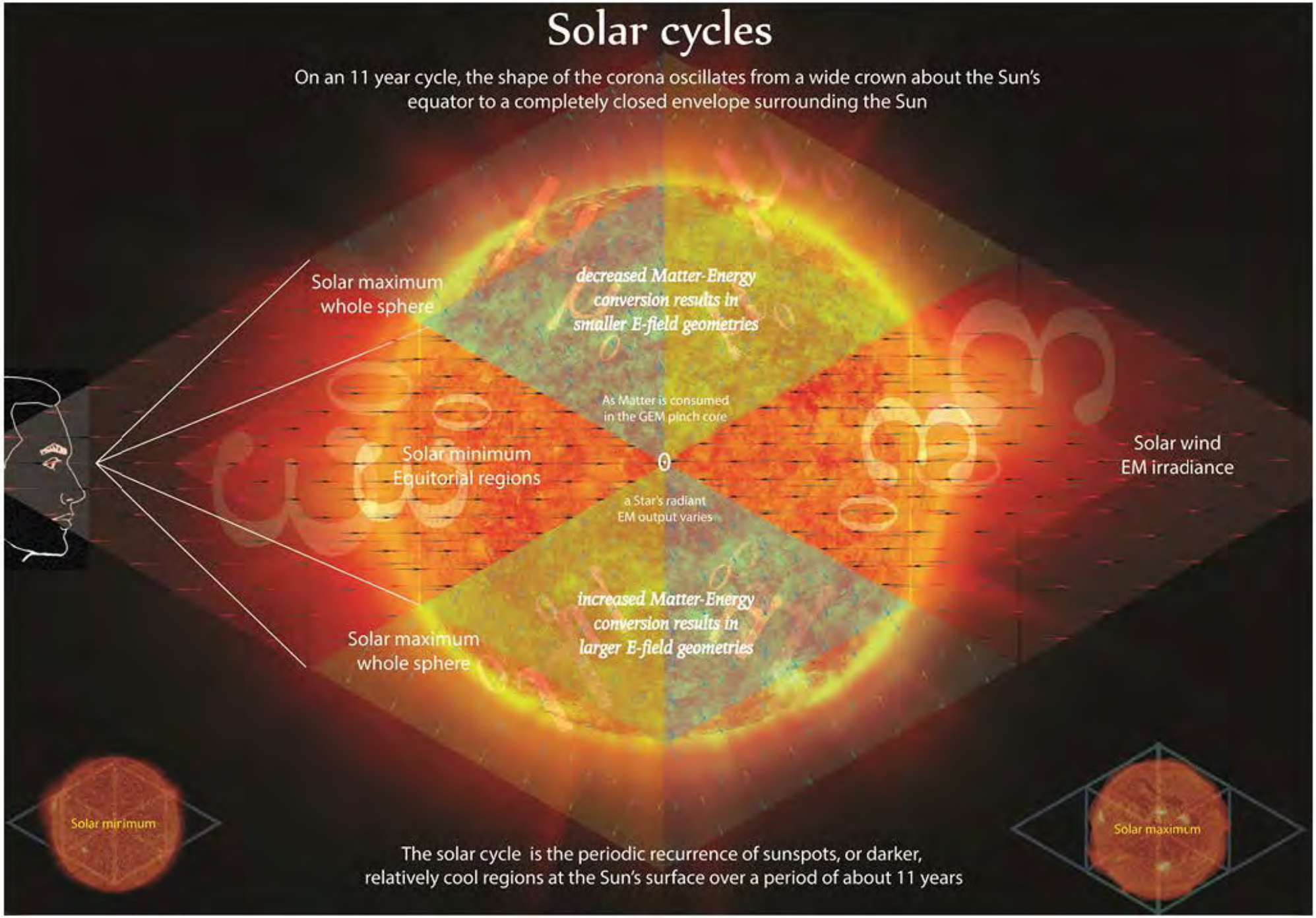
Solar cycles
On an 11 year cycle, the shape of the corona oscillates from a wide crown about the Sun's equator to a completely closed envelope surrounding the Sun
Solar maximum whole sphere
decreased Matter-Energy conversion results in smaller E-field geometries
As Matter is consumed in the GEM pinch core
Solar minimum Equitorial regions
0
a Star's radiant EM output varies
Solar wind EM irradiance
increased Matter-Energy conversion results in larger E-field geometries
Solar maximum whole sphere
Solar minimum
Solar maximum
The solar cycle is the periodic recurrence of sunspots, or darker, relatively cool regions at the Sun's surface over a period of about 11 years

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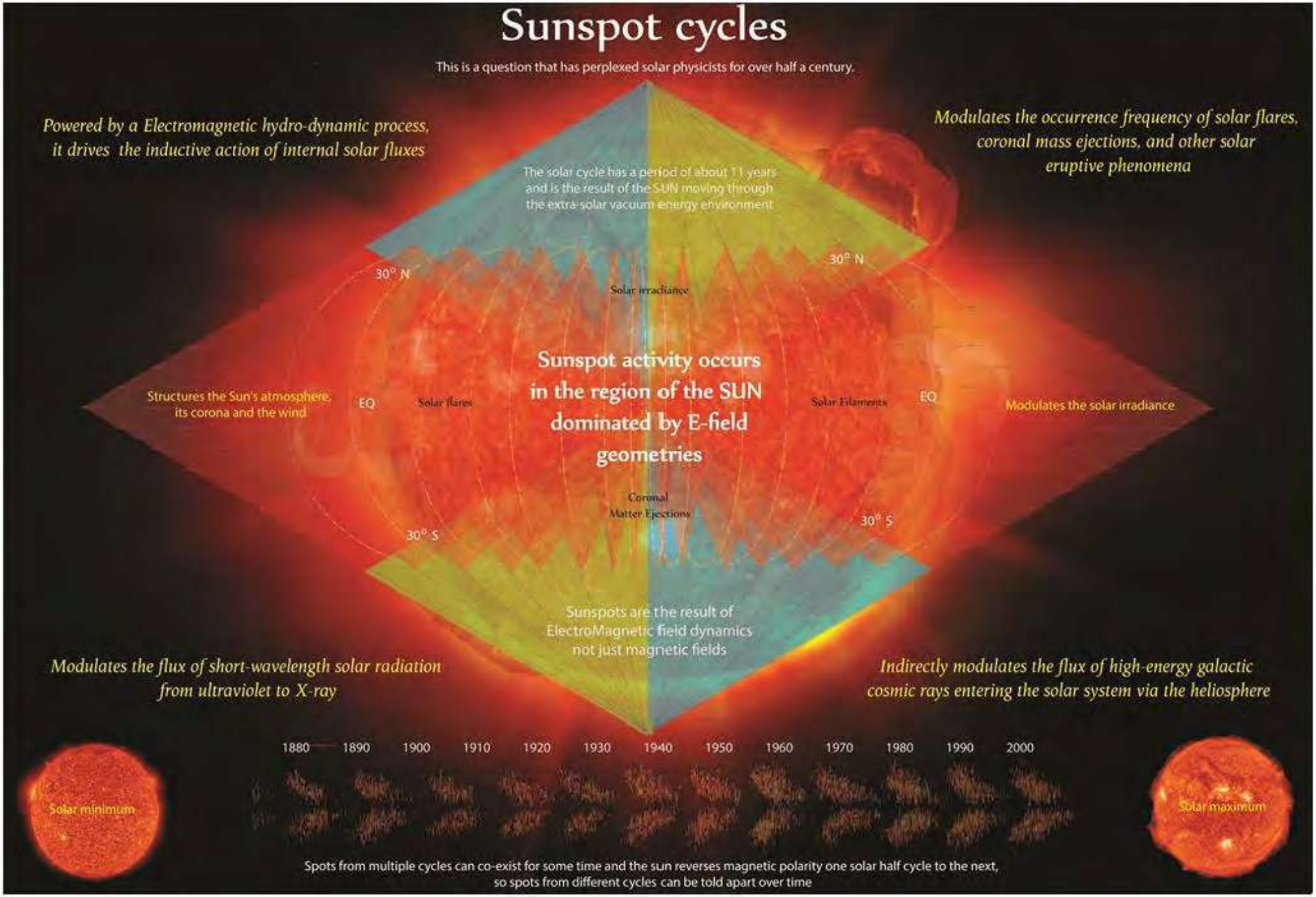
Sunspot cycles
This is a question that has perplexed solar physicists for over half a century.
Powered by a Electromagnetic hydro-dynamic process, it drives the inductive action of internal solar fluxes
Modulates the occurrence frequency of solar flares, coronal mass ejections, and other solar eruptive phenomena
The solar cycle has a period of about 11 years and is the result of the SUN moving through the extra-solar vacuum energy environment
30° N
30° N
Solar irradiance
Sunspot activity occurs in the region of the SUN dominated by E-field geometries
Structures the Sun's atmosphere, its corona and the wind
EQ
Solar flares
Solar Filaments
EQ
Modulates the solar irradiance
Coronal Matter Ejections
30° S
30° S
Sunspots are the result of ElectroMagnetic field dynamics not just magnetic fields
Modulates the flux of short-wavelength solar radiation from ultraviolet to X-ray
Indirectly modulates the flux of high-energy galactic cosmic rays entering the solar system via the heliosphere
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Solar minimum
Solar maximum
Spots from multiple cycles can co-exist for some time and the sun reverses magnetic polarity one solar half cycle to the next, so spots from different cycles can be told apart over time

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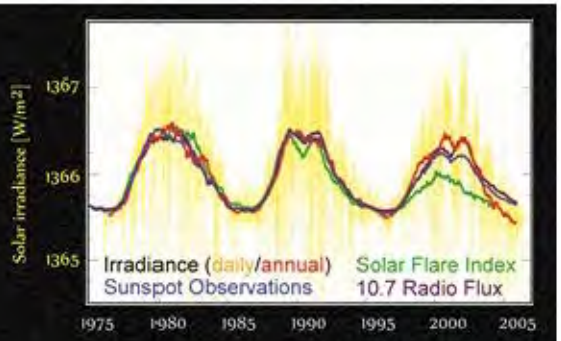
Solar irradiance



Solar EM mass-energy irradiation

is a measure of the total incident levels of solar EM radiation recieved by the Earth's upper atmosphere in a given unit of time.

It is not the same as measuring the amount of EM radiation emitted from the surface of the SUN.

It can be stated that solar irradiation is the amount of EM energy transmitted from the SUN to the Earth's outer atmosphere.

This measurement is normally done in square units per units of time.

Solar irradiance [W/m²]

The set amount of solar energy recieved by the Earth's atmosphere is called the solar constant.

The most recent value measured for the Solar Constant is 1368 Watts per meter squared.

The Solar constant has an inverse relationship to the solar irradiance of the SUN's surface reflective of Earth's distance from the SUN.

It shows how the massive amouts of EM energies emitted by the sun is scaled down to what is used by every biosystem on the planet.

The SUN is an ElectroMagnetic pinch reactor

The Sun emits longitudinal EM radiation across most of the electromagnetic spectrum.

The basic causes of the solar variability and solar cycles are still under debate, Tetryonics dictates a EM mechanism for the energies produced at the core of Stars and that the variability of the stellar outputs may be due to changes in the ElectroMagnetic environment that Stars [and their planetary systems] move through

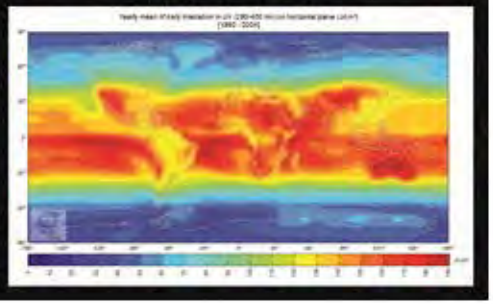
The spectrum of the Sun's solar radiation is close to that of a black body with a temperature of about 5,800 K.

Solar irradiation produces Carbon 14

An extremely long stretch of low activity in recent years has left scientists baffled and searching for a better model of the SUN's interal processes and how to forcast its output in order to establish a better link between the solar cycle and global climate flucuations

The total solar irradiance (TSI) is the amount of solar radiative energy incident on the Earth's upper atmosphere

Changes in the SUN's EM output can have a direct effect on the weather and electrical activity of the Earth and other planets



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Stellar refraction of EM waves

Any test of General Relativity using photons (or EM waves) will only measure SR interactions
[ie Gravitational red-shifting is a SR effect on EM masses not graviational Matter]

G

The motion of Matter is affected by gravitational attraction and EM interactions

EM

The motion of EM masses is affected by EM interactions and creates refraction

Photons are NOT 'bent' by Gravitational fields
they are refracted by propagation velocity changes
resulting from their EM interactions
with the solar corona

$$\alpha[\text{einstein}] = \frac{8\pi GM}{c^2}$$

According to Einstein's general theory of relativity published in 1916, light coming from a star far away from the Earth and passing near the Sun will be deflected by the Sun's gravitational field by an amount that is inversely proportional to the star's radial distance from the Sun.

1.745" at the Sun's limb
(this is the result of EM refraction NOT Matter gravitation)

$$\alpha[\text{newton}] = \frac{4\pi GM}{r}$$

Photons are not massless they are 2D radiant EM mass-energy momenta geometries

r

The additional 'bending' of light rays as they pass by a Gravitational body as predicited in Einstein's general relativity is caused by refractive EM interactions not by the force of gravity

4π 4π

c^2

Gravitation in General relativity is Newton's Gravity with SR corrections

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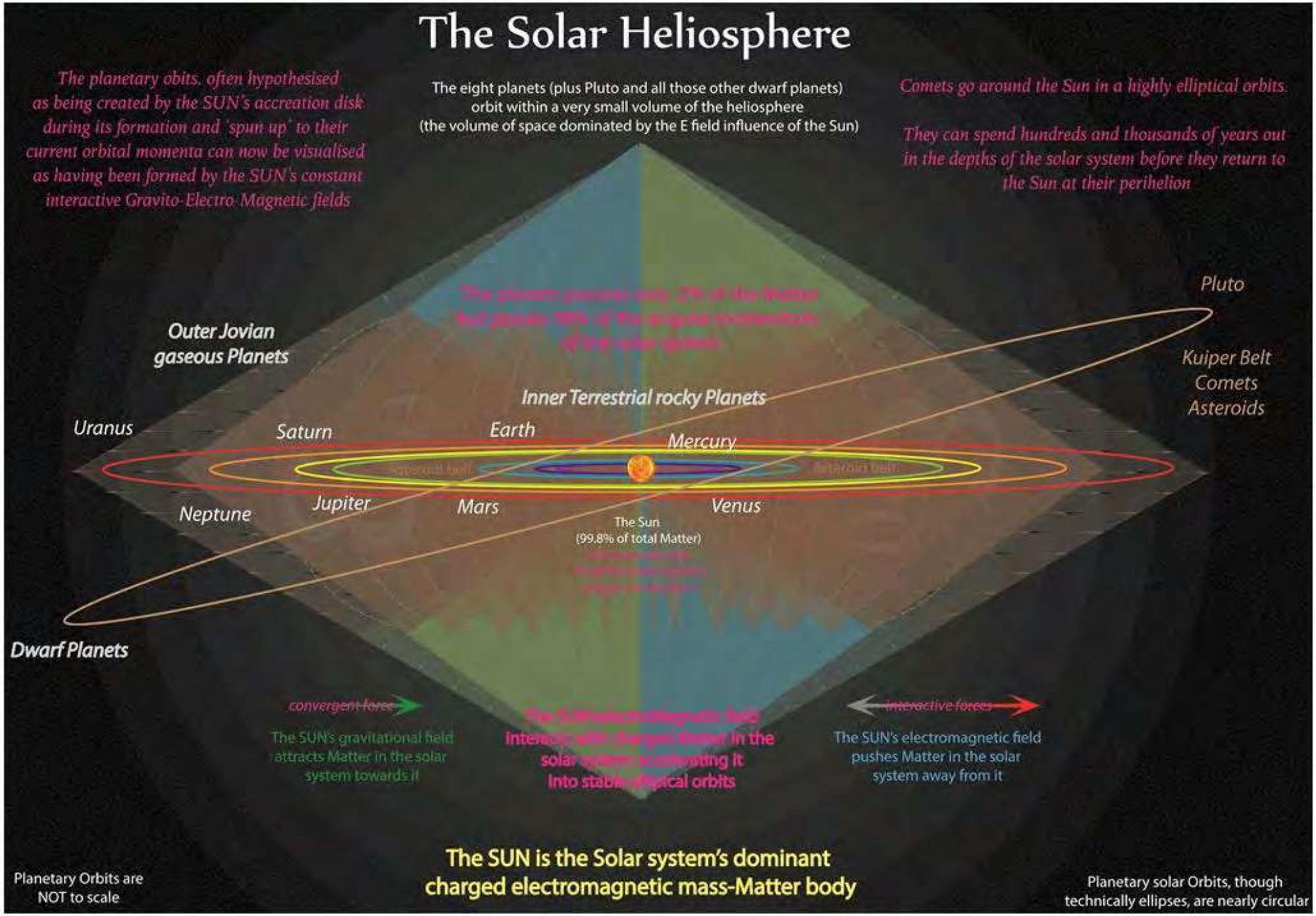
The Solar Heliosphere
The planetary obits, often hypothesised as being created by the SUN's accreation disk during its formation and 'spun up' to their current orbital momenta can now be visualised as having been formed by the SUN's constant interactive Gravito-Electro-Magnetic fields
The eight planets (plus Pluto and all those other dwarf planets) orbit within a very small volume of the heliosphere (the volume of space dominated by the E field influence of the Sun)
Comets go around the Sun in a highly elliptical orbits.
They can spend hundreds and thousands of years out in the depths of the solar system before they return to the Sun at their perihelion
Pluto
Outer Jovian gaseous Planets
Kuiper Belt
Comets
Asteroids
Inner Terrestrial rocky Planets
Uranus
Saturn
Earth
Mercury
Neptune
Jupiter
Mars
Venus
The Sun
(99.8% of total Matter)
Dwarf Planets
convergent force
The SUN's gravitational field attracts Matter in the solar system towards it
interactive forces
The SUN's electromagnetic field pushes Matter in the solar system away from it
The SUN is the Solar system's dominant charged electromagnetic mass-Matter body
Planetary Orbits are NOT to scale
Planetary solar Orbits, though technically ellipses, are nearly circular

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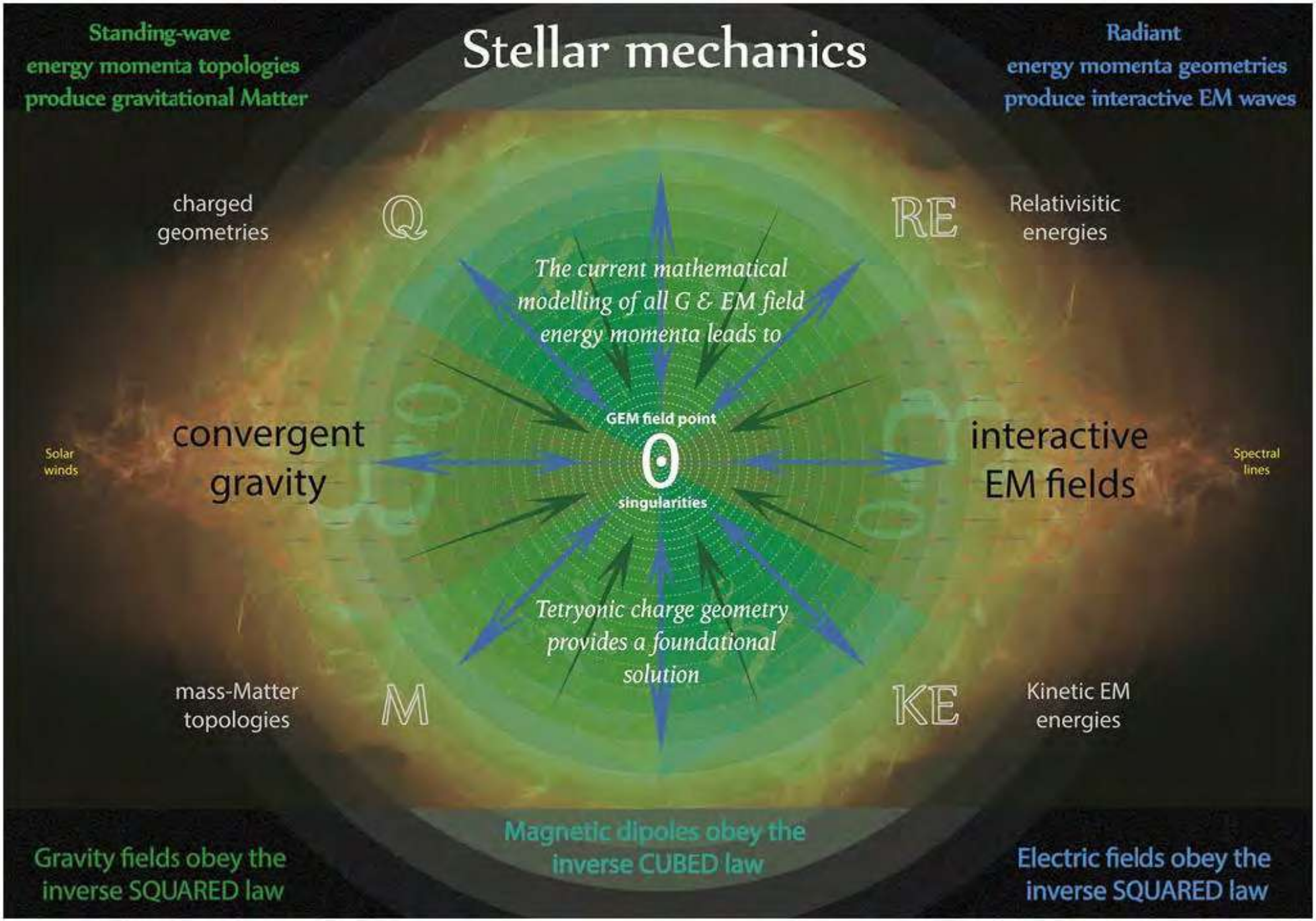

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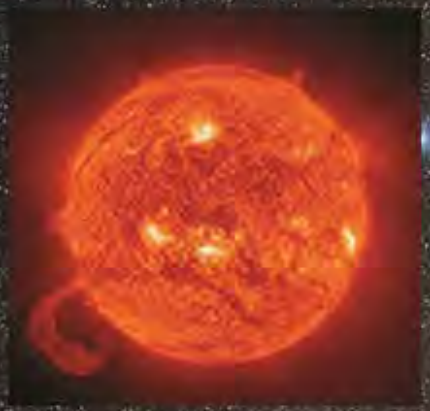
Anti-Matter Stars



$\bar{N}^0 = dud$

anti-Neutron — 18-18

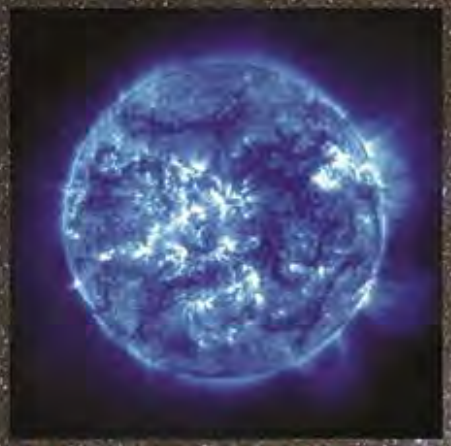
positron — 12-0 — [42-42]

Negatron — 12-24

$P^- = udu$

anti-Matter stars have the opposite charge topology to Matter stars

Neutron Stars



Colours used are illustrative of Matter types only

$N^0 = dud$

Neutron — 18-18

neutrino — 6-6 — [42-42]

anti-Neutron — 18-18

$\bar{N}^0 = dud$

All stars types emit Neutral Photons

Matter Stars

$N^0 = dud$

18-18 — Neutron

[42-42] — 0-12 — electron

24-12 — Proton

$P^+ = udu$

Matter stars have the opposite charge topology to anti-Matter stars

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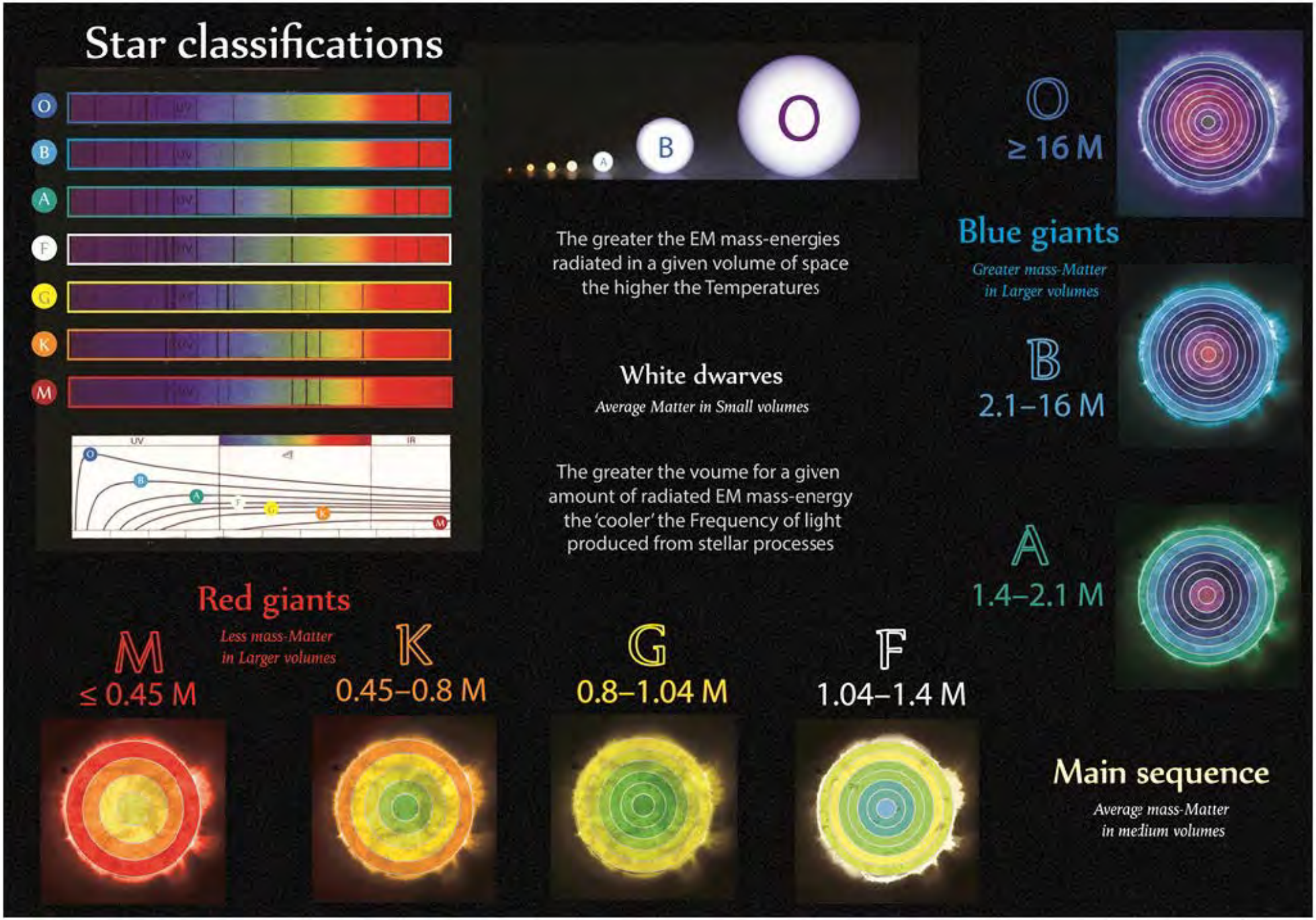

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Nucleosynthesis

The goal of nucleosynthesis is to understand the vastly differing abundances of the chemical elements and their several isotopes as being a result of natural history

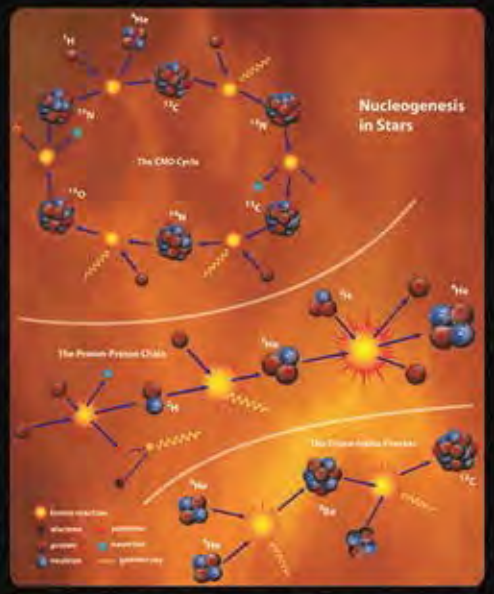
Nucleosynthesis is the process of creating new atomic nuclei from pre-existing nucleons (protons and neutrons)

All Stars have a dominant spectral colour and emit a multitude of spectral lines

All Stars emit various colour spectra that combine to form spectral lines reflective of the star's energy output

The CNO cycle describing element creation inside Stars is erroneous .....

All spectral lines can be produced by the excitation of stellar nuclei by photons released by GEM pinch Matter-Energy conversion



Elements in the Sun

Element	% of total atoms	% of total mass
Hydrogen	91.2	71.0
Helium	8.7	27.1
Oxygen	0.078	0.97
Carbon	0.043	0.40
Nitrogen	0.0088	0.096
Silicon	0.0045	0.099
Magnesium	0.0038	0.076
Neon	0.0035	0.058
Iron	0.030	0.014
Sulfur	0.015	0.040

In 1920, Arthur Eddington was the first to suggest that stars obtained their energy from nuclear fusion of hydrogen to form helium.

The P-P Chain describing the FUSION of elements to release energy is erroneous .....

All Matter-Energy conversion inside Stars is the result of ElectroMagnetic Pinches

Nucleosynthesis problems such as the abundances of observed elements & low mass element synthesis remain open problems for the current theory

Despite intense efforts to create suitable conditions, FUSION as described in nuclear theory, remains an ellusive source of Energy

The CNO cycle and P-P reactions are incorrect theorical models, developed to explain the SUN's GEM pinch dynamics and broad spectral line emissions

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Solar Arc lamp spectra

spectral lines are produced by accelerating electrons

Energy-momentum relationship

$$E = mv^2$$

Q

RE

M

KE

Elemental Spectra

Stellar core

1 2 3 4 5 6 7 8 9 Ni Fe Si Mg O N C He H

Quantum Energy levels [layers]

Spectral line transitions

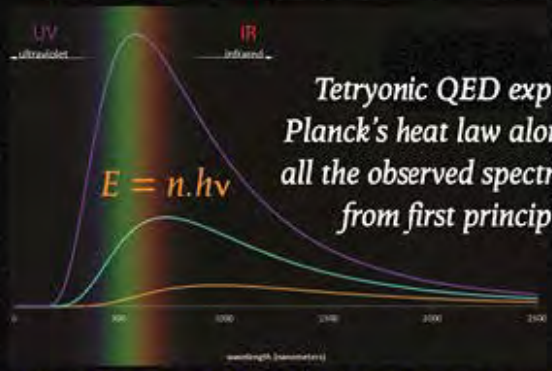
hν, R, β, ρ, KE
Planck, Rydberg, Lorentz, Newton, Leibniz

Spectral lines

KEM	
48	Lyman
108	Balmer
192	Paschen
300	Brackett
432	Pfund
588	Humphries
768	un-named

classical physics and relativity united through equilateral geometry

Astrophysicists and astronomers use arc lamps as spectral line reference sources for many elemental emission and absorption lines



Tetryonic QED explains Planck's heat law along with all the observed spectral lines from first principles

Planck's quantum radiation Law gives a energy distribution that peaks at a certain wavelength, Wien's Law explains the peak shifts to shorter wavelengths for higher temperatures, and the Stefan-Boltzman law explains the growth in the height [the area under] the curve with increasing temperatures

$$\Delta hf = \Delta Mv = \Delta p$$

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Stellar spectral lines

$E = Mc^4$

Energy-mass-Matter equivalence

Z#
All elements have equal number nuclei components [P-e-N]

Q

$\Delta mv = \Delta hf$
Excitation of photo-electrons in atomic nuclei produces spectral line emissions

RE

Quantum Energy levels [layers]

n

0

Elemental Spectra

M

KE

Energies released from the collapse of mass-Matter topologies in stellar cores is radiated as spectral mass-energies [GEM pinch]

mass-Energy equivalance

$E = mc^2$

The emissions from GEM pinch processes produce broad spectral lines that range from UV to IR rays *[& include white light]*

The spectral lines of all elements can be mimicked by Deuterium nuclei with rasied energy levels undergoing energy transitions

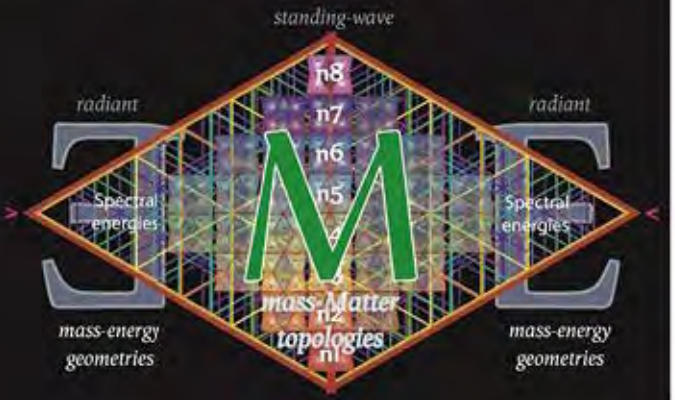
Tetryonic Electrodynamics

Δhv
Quantum differentials

$hf = \Delta Mv = \Delta p$

spectral lines are produced by accelerating electrons

As energy is 'released' by the collapse of mass-Matter topologies in the stellar core they radiate outward raising the nuclear energies of the surrounding Matter which in turn radiate spectral series photons



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Joseph von Fraunhofer

(6 March 1787 – 7 June 1826)

Annie Jump Cannon

(December 11, 1863 – April 13, 1941)

n1
standing-wave
n2
n3
n4
n5
n6
mass-Matter topologies
n7
n8

Quantum levels

Spectral energies

Stellar spectroscopy

Astronomical spectroscopy is the technique of spectroscopy used in astronomy.
The object of study is the spectrum of electromagnetic radiation, including visible light,
which radiates from stars and other celestial objects.

SPECTRAL SERIES

Lyman
Balmer
Paschen
Brackett
Pfund
Humphries

ATOMIC SHELLS

K
L
M
N
O
P

Spectral absorption lines
are often referred to
as Fraunhofer lines

QUANTUM LEVELS

In 1901 Annie Cannon improved
upon the 1897 work of Harvard
associate Antonia Maury to produce
the Harvard spectral class

STELLAR CLASSIFICATIONS

Spectroscopy can be used to derive many properties of distant stars and galaxies,
such as their chemical composition, and motion through Doppler shift measurements.

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mass-ENERGY-Matter

Energy from the SUN

EM energies released by the collapse of standing-wave Matter topologies in the SUN radiate through space as mass-energy momenta and interact with Matter

All atoms are comprised of Deuterium nuclei

Radiant electromagnetic waves propagate

at the speed of light in a vacuum [c]
taking 8.3 minutes to reach Earth

$$E = hf$$

X-rays, visible light, heat

GEM pinch core

E

ENERGY

MOMENTUM

action-at-a-distance

$$p = mc$$

Square root linear momenta present in all longitudinal EM waveforms from rigid rods

and once established propagate impulses of momenta near-instantaneously along the longitudinal waves arriving 8.3 minutes before visible light

Azmithal & Magnetic numbers
+3 +2 +1 0 -1 -2 -3
R Q P O N M L K
Shell
atomic shells
Quantum levels
8 7 6 5 4 3 2 1
Nuclei
2 8 18 32 18 8 2
Z
f d p s p d f
electron Orbitals & sub-orbitals

The Earth receives a broad spectrum of energies from the SUN
[with visible light falling into the Balmer spectral series]

$$hf = \underset{366.859\ nm}{kEM} = \frac{hcR}{n^2}$$

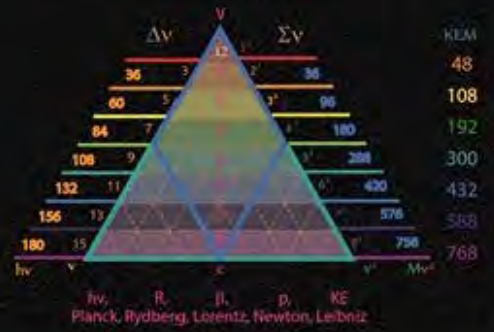
By inductively coupling to the raised quantum KEM fields of the bound electrons their energies can be extracted and utilised

Deuterium nuclei are quantum synchronous convertors of electromagnetic energies

$$kEM = Mv^2$$

As energy momenta is recieved the energy levels of the Baryons increases in turn affecting and raising the KEM field energies of bound electrons

spectral lines, atomic transitions, photo-electric effect



changing spectral emissions $\Delta hf = \Delta Mv = \Delta p$ accelerate photo-electrons

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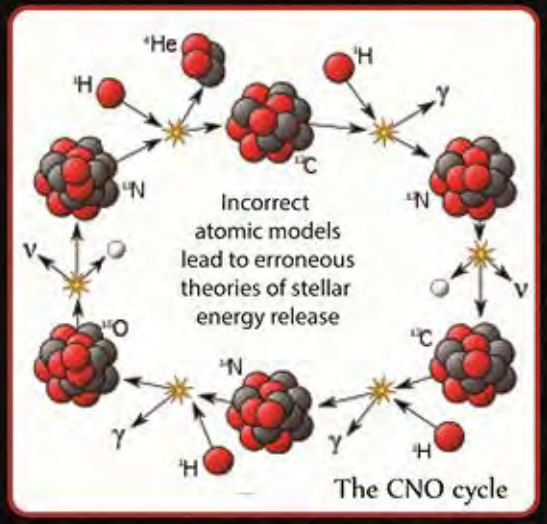
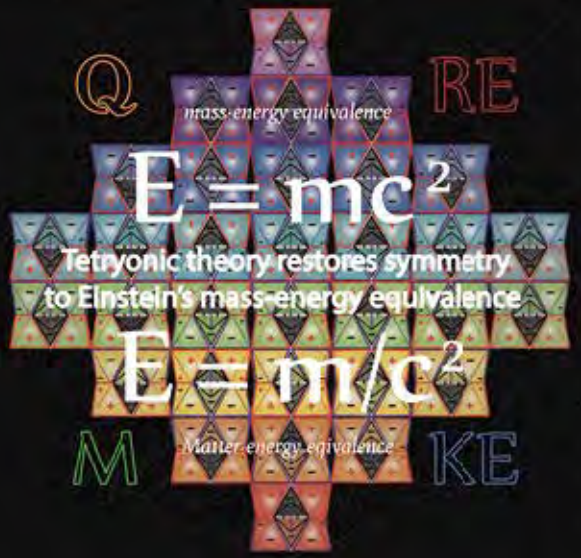
Stellar Energies





ENERGY

$$mc^2 = E = Mc^4$$

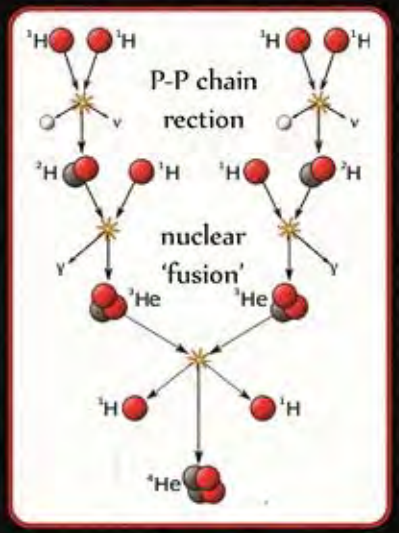
mass Matter

mass-ENERGY-Matter equivalence shows that a tiny amount of mass-Matter can be converted into a tremendous amount of radiant EM mass-energy

The energy released hypothesised by 'Fusion' is 1/200th that of the Tetryonic collapse of Matter into radiant EM mass-energies

All mass-ENERGY-Matter topologies are modelled in Tetryonic theory and Baryon decay is instigated by neutrinos

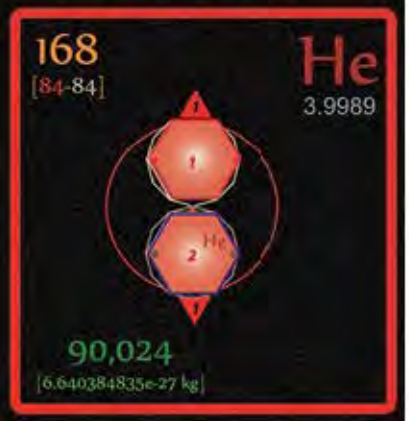
Neutrons are NOT Protons with an absorbed electron inside their charge topology



High pressure tunneling through the Coulomb barrier does NOT occur

The P-P fusion chain of Hydrogen->Helium is completely erroneous

The neutrino production of Proton-Proton chain reactions is 1/3 of what is detected



The SUN's energy comes from Tetryonic Matter collapse NOT the fusion of atomic nuclei

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Stellar Nuclear Fusion

is the process of fusing of light atomic nuclei in order to facilitate energy releases

Long sought after, but never realised, Fusion energies remain an ellusive source of clean limitless energy.

'COLD fusion'

can be realised through the fragmenting of large atomic nuclei thus releasing stored nuclear [K]EM waveform energies

The much-maligned 'COLD fusion' of Palladium is in fact a form of atomic fission that releases the stored chemical [kEM] energies of atomic nuclei and is 12-13% efficient

Tetryonics reveals the true mechanics behind the cold 'fusion' observed by Drs. Pons & Fleischmann and corrects the model of stellar processes to reveal new energy sources for the future

'HOT fusion'

is a fallacy, Stars release energy by collapsing standing-wave Matter into radiant EM mass-energy geometries in electromagnetic pinches

The hypothesised 'HOT fusion' of elements in stars is the Tetryonic conversion of mass-Matter within the star into radiant mass-energies requiring an electromagnetic pinch reaction but is 100% efficient

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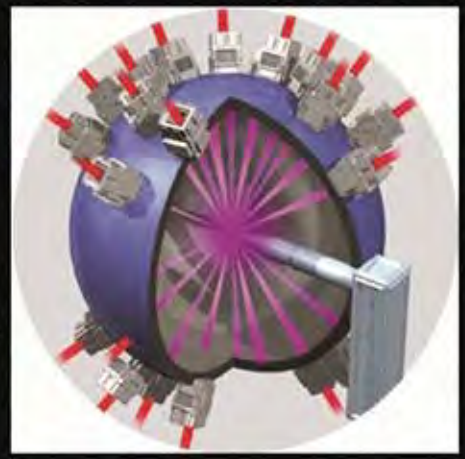
Where Fusion went Wrong

The conversion of standing-wave Matter into radiant mass-energy constitutes a sustainable, virtually unlimited environmentally compatible long-term source of energy that can meet all of Humanity's needs.

The toriodal design of Tokamak reactors does not allow for the formation of plasma pinches at their cores

Inertial confinement fusion produces brief shockwaves, excessive heating and no sustained EM field



Of the two designs only inertial confinement offered the best chance of creating the conditions required to effectively collapse Matter topologies in order to release the EM energies it contains.

However a far superior approach would be the electromagnetic pinching of Matter (as present in all stellar cores)

Tokamak design

Among a small number of approaches, the concept of toroidal magnetic confinement of fusion plasmas has achieved the most impressive scientific and technical progress towards energy release by thermonuclear burn of deuterium-tritium fuels.

The plasma consists of charged nuclei and electrons, which move in tight spirals around the lines of force of strong magnetic fields.

The basic problems in attaining useful nuclear fusion conditions are

(1) to heat the gas to these very high temperatures and

(2) to confine a sufficient quantity of the reacting nuclei for a long enough time to permit the release of more energy than is needed to heat and confine the gas.

A subsequent major problem is the capture of this energy and its conversion to electrical energy for work

Inertial confinement

In inertia confinement the fuel—tritium or deuterium is contained within a tiny glass sphere that is then bombarded on several sides by a pulsed laser or heavy ion beam.

This causes an implosion of the glass sphere, setting off a thermonuclear reaction that ignites the fuel but offer no self-regualation and relase of radiant mass-energies.

E_{in}

In any useful fusion device, the energy output must exceed the energy required to confine and heat the plasma

E_{out}

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ElectroMagnetic Pinch technology

can serve as the gateway to realising new forms of clean, safe, efficient Energy production through the conversion of any Matter into various forms of EM radiation utilising electromagnetic pinch geometries developed from Tetryonic theory

mass-Matter-ENERGY conversion

$$Mc^2 = E = hv^2$$

is the collapse of mass-Matter topoplogies into radiant mass-energy geometries

Charged Matter topologies are standing wave EM mass-energies

Radiant mass-energies form kEM wave geometries

An electromagnetic pulse (sometimes abbreviated EMP) is a burst of electromagnetic radiation that results from an explosion (usually from the detonation of a nuclear weapon) and/or a suddenly fluctuating magnetic field. The resulting rapidly changing electric fields or magnetic fields may couple with electrical/electronic systems to produce damaging current and voltage surges.

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Stellar GEM Pinches

The century old theoretical mechanism of FUSION from which the SUN generates its broad radiative EM energies must be replaced with Gravito-Electro-Magnetic pinches

M

Gravity fields obey the inverse SQUARE law

E

Electric fields obey the inverse SQUARE law

Polar Magnetic fields obey the inverse SQUARED law
Magnetic dipoles obey the inverse CUBED law

3D standing-wave topologies

$E = Mc^4$

Energy-mass-Matter equivalence

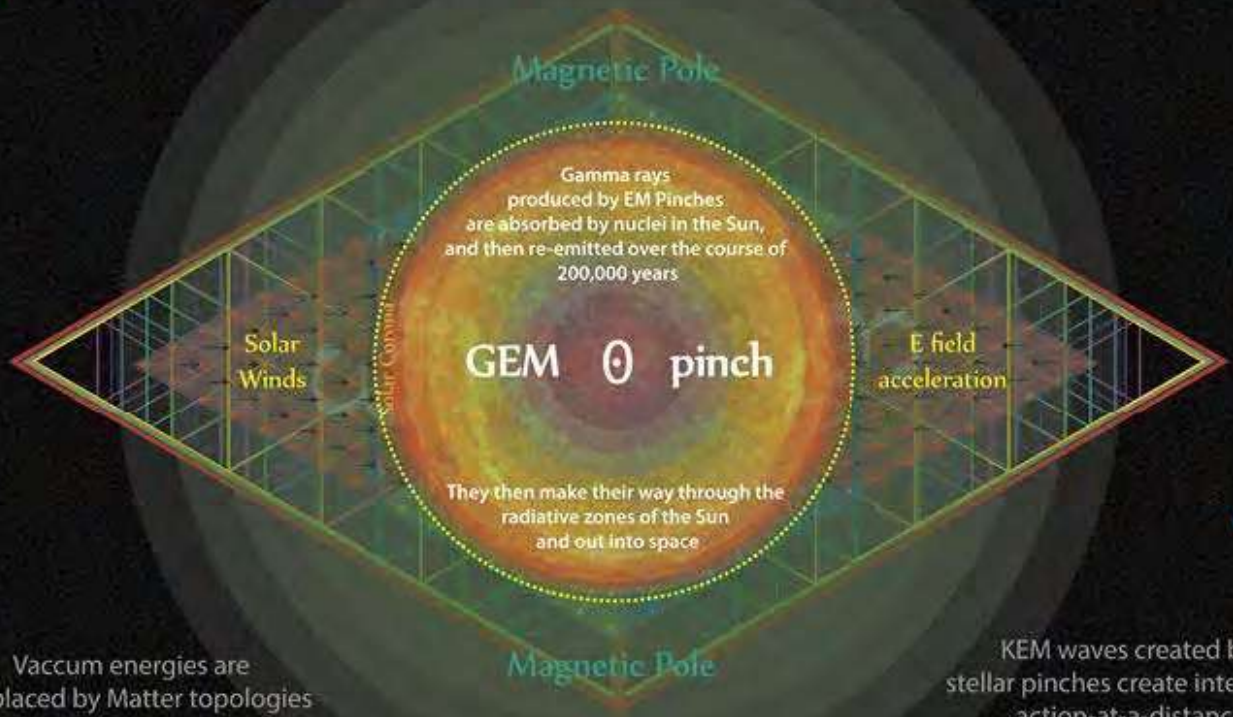
mass-Matter creates Gravity

2D radiant geometries

$E = mc^2$

mass-Energy equivalance

mass-energies create kEM fields


Magnetic Pole
Gamma rays produced by EM Pinches are absorbed by nuclei in the Sun, and then re-emitted over the course of 200,000 years
Solar Winds
GEM Θ pinch
E field acceleration
They then make their way through the radiative zones of the Sun and out into space
Magnetic Pole

Vaccum energies are displaced by Matter topologies to form convergent gravity

KEM waves created by stellar pinches create interactive action-at-a-distance

The conversion of Matter to Energy in stellar GEM pinches is 100% efficient

The Fusion of elements is NOT the energy source of Stars

mass-Matter-ENERGY conversion

Stars emit broad spectra LONGITUDINAL electromagnetic waves

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GEM Pinch efficiency

GEM Matter-Energy conversion is the 100% efficient dimensional transformation of 3D Matter into 2D mass-energy

M

Theorised Proton-Proton chain reactions of Stellar fusion release <1% of the total Matter as EM energies

3D mass-Matter topologies

c^4

m

Matter to energy conversion by EM pinches releases 100% of the total Tetryonic Matter as radiant EM mass-energies

2D mass-energy geometries

c^2

The collapse and conversion of 3D mass-Matter topologies into radiant mass-energies releases as much energy as

annihilation

12 [0-12]

dud

udu

n⁰ 0 [18-18]

p⁺ 12 [24-12]

12 [12-0] π⁺

0 [18-18] π⁰

12 [12-24] N

dud

udu

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EM Pinch reactors

The technology required to create clean, limitless energy and meet all of humanity's future energy requirements has existed since the 1900's.

The basic steps to build a EM Pinch reactor are

(1) design and build a EM pinch field into which a fuel pellet can be injected

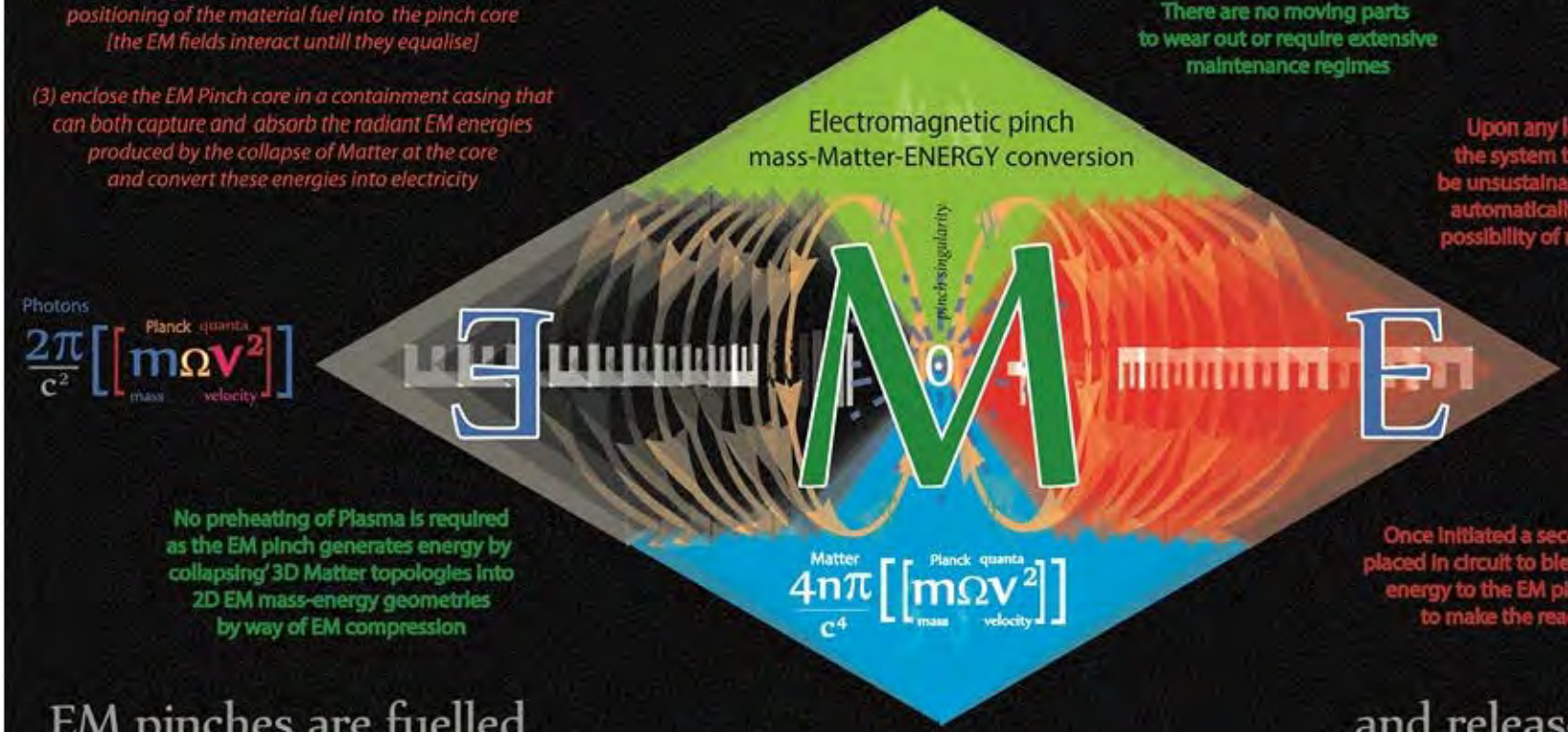
(2) the fuel can be any form of Matter that exhibits both Electric & Magnetic dipoles to facilitate the automatic positioning of the material fuel into the pinch core [the EM fields interact untill they equalise]

(3) enclose the EM Pinch core in a containment casing that can both capture and absorb the radiant EM energies produced by the collapse of Matter at the core and convert these energies into electricity

Th efficiency of the containment vessel along with energy storage and distribution can all be improved through the use of various Tetryonic field geometries to capture and re-circulate all EM energies produced

There are no moving parts to wear out or require extensive maintenance regimes

Upon any loss of Power to the system the EM pinch will be unsustainable and shutdown automatically preventing any possibility of runaway reactions



No preheating of Plasma is required as the EM pinch generates energy by collapsing' 3D Matter topologies into 2D EM mass-energy geometries by way of EM compression

Once initiated a secondary 'circuit' could be placed in circuit to bleed off and return suficient energy to the EM pinch field circuit in order to make the reaction self-sustaining

EM pinches are fuelled

by any form of Matter

The electromagnetic pinching of Matter (as utilised in Nature in all stellar cores) produces only EM radiation [light & heat] as a by-product - there are no harmful wastes - as the Matter is converted with 100% efficiency

and release mass-energy

as radiative KEM fields

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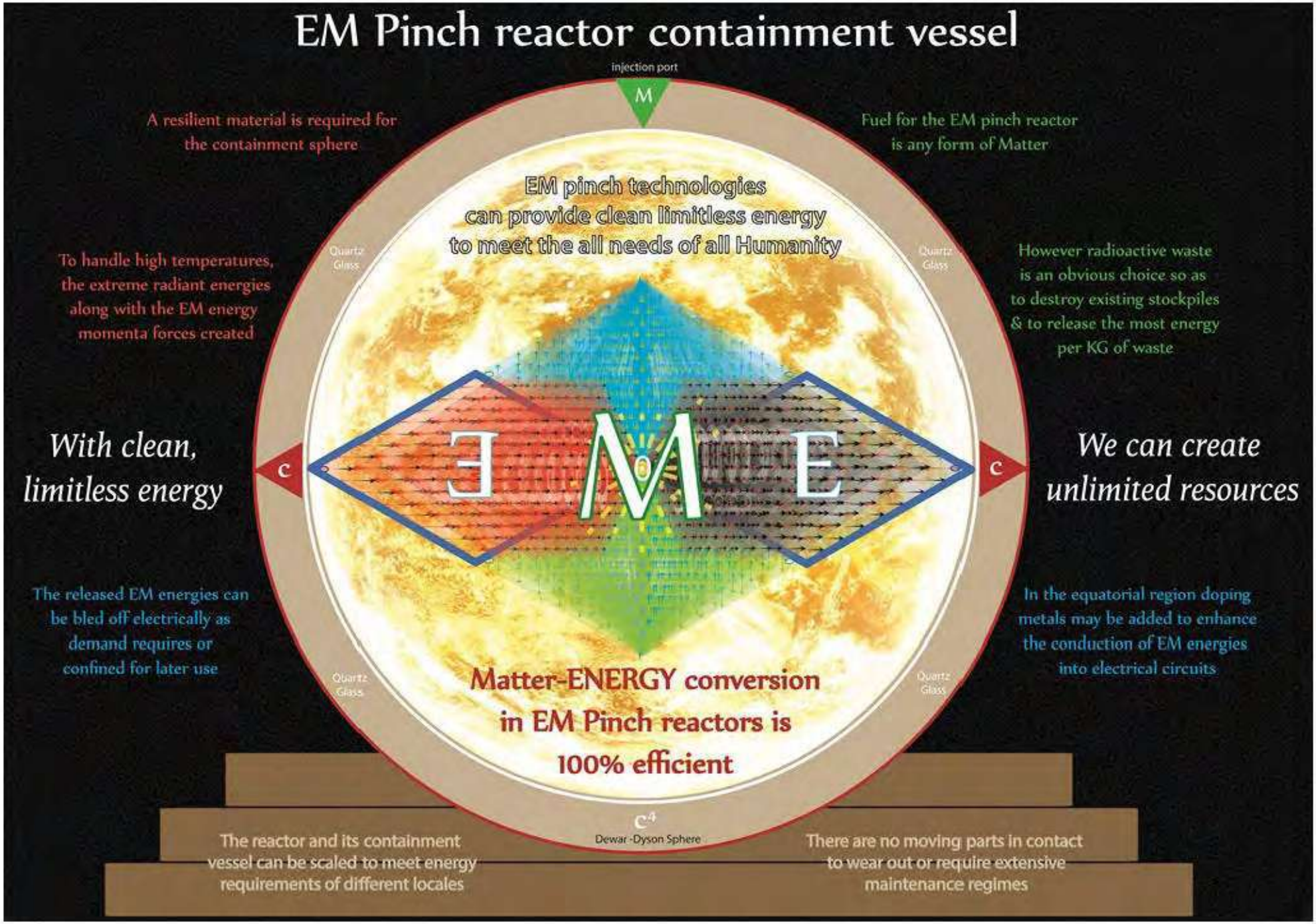
EM Pinch reactor containment vessel
injection port
M
A resilient material is required for the containment sphere
Fuel for the EM pinch reactor is any form of Matter
EM pinch technologies can provide clean limitless energy to meet the all needs of all Humanity
To handle high temperatures, the extreme radiant energies along with the EM energy momenta forces created
Quartz Glass
Quartz Glass
However radioactive waste is an obvious choice so as to destroy existing stockpiles & to release the most energy per KG of waste
With clean, limitless energy
c
E M E
c
We can create unlimited resources
The released EM energies can be bled off electrically as demand requires or confined for later use
In the equatorial region doping metals may be added to enhance the conduction of EM energies into electrical circuits
Quartz Glass
Quartz Glass
Matter-ENERGY conversion in EM Pinch reactors is 100% efficient
c4
Dewar -Dyson Sphere
The reactor and its containment vessel can be scaled to meet energy requirements of different locales
There are no moving parts in contact to wear out or require extensive maintenance regimes

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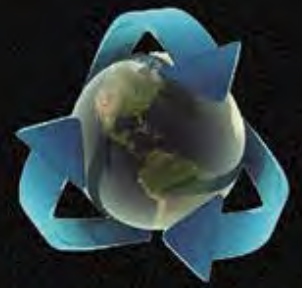
The Earth has finite resources and an ever increasing human population puts pressure on its ability to supply resources to meet our needs

Unlimited material Resources

With clean, limitless energy sources

Tetryonics offers a solution to human problems that have plagued civilization from its beginnings leading to wars, disease and famines



Unlimited resources can be created

mass-energy geometries
cannot be created or destroyed

mass-Matter topologies
can be created and destroyed

Resources

Health

With this new understanding of the charged mass-energy geometries of Matter excess energies generated from the destruction of Matter topologies can be reformed into any desired element or compound, and all harmful waste can be removed from our environment

Food

Water

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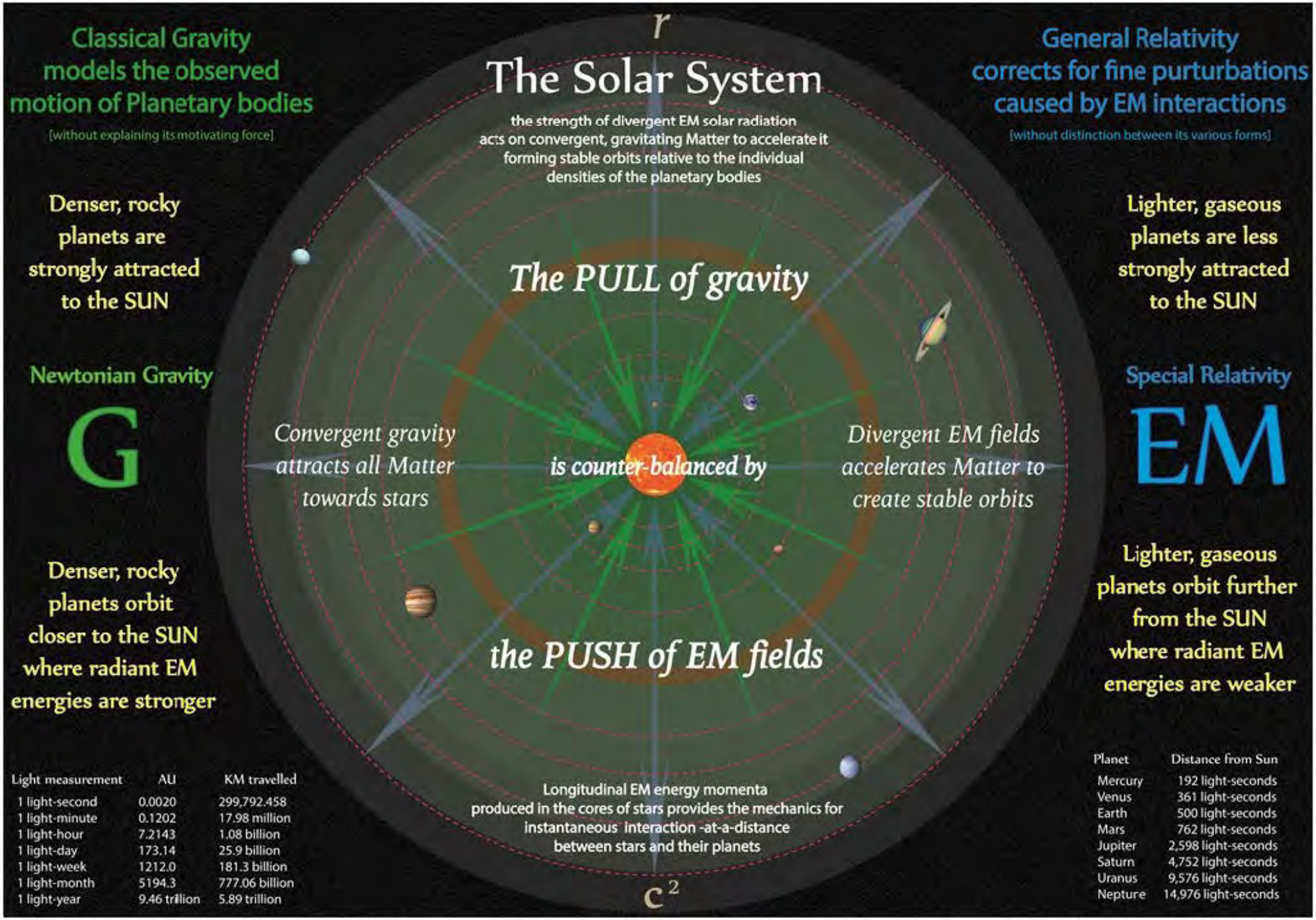

Light measurement	AU	KM travelled
1 light-second	0.0020	299,792.458
1 light-minute	0.1202	17.98 million
1 light-hour	7.2143	1.08 billion
1 light-day	173.14	25.9 billion
1 light-week	1212.0	181.3 billion
1 light-month	5194.3	777.06 billion
1 light-year	9.46 trillion	5.89 trillion

Planet	Distance from Sun
Mercury	192 light-seconds
Venus	361 light-seconds
Earth	500 light-seconds
Mars	762 light-seconds
Jupiter	2,598 light-seconds
Saturn	4,752 light-seconds
Uranus	9,576 light-seconds
Nepture	14,976 light-seconds

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Kepler's Laws

Kepler's three laws of planetary motion can be described as follows:

The path of the planets about the sun is elliptical in shape, with the center of the sun being located at one focus. (The Law of Ellipses)

An imaginary line drawn from the center of the sun to the center of the planet will sweep out equal areas in equal intervals of time. (The Law of Equal Areas)

The ratio of the squares of the periods of any two planets is equal to the ratio of the cubes of their average distances from the sun. (The Law of Harmonies).

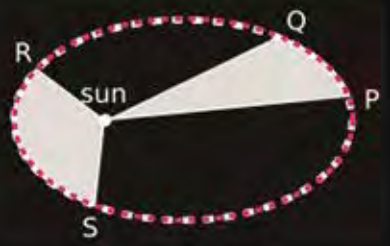
$$T^2 = k\, a^3$$

The square of the orbital period of a planet is directly proportional to the cube of the semi-major axis of its orbit.

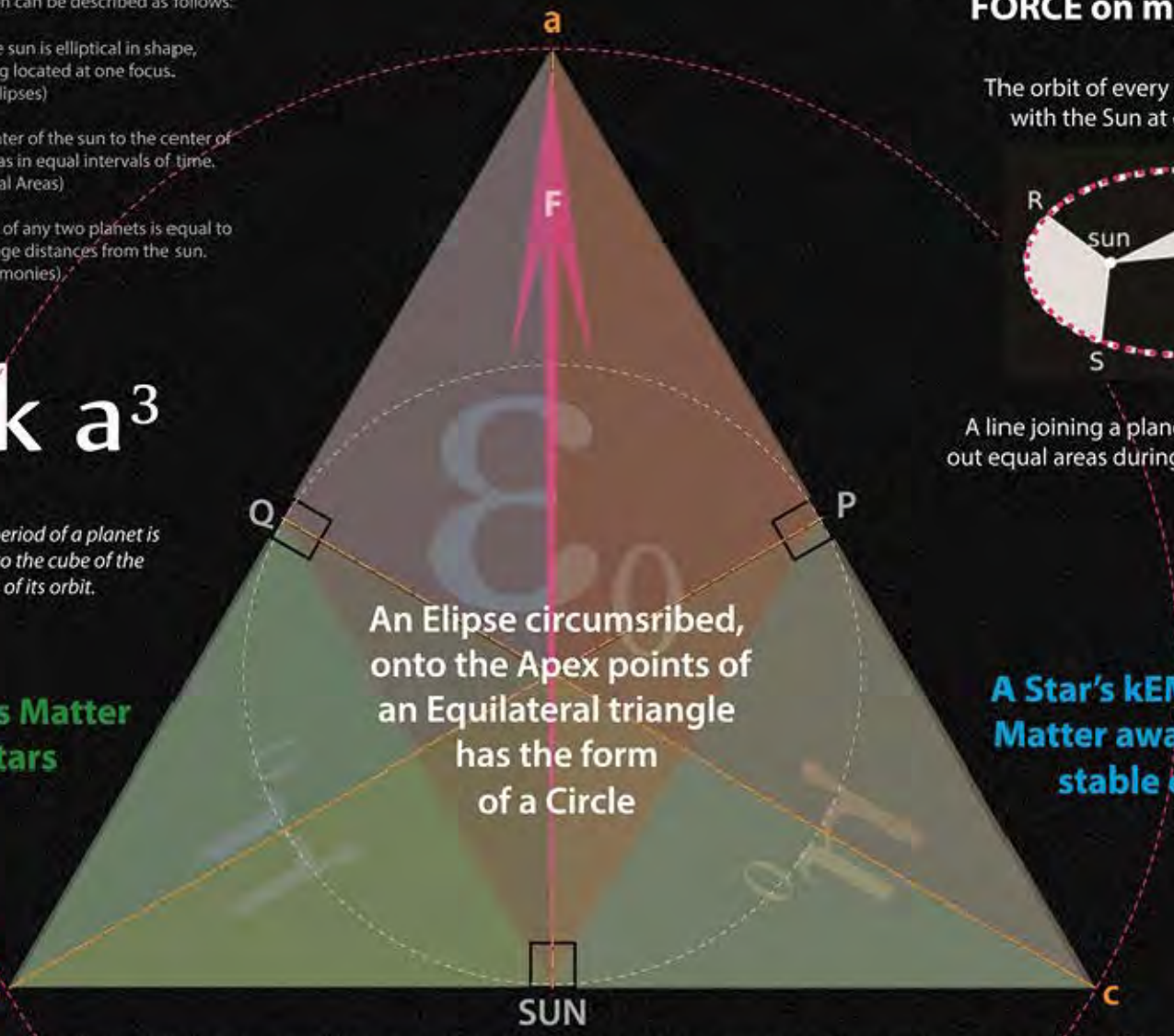
Gravity attracts Matter towards stars

The divergent energy momenta of kEM fields create an acceleration FORCE on material bodies

The orbit of every planet is an ellipse with the Sun at one of the two foci.



A line joining a planet and the Sun sweeps out equal areas during equal intervals of time.



An Elipse circumsribed, onto the Apex points of an Equilateral triangle has the form of a Circle

A Star's kEM field accelerates Matter away from it creating stable ellipical orbits

With an equilateral triangle, draw lines from the center of the circle to each vertex and each midpoint, creating six right triangles, as shown with six different colored triangles.
Each right triangle has a radius of the circle for one leg, and half of a side of the original triangle for another.
Any two right triangles sharing one of the radial lines must therefore be congruent, and that implies that the hypotenuses of the triangles are all equal.
This in turn shows that the six right triangles are all congruent, and so the large triangle they combine to form is equilateral

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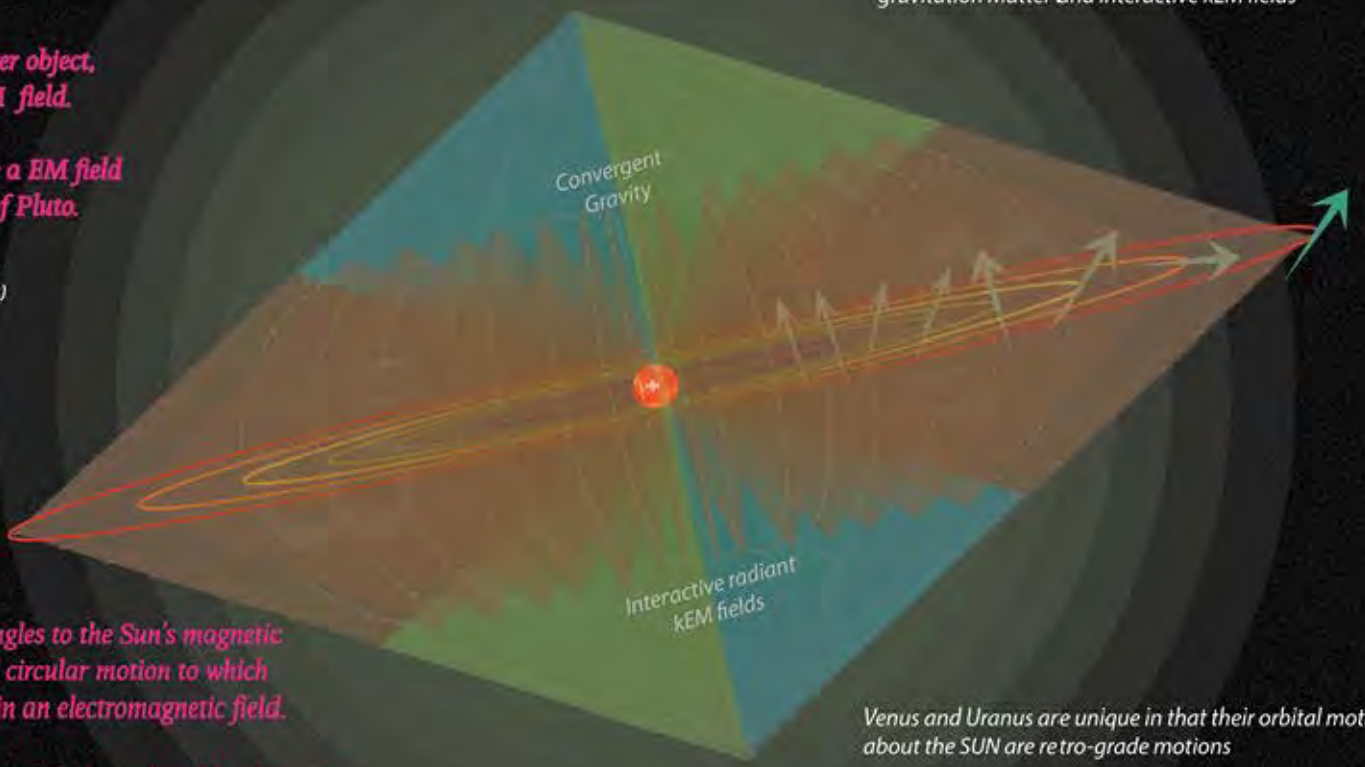
The Major celestial bodies

All planetary orbits are the result of a balance between gravitation Matter and interactive kEM fields

The sun is a rotating charged mass-Matter object, and it creates a solar system-wide kEM field.

The solar mass is large enough to produce a EM field with lines of Force reaching the orbit of Pluto.

Planet	Object Axial tilt (°)	Axial tilt (radians)
Mercury	~0.01	0.00
Venus	177.4	3.10
Earth	23.44	0.41
Moon	1.5424	0.03
Mars	25.19	0.44
Jupiter	3.13	0.06
Saturn	26.73	0.47
Uranus	97.77	1.71
Neptune	28.32	0.49
Pluto	119.61	2.09



The charged planets move at right angles to the Sun's magnetic lines of force and describe the usual circular motion to which moving charged bodies are subject to in an electromagnetic field.

Satellites, in turn, revolve in the smaller magnetic fields produced by the rotation of the planets. Mercury and Venus have no satellites as they produce extremely weak electromagnetic fields in addition to their Gravitational fields.

Venus and Uranus are unique in that their orbital motions about the SUN are retro-grade motions

"In comparing the masses of the Earth, Jupiter and Saturn to their volumes, one remarks that the densities of these planets are, to some degree, inverse to their mean distances from the Sun. This rule is not true for Venus and Uranus"

Urbain Le Verrier

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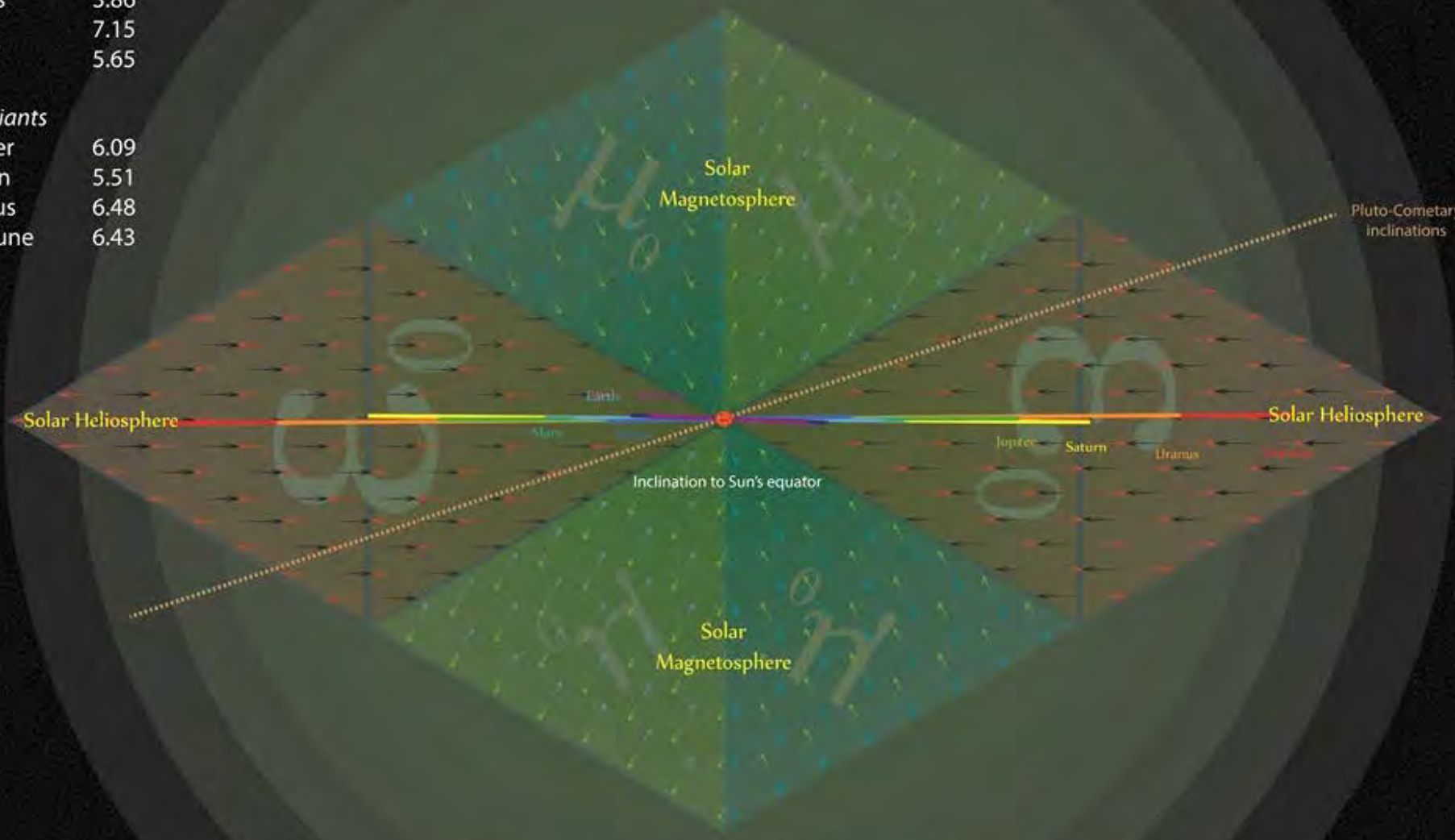
Solar orbit Inclinations

Inclination to Sun's equator (°)

Rocky Planets	
Mercury	3.38
Venus	3.86
Earth	7.15
Mars	5.65
Gas giants	
Jupiter	6.09
Saturn	5.51
Uranus	6.48
Neptune	6.43



Orbital inclination is one of the six orbital parameters describing the shape and orientation of a celestial orbit.

It is the angular distance of the orbital plane from the plane of reference (usually the primary's equator or the ecliptic), normally stated in degrees.

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The Lagrange Points

are the five positions in an orbital configuration where a small object affected only by gravity can be stationary relative to two larger material bodies of mass-Matter

Gravity is a strictly convergent Force

GR = G + EM

Einstein Newton Lorentz

General Relativity models Newtonian Gravity with SR interactions

GEM forces between two bodies can be modelled with super-positioned equilateral energy geometries

Gravitational forces from the two massive bodies are in the same ratio as the material masses of the two bodies

L4

Gravitational attraction of M partially cancels the gravity of m

L3

This point lies on the line defined by the two large masses, beyond the larger of the two

L1

L2

Gravitational forces of the two large masses balance the centrifugal effect on a body at L2.

M m

L5

L4 and L5 are sometimes called triangular Lagrange points or Trojan points after the Trojan ateroids found in the L4-L5 points of the Jupiter-Saturn system.

observed attractive force between Matter

The Lagrange points mark positions where the combined gravitational pull of the two large masses provides precisely the right centripetal force required to rotate with them

Lagrange found his points of stabilty by subtracting the gravitational potential energy from the object's kinetic energy.

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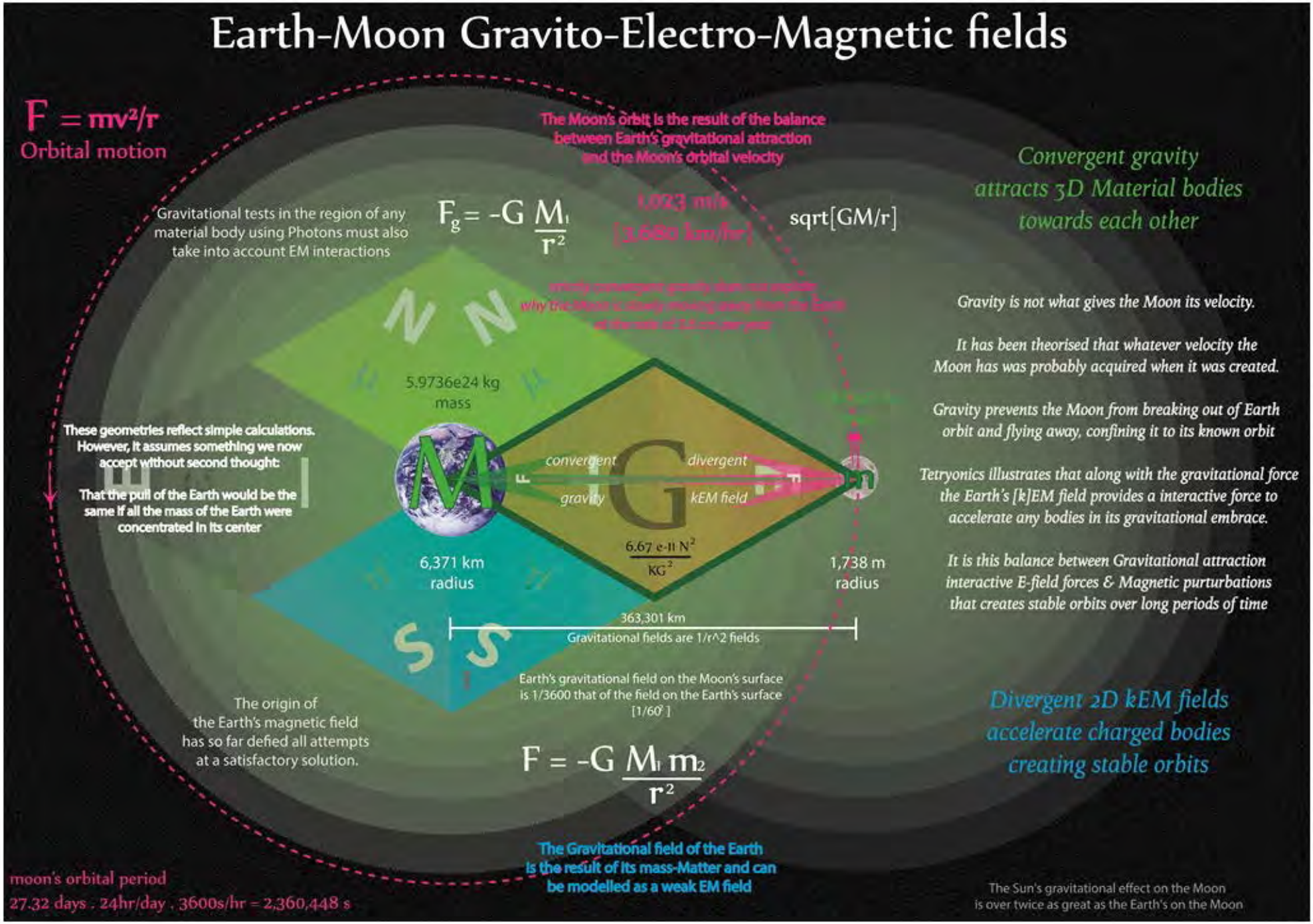
Earth-Moon Gravito-Electro-Magnetic fields
F = mv²/r
Orbital motion
The Moon's orbit is the result of the balance between Earth's gravitational attraction and the Moon's orbital velocity
Gravitational tests in the region of any material body using Photons must also take into account EM interactions
$F_g = -G \frac{M_1}{r^2}$
1,023 m/s
[3,680 km/hr]
sqrt[GM/r]
strictly convergent gravity does not explain why the Moon is slowly moving away from the Earth at the rate of 3.8 cm per year
Convergent gravity attracts 3D Material bodies towards each other
Gravity is not what gives the Moon its velocity.
It has been theorised that whatever velocity the Moon has was probably acquired when it was created.
Gravity prevents the Moon from breaking out of Earth orbit and flying away, confining it to its known orbit
Tetryonics illustrates that along with the gravitational force the Earth's [k]EM field provides a interactive force to accelerate any bodies in its gravitational embrace.
It is this balance between Gravitational attraction interactive E-field forces & Magnetic purturbations that creates stable orbits over long periods of time
5.9736e24 kg
mass
These geometries reflect simple calculations. However, it assumes something we now accept without second thought:
That the pull of the Earth would be the same if all the mass of the Earth were concentrated in its center
convergent
divergent
gravity
kEM field
6.67 e-11 N²/KG²
6,371 km
radius
1,738 m
radius
363,301 km
Gravitational fields are 1/r^2 fields
Earth's gravitational field on the Moon's surface is 1/3600 that of the field on the Earth's surface [1/60²]
The origin of the Earth's magnetic field has so far defied all attempts at a satisfactory solution.
$F = -G \frac{M_1 m_2}{r^2}$
Divergent 2D kEM fields accelerate charged bodies creating stable orbits
The Gravitational field of the Earth is the result of its mass-Matter and can be modelled as a weak EM field
moon's orbital period
27.32 days . 24hr/day . 3600s/hr = 2,360,448 s
The Sun's gravitational effect on the Moon is over twice as great as the Earth's on the Moon

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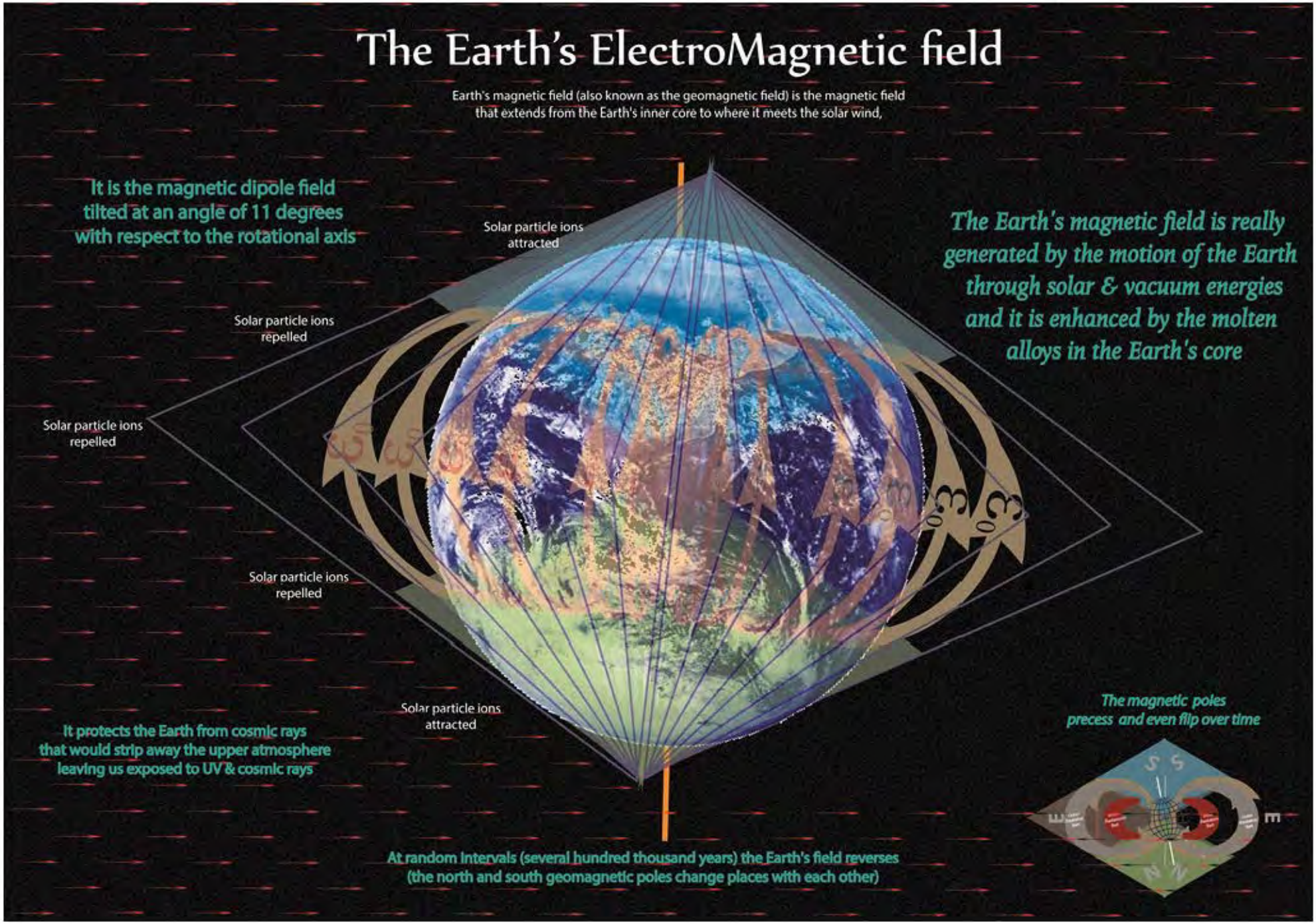
The Earth's ElectroMagnetic field
Earth's magnetic field (also known as the geomagnetic field) is the magnetic field that extends from the Earth's inner core to where it meets the solar wind,
It is the magnetic dipole field tilted at an angle of 11 degrees with respect to the rotational axis
Solar particle ions attracted
Solar particle ions repelled
Solar particle ions repelled
Solar particle ions repelled
Solar particle ions attracted
The Earth's magnetic field is really generated by the motion of the Earth through solar & vacuum energies and it is enhanced by the molten alloys in the Earth's core
The magnetic poles precess and even flip over time
It protects the Earth from cosmic rays that would strip away the upper atmosphere leaving us exposed to UV & cosmic rays
At random intervals (several hundred thousand years) the Earth's field reverses (the north and south geomagnetic poles change places with each other)

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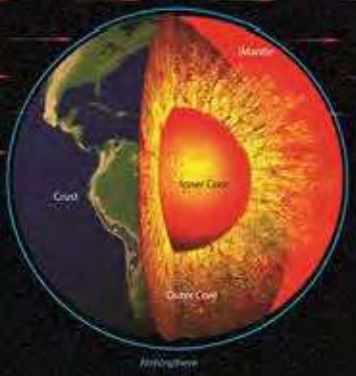
The Earth's molten core

The Earth has an outer silicate solid crust, a highly viscous mantle, a liquid outer core that is much less viscous than the mantle, and a solid inner core.
Scientific understanding of Earth's internal structure is based on observations of topography and bathymetry.



Q

The SUN and planetary bodies are all charged Matter moving in, displacing and interacting with solar and vacuum energies

Dynamo theory suggests that convection in the outer core, combined with the Coriolis effect, gives rise to Earth's magnetic field.

KE

The energy that creates the Earth's magnetic field is supplied by the SUN via longitudinal waves of energy momenta

The solid inner core is too hot to hold a permanent magnetic field but acts to stabilize the magnetic field generated by the Earth's motion through the Stellar EM environment as it orbits the SUN

The Earth's molten core does not produce the Earth's magnetic field it enhances it

The force exerted by Earth's gravity can be used to calculate its mass, and by estimating the volume of the planet, its average density can be calculated.

Astronomers can also calculate Earth's mass from its orbit and effects on nearby planetary bodies.

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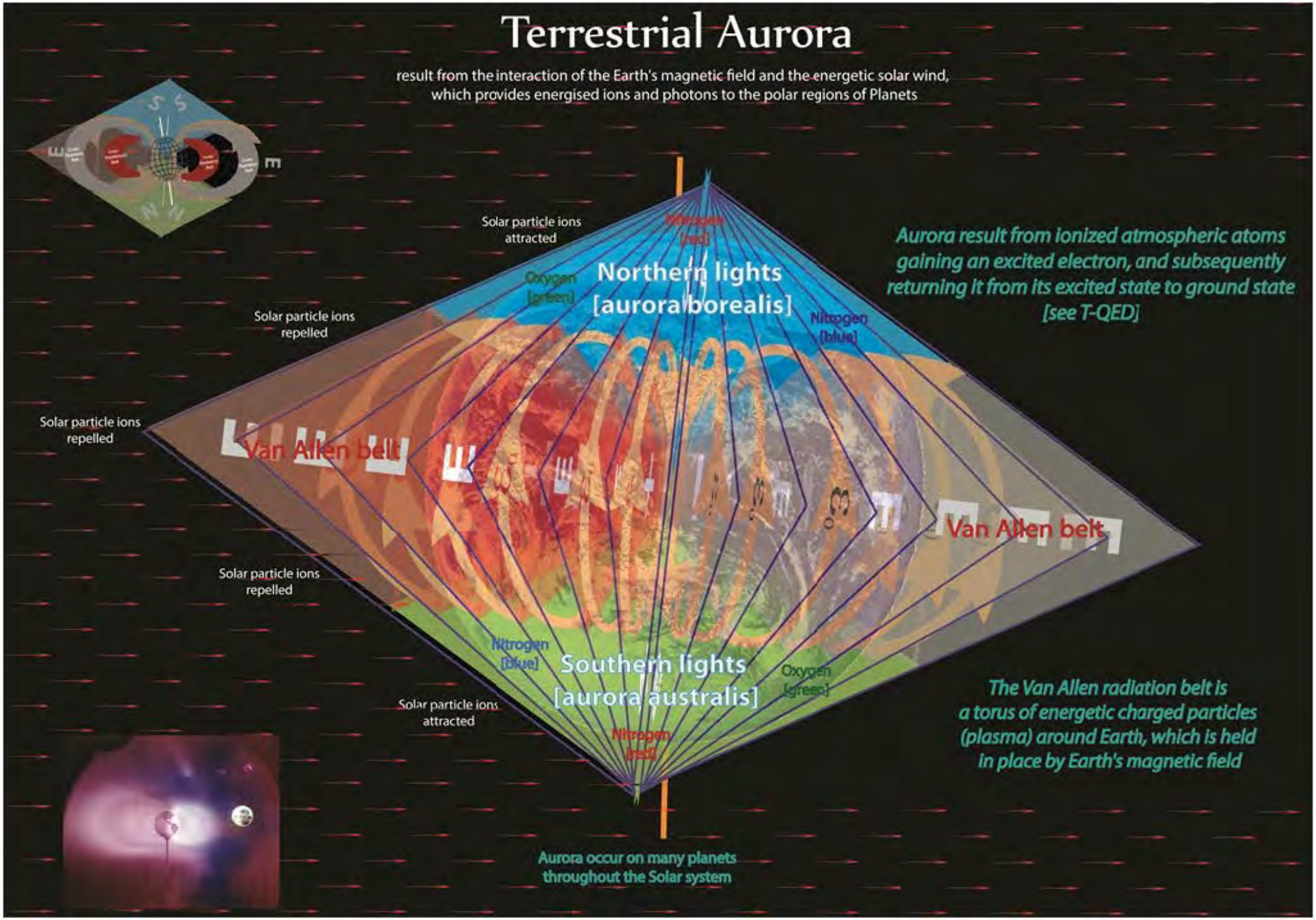
Terrestrial Aurora
result from the interaction of the Earth's magnetic field and the energetic solar wind, which provides energised ions and photons to the polar regions of Planets
Solar particle ions attracted
Nitrogen [red]
Oxygen [green]
Northern lights [aurora borealis]
Nitrogen [blue]
Solar particle ions repelled
Solar particle ions repelled
Van Allen belt
Van Allen belt
Solar particle ions repelled
Nitrogen [blue]
Southern lights [aurora australis]
Oxygen [green]
Solar particle ions attracted
Nitrogen [red]
Aurora result from ionized atmospheric atoms gaining an excited electron, and subsequently returning it from its excited state to ground state [see T-QED]
The Van Allen radiation belt is a torus of energetic charged particles (plasma) around Earth, which is held in place by Earth's magnetic field
Aurora occur on many planets throughout the Solar system

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Absolute Rest Frames

Absolute Rest is intrinsically linked to the concepts of absolute time and space originally introduced by Sir Isaac Newton in the Philosophiæ Naturalis Principia Mathematica, which provided a theoretical foundation that facilitated Newtonian mechanics.

According to Newton, absolute time and space respectively are independent aspects of objective reality.

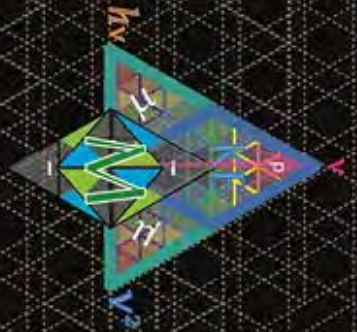
Rest in physics refers to an object being stationary relative to a particular frame of reference or another object

In Tetryonics an Inertial Rest frame can be determined by the absence of a Kinetic EM field & its Magnetic moment

The concepts of space and time were separate in physical theory prior to the advent of special relativity theory, which connected the two and showed both to be dependent upon the observer's inertial state of motion relative to other inertial frames.

In Einstein's theories, the ideas of absolute time and space were superseded by the notion of spacetime in special relativity, and by dynamically curved spacetime in general relativity.

$$p^2 = E = mv^2$$



$$\frac{P^2}{2} = KE = \frac{1}{2}Mv^2$$

In some of his later paper (especially in 1920 and 1924), Einstein gave a new definition of the aether by identifying it with "properties of space", and this aether can be called absolute, as long as its state cannot be influenced by Matter.

So he argued that Newton's absolute space can be considered as an "absolute aether". Also the four-dimensional spacetime of special relativity (which replaces the absolute space of Newton) would be some sort of "absolute aether", as its states cannot be influenced by Matter.

Tetryonics clearly establishes free space as a 3D volume filled with a interactive vacuum [aether] and EM energies against which any relative motion can be deduced by the presence (or absence) of divergent [K]EM fields produced as a direct result of Matter in motion additionally, 3D mass-Matter topologies displace the aether [vacuum energy field] producing convergent differential energy gradients [gravity fields]

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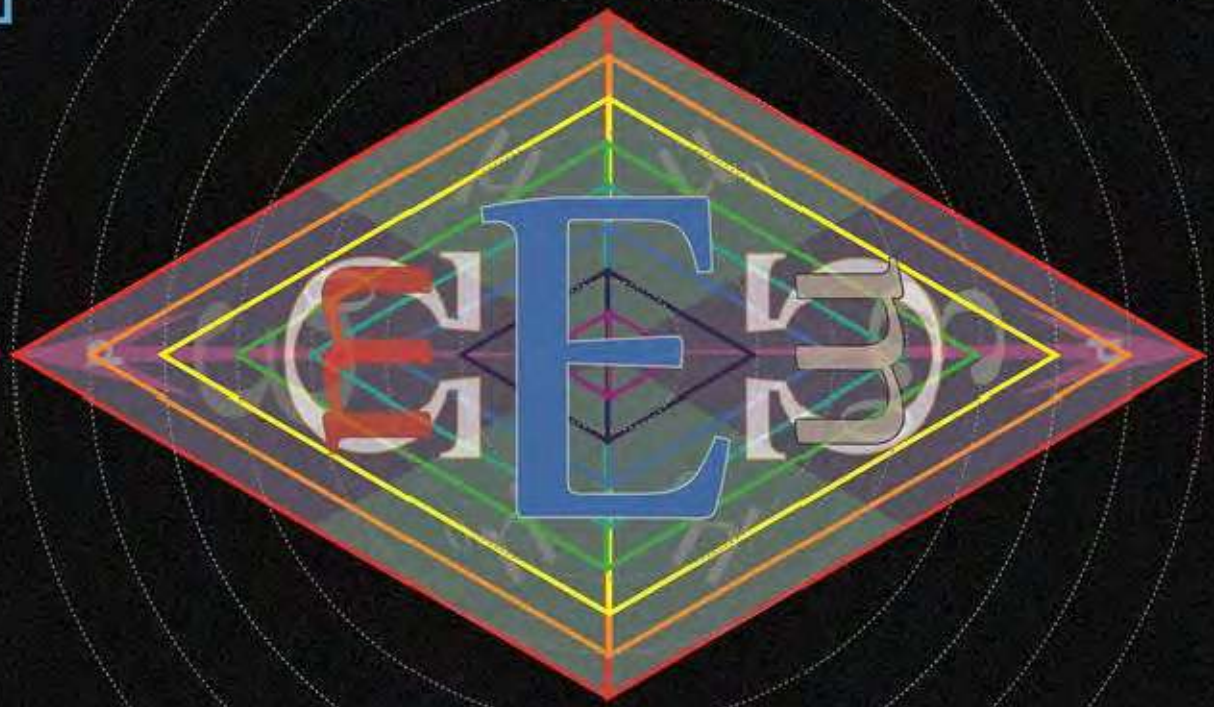
Red-shifted Photonic Energies

Energy is ALWAYS conserved... longer wavelength [red-shifted] photon energies are a reflection of the time specific measurement of photonic energies at a particular distance from the source of the light

Photons are neutral, coupled charge equilateral mass-energy momenta geometries that radiate bilaterally at the speed of light in a vacuum

Photons $\frac{2\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass; velocity)

EM waves EVEN $\frac{\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass; velocity)



As photons radiate from a point source at 'c'

their EM energies diminsh as per the inverse square law

producing the familiar red-shifting of spectral lines

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The red shift of Photons

$d\lambda$

According to special relativity, as something approaches the speed of light, the passage of time slows.
A twin moving at the speed of light would not age or change relative to the stationary twin.

General relativity additionally states that the cosmological red shift is the result of a photon traveling through an expanding space time field which causes the photon to loose energy and it's wavelength correspondingly increases.

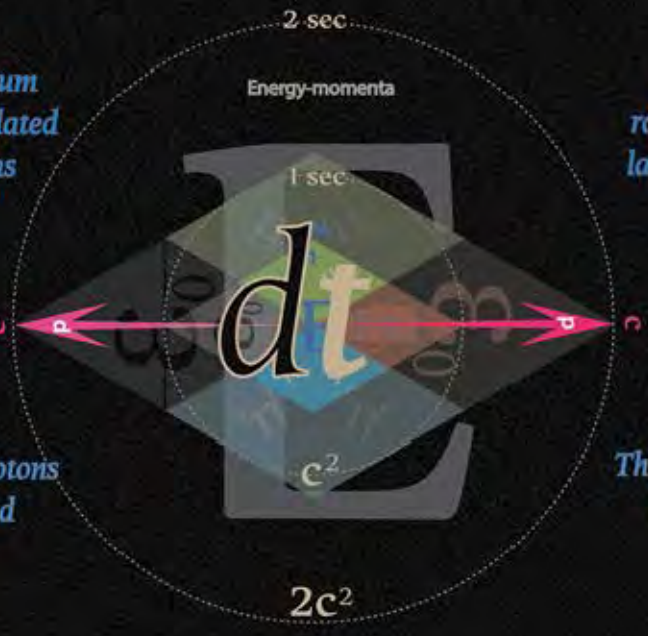
A photon travels at the speed of light; therefore it will not experience the passage of time, therefore it will not change; yet it does.

df

The divergent spreading of EM energy over time from a source creates the spacetime aether

The Quantised Angular Momentum and Energy content are directly related through the geometry of Photons

Blue-shifted photon travelling towards observer

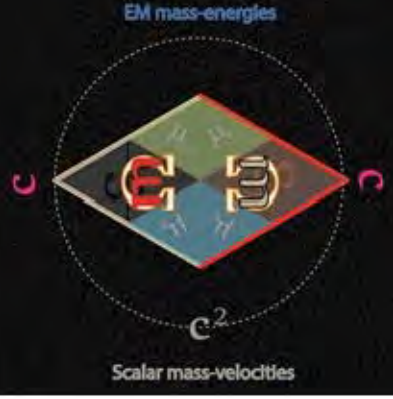


Red-shifted photon moving away from observer

All EM Energy waveforms (save Matter) radiate outward following the inverse square law & reducing their energy content over time

The EM mass-energy content of photons reveals photons to be a quantised electromotive field

The wavelength of a photon is related directly to its quantised mass-energy momenta geometry per unit of time



Tetryonic geometry relates photon mass-energy momenta to
the constant velocity of light in a vacuum and its intrinsic quantised angular momenta

$$\frac{mc^2}{c^2} = KE = \frac{h\nu^2}{c^2}$$

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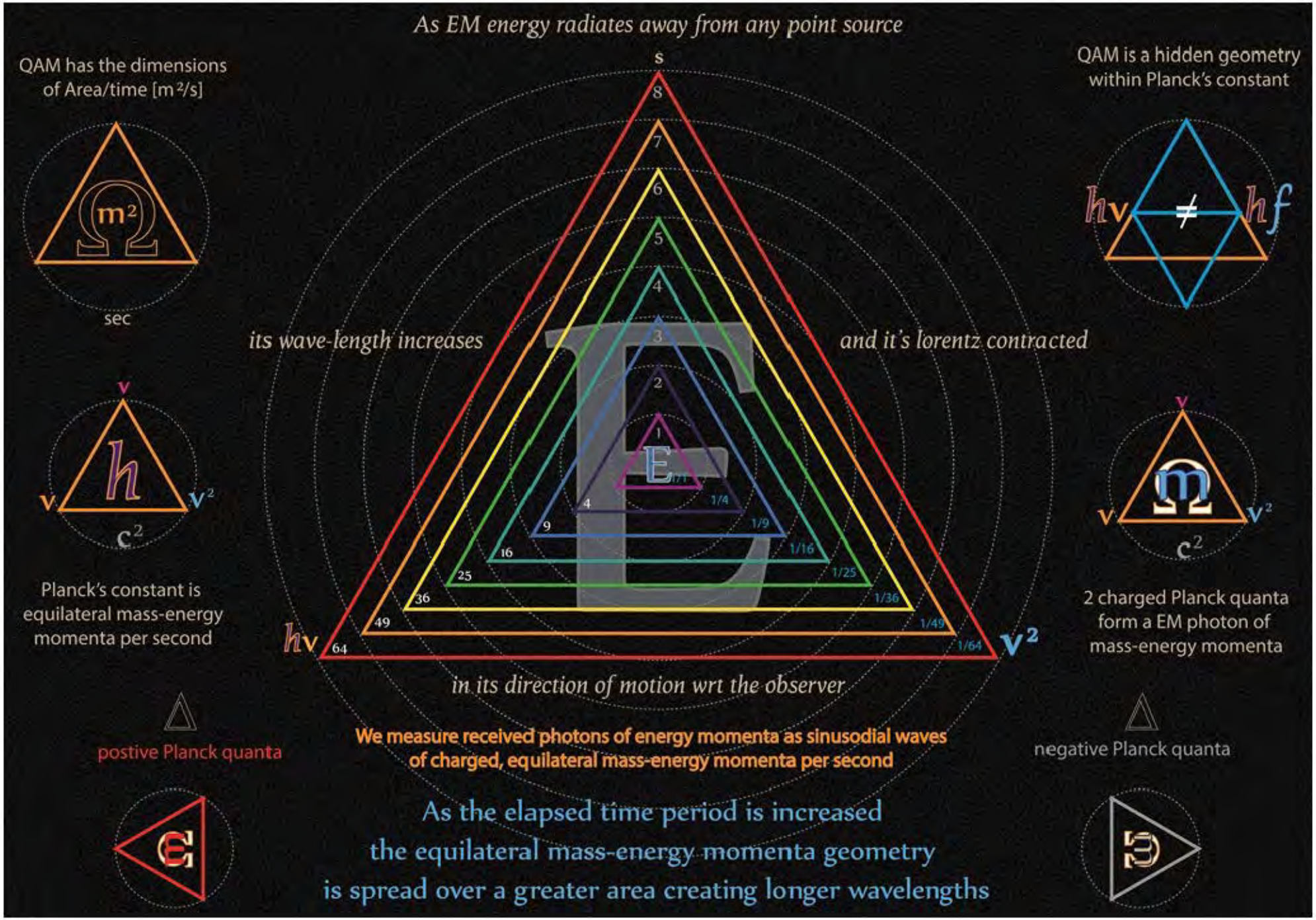

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The Doppler shifting of EM waves

Photons $\frac{2\pi}{c^2}[[m\Omega v^2]]$ (Planck quanta; mass, velocity)

EM waves $\frac{\text{EVEN}\,\pi}{c^2}[[m\Omega v^2]]$ (Planck quanta; mass, velocity)

General relativity incorrectly holds that the cosmological red shift is the result of a photon traveling through an expanding space time field which causes the photon to loose energy and it's wavelength correspondingly increases

Photonic energies form infitie energy loops [quantum transformers]

It is the Photon's intrinsic geometry that increases the further it travels from the source due to the inverse square law resulting in less energy (per unit of time) being recieved at increasing distances from the source as the Photon's specific QAM [m²/s] has increased over time

All EM waves are comprised of Photons of specific energies [Light is superpositioned EM waves]

All Photons are quantum harmonic oscillators and create sinusoidal EM waveforms are they radiate and are detected

2 sec

Photons are 2π divergent bi-directional mass-energy momenta geometries

Radiating geometric EM mass-energies from a source (over Distance-Time) creates the spatial vacuum aether

Blue-shifted

observer moves towards source *or* source moves towards observer

Any relative motion between the source & observer that reduces the distance between them produces a Blue-shift in the measured quanta-frequency/ energy of the EM wave

observer moves away from source *or* source moves away from observer

Red-shifted

Red-shifted

source moves away from observer *or* observer moves away from source

Any relative motion between the source and observer that increases the distance bewteen them produces a Red-shift in the measured quanta-frequency/ energy of the EM wave

source moves towards observer *or* observer moves towards source

Blue-shifted

Photonic mass-energies always propagate at c

2c²

Tetryonics clearly shows and relates Time to quantised angular momentum and Planck energy momenta to velocity

The energy of indiviudal photons is invariant until they interact with Matter and transfer their mass-energy momenta

motion toward the source increases the number of quanta per sec measured

[v+v]

Poor definintions of Energy per unit of Time along with the interchange of quanta and frequency have led to the mistaken concept of photons losing energy

$$mv^2 = E = hv^2$$

Photons DO NOT lose energy as they travel, the group energy [per unit of time] of the EM wave they form spreads out over time as a direct result of the inverse square law

motion away from the source decreases the number of quanta per sec measured

[v-v]

Cosmological doppler-shifting of Light is the direct result of the motion of Matter in the Universe

Gravitational Red-shifting is an EM effect not gravitational

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Relativistic Corrections

are applied to only [kinetic]EM mass-energy geometries

$$\frac{Mv^2}{c^2} = KEM = \frac{hv^2}{c^2}$$

$d\lambda$

dt

Wave-length contraction

linear
Lorentz corrections

$$\beta = \left[\frac{v}{c}\right]$$

SR - measuring rods in differing interial frames have different contracted lengths

GR - lengths measured in curved spacetime are different to straight lines in flat spacetime

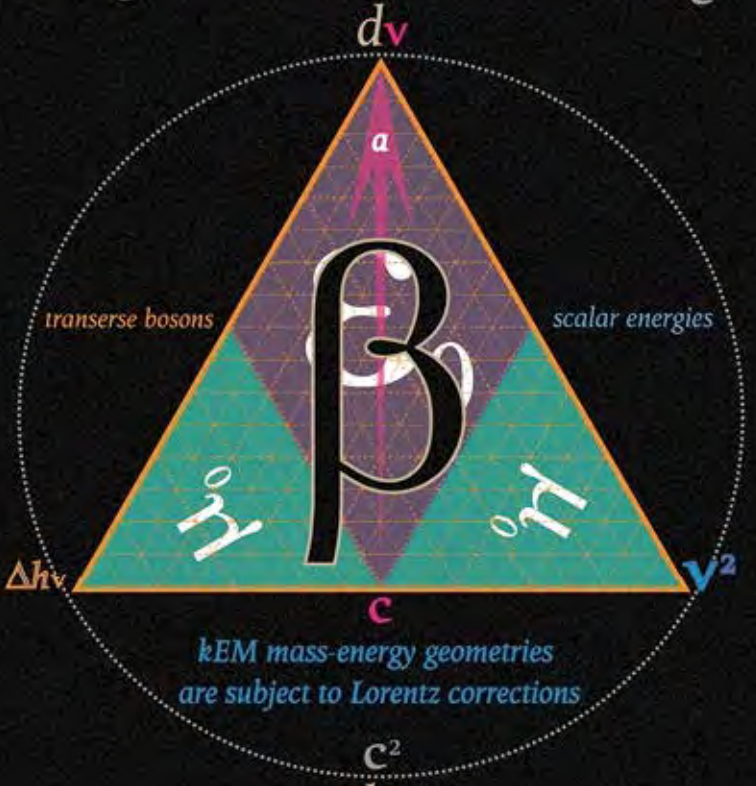
Time Dilation

scalar
Lorentz corrections

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

SR - clocks in differing inertial frames experience time dilation

GR - clocks in differing Gravitational fields experience time dilation



$$\frac{\Delta\Omega}{c}$$

$$\frac{T\pi}{c^4}\left[\left[m\Omega v\right]^2\right]$$

Matter — Planck quanta — mass — velocity

scalar energy momenta

linear momentum

$$\frac{\Delta\Omega}{c^2}$$

The mass-energies of standing-wave Matter topologies are Lorentz invariant

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GPS relativistic corrections

Claims that the Global Positioning System (GPS) provides a valid test of General relativity are erroneous
[GR provides Lorentzian [SR] correcttions under the guise of Gravitational effects]

Graviational Matter

M

All Matter topologies
produce
a Gravitational field

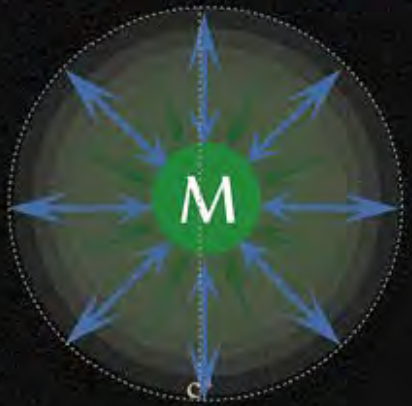
Photons are mass-energy momenta quanta
[they are Matter-less NOT mass-less]
and are subect to Lorentz Forces and corrections

Newton G + SR = GR *Einstein*
Lorentz

Interactive masses

m

All Matter in motion
produces
interactive mass-energies



Newtonian Gravity
is universal

The gravitational effects
caused by Matter can only
be accurately modelled [or
tested] through the exclusion
of all EM fields interactions

General Relativity
is limted to c

Any test of GR using Photons
as a testing mechanism
by definition is affected by
and subject to Special relativity
[ElectroMagnetic effects]

The 'gravitational' frequency shifting [Red-Blue shifting of EM waves] is in fact an electromagnetic effect

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The Bending of Light

Like the Perihelion of Mercury, the bending of Light due to Gravity as it passes near the limb of the Sun is a flawed test of GR that fails to distingush between Gravitational Matter and EM mass interactions due to GR's use of a Stress Energy Tensor that is reflective of all EM mass-ENERGY-Matter in the system being measured.

The 'Gravitational bending' of light as it passes close to Matter is a scientific misnomer

EM waves of light are refracted by the EM plasma enviroment of any star

According to General relativity, a light ray arriving from the left would be bent inwards such that its apparent direction of origin, when viewed from below would differ by an angle (a), whose size is inversely proportional to the distance (d) of the closest approach of the ray path to the center of mass.

All Light and EM waves are 2D ElectroMagnetic masses and are unaffected by gravity

Apparent position

Q

RE

All Light and EM waves are deflected and dispersed by ElectroMagnetic interactions

Newton $4\pi G + 4\pi SR = 8\pi GR$ Einstein

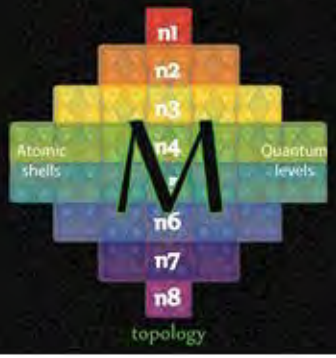
Lorentz correction

M

KE

3D standing-wave gravitational mass-Matter

2D radiant electromagnetic mass-energies



Light waves passing close to Massive objects experience a measureable DEFLECTION in their paths due to the ElectroMagnetic interaction of EM mass-energies

c^4

Gravitation is a result of convergent vacuum energy densities produced by toplogical EM mass-energies of Matter & their interactive mass-energy geometries

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The Perihelion of Mercury

is the result of EM interactions in addition to gravitational attraction

The perihelion of Mercury's orbit precesses at a measurable rate, but even after accounting for gravitational perturbations caused all other planets in the solar system, Newton's theory (assuming a precise inverse-square relationship for distance) predicts a rate of precession that differs from the measured rate by approximately 43 arcseconds per century.

Both Newton and Einstein saw Gravity as a singular force of attraction between objects and developed their math accordingly from the observed motions without any physical distinction between mass & Matter

$4\pi G$

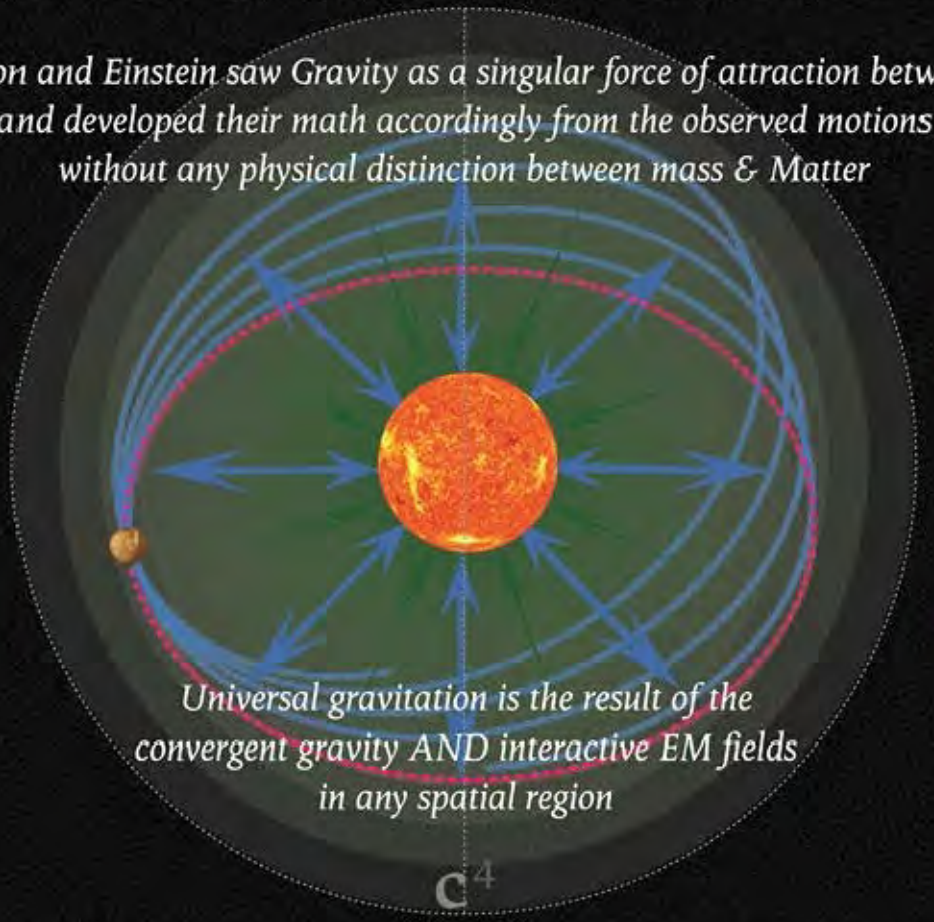
$8\pi G$

Newton modelled only the observed nett attractive force of Matter in the system

Einstein modelled the nett convergent force of all energies without differentiation

$$F = -G\frac{M_1 m_2}{r^2}$$

$$G_{ab} = \kappa T_{ab}$$



Universal gravitation is the result of the convergent gravity AND interactive EM fields in any spatial region

Newton

G

Einstein

$G+EM$

Newton Lorentz

c^4

General relativity was developed in part to provide an estimate for this rate of precession that better matches observations.

Newton's theory can also be 'incorrectly modified' to explain this perihelion by factoring in the gravitational pull due to other planets or making tiny adjustments to parameters in the gravitational equation to reflect the effect of ElectroMagnetic interactions between the Sun and Mercury.

By modelling the quantum interactions of ALL GEM mass-ENERGIES and their distinct geometries Tetryonic theory explains recently measured discrepancies in both Newtonian & GR formulations of Gravity

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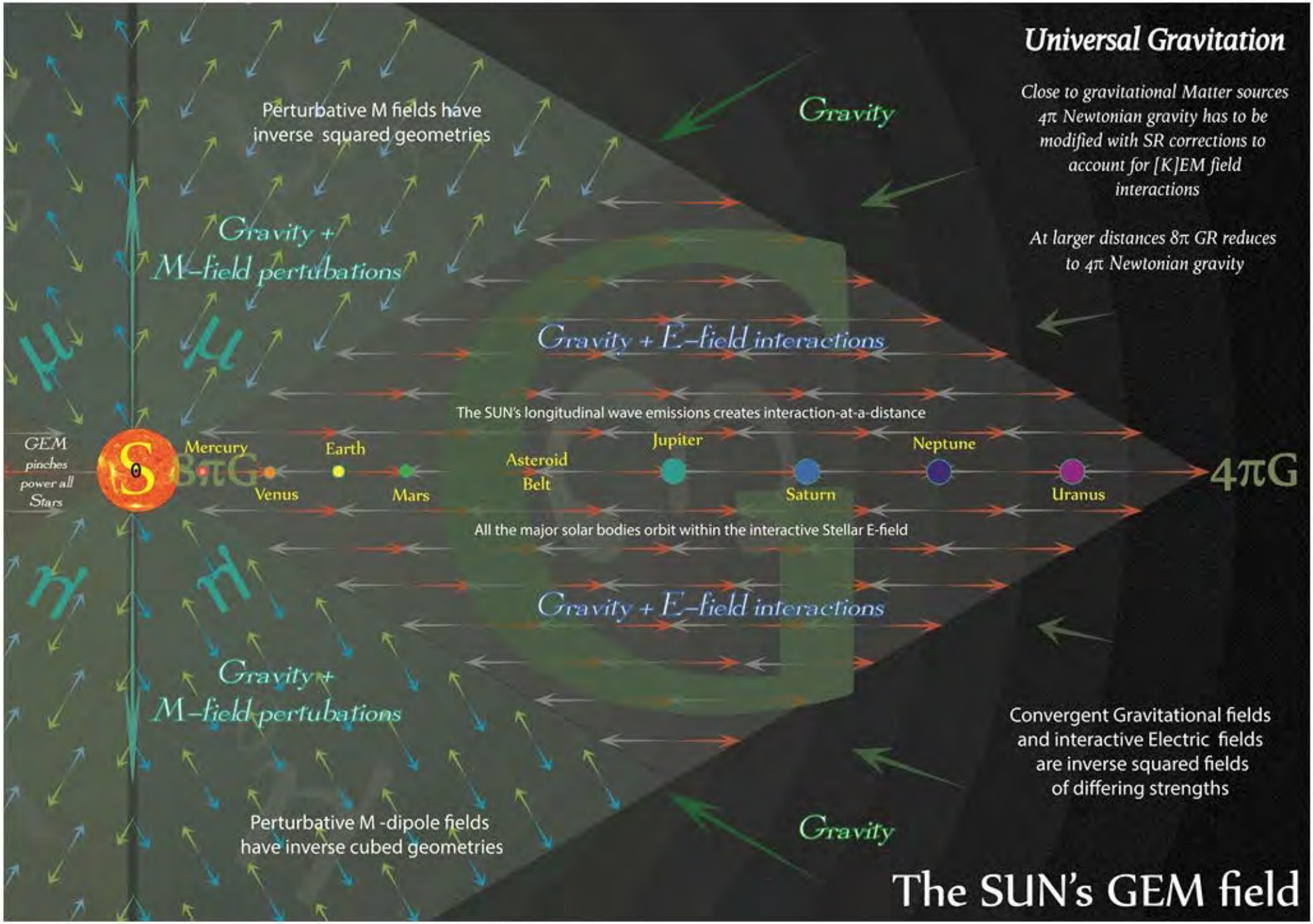
Universal Gravitation
Close to gravitational Matter sources 4π Newtonian gravity has to be modified with SR corrections to account for [K]EM field interactions
At larger distances 8π GR reduces to 4π Newtonian gravity
Perturbative M fields have inverse squared geometries
Gravity
Gravity + M–field pertubations
Gravity + E–field interactions
The SUN's longitudinal wave emissions creates interaction-at-a-distance
GEM pinches power all Stars
Mercury
Venus
Earth
Mars
Asteroid Belt
Jupiter
Saturn
Neptune
Uranus
8πG
4πG
All the major solar bodies orbit within the interactive Stellar E-field
Gravity + E–field interactions
Gravity + M–field pertubations
Convergent Gravitational fields and interactive Electric fields are inverse squared fields of differing strengths
Perturbative M -dipole fields have inverse cubed geometries
Gravity
The SUN's GEM field

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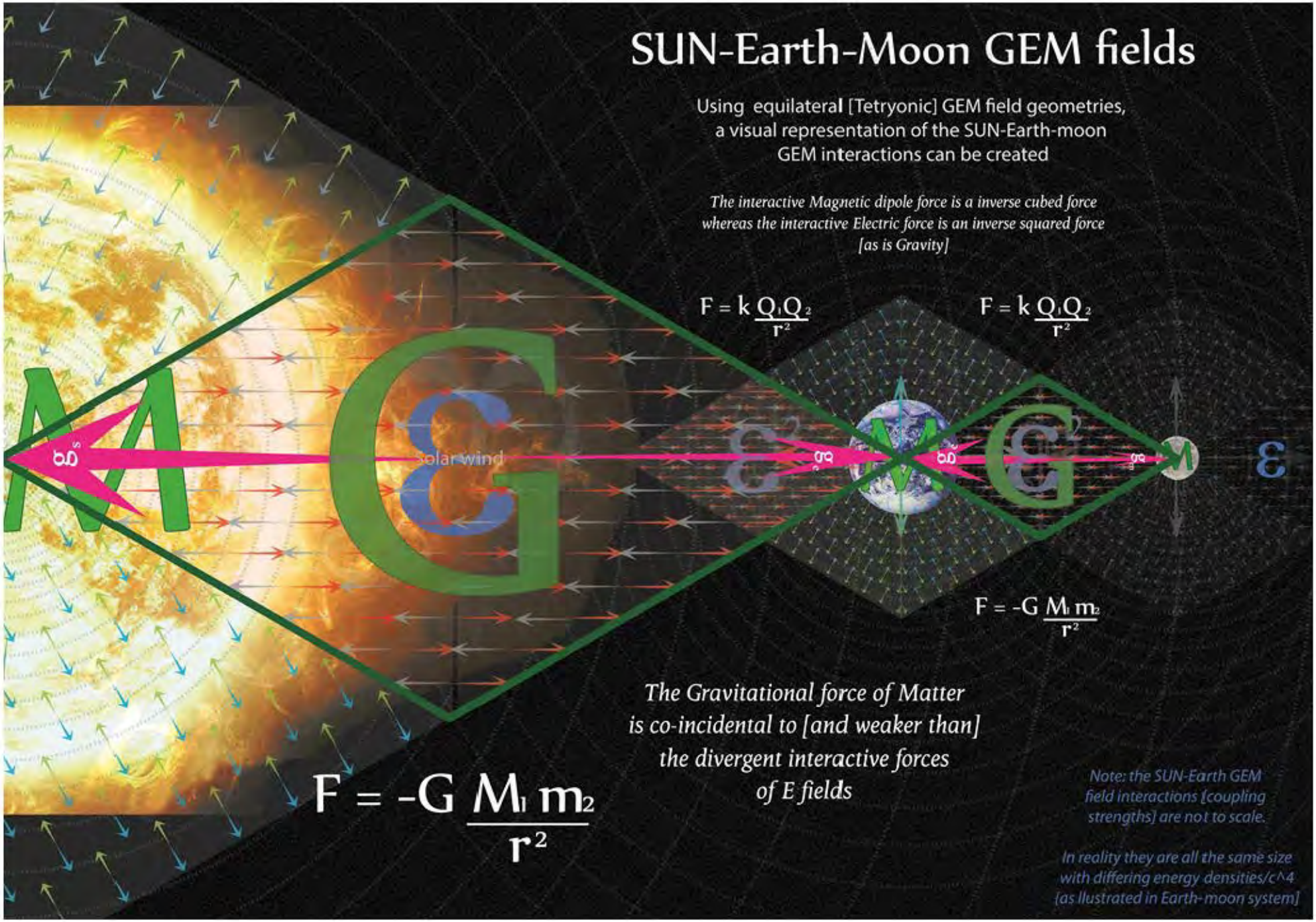
SUN-Earth-Moon GEM fields
Using equilateral [Tetryonic] GEM field geometries, a visual representation of the SUN-Earth-moon GEM interactions can be created
The interactive Magnetic dipole force is a inverse cubed force whereas the interactive Electric force is an inverse squared force [as is Gravity]
F = k Q1Q2 / r2
F = k Q1Q2 / r2
Solar wind
F = -G M1 m2 / r2
The Gravitational force of Matter is co-incidental to [and weaker than] the divergent interactive forces of E fields
F = -G M1 m2 / r2
Note: the SUN-Earth GEM field interactions [coupling strengths] are not to scale.
In reality they are all the same size with differing energy densities/c^4 [as illustrated in Earth-moon system]

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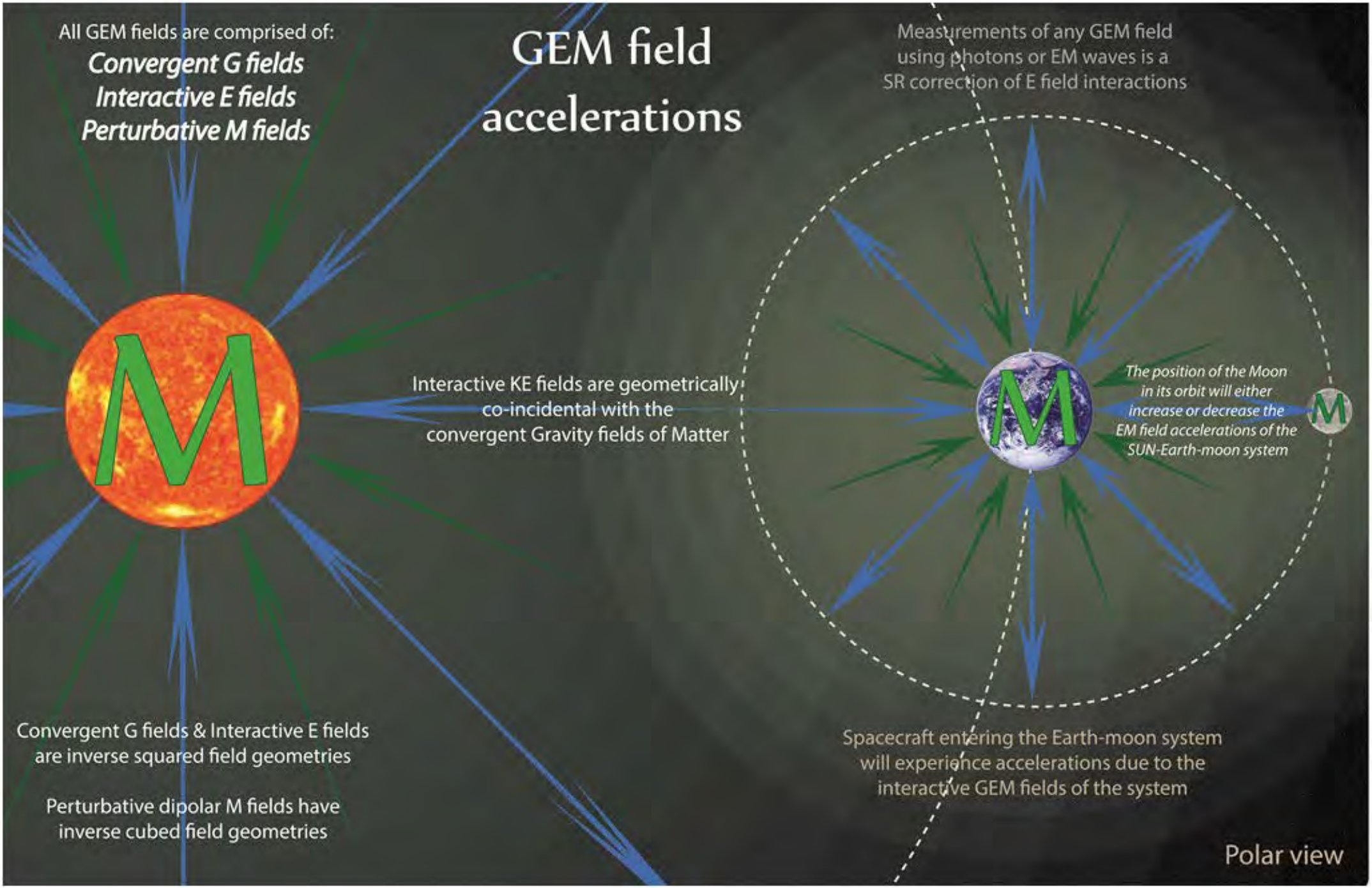
All GEM fields are comprised of:
Convergent G fields
Interactive E fields
Perturbative M fields
GEM field accelerations
Measurements of any GEM field using photons or EM waves is a SR correction of E field interactions
M
Interactive KE fields are geometrically co-incidental with the convergent Gravity fields of Matter
M
The position of the Moon in its orbit will either increase or decrease the EM field accelerations of the SUN-Earth-moon system
M
Convergent G fields & Interactive E fields are inverse squared field geometries
Perturbative dipolar M fields have inverse cubed field geometries
Spacecraft entering the Earth-moon system will experience accelerations due to the interactive GEM fields of the system
Polar view

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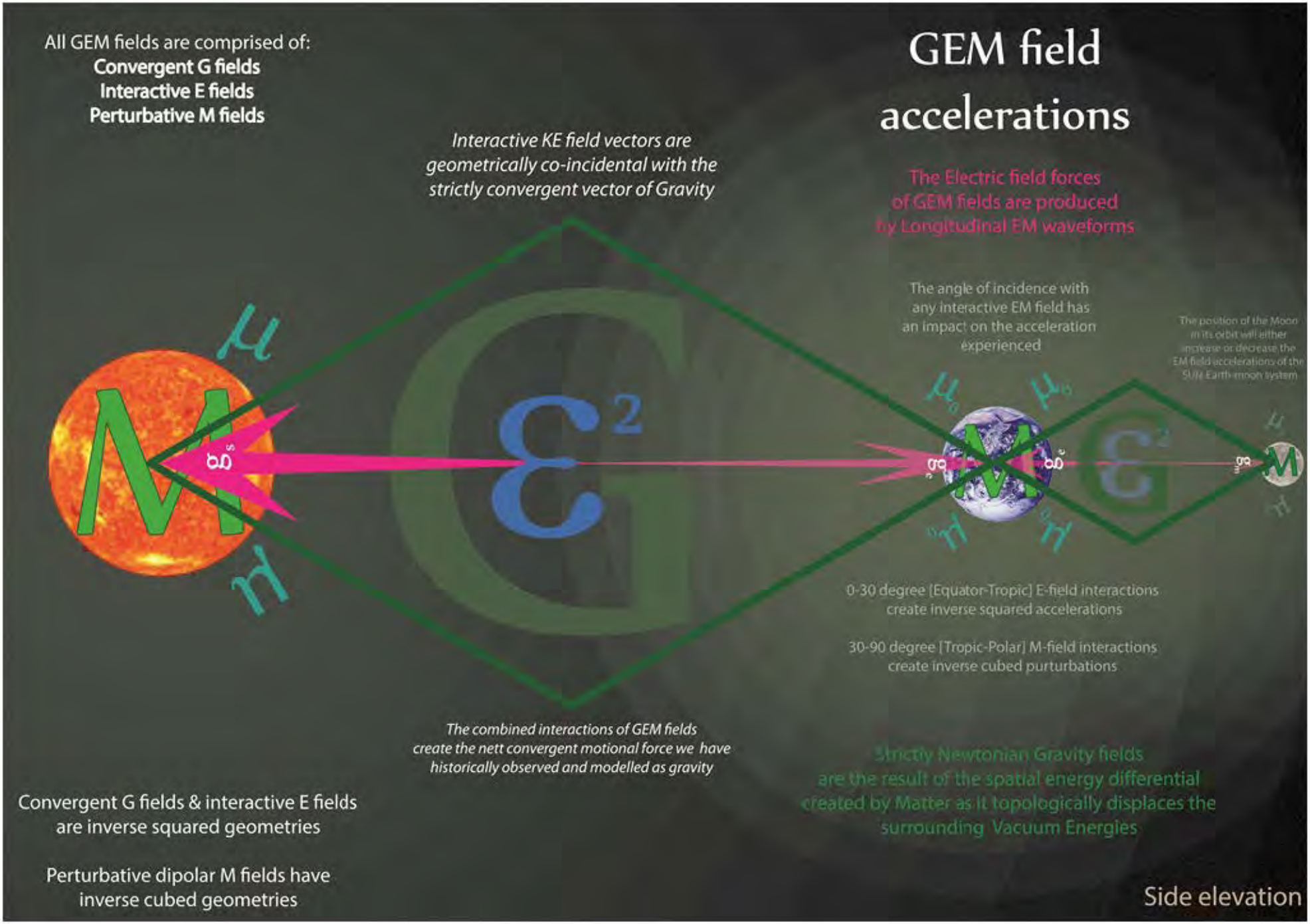
All GEM fields are comprised of:
Convergent G fields
Interactive E fields
Perturbative M fields
GEM field accelerations
Interactive KE field vectors are geometrically co-incidental with the strictly convergent vector of Gravity
The Electric field forces of GEM fields are produced by Longitudinal EM waveforms
The angle of incidence with any interactive EM field has an impact on the acceleration experienced
The position of the Moon in its orbit will either increase or decrease the EM field accelerations of the Sun/Earth-moon system
0-30 degree [Equator-Tropic] E-field interactions create inverse squared accelerations
30-90 degree [Tropic-Polar] M-field interactions create inverse cubed purturbations
The combined interactions of GEM fields create the nett convergent motional force we have historically observed and modelled as gravity
Strictly Newtonian Gravity fields are the result of the spatial energy differential created by Matter as it topologically displaces the surrounding Vacuum Energies
Convergent G fields & interactive E fields are inverse squared geometries
Perturbative dipolar M fields have inverse cubed geometries
Side elevation

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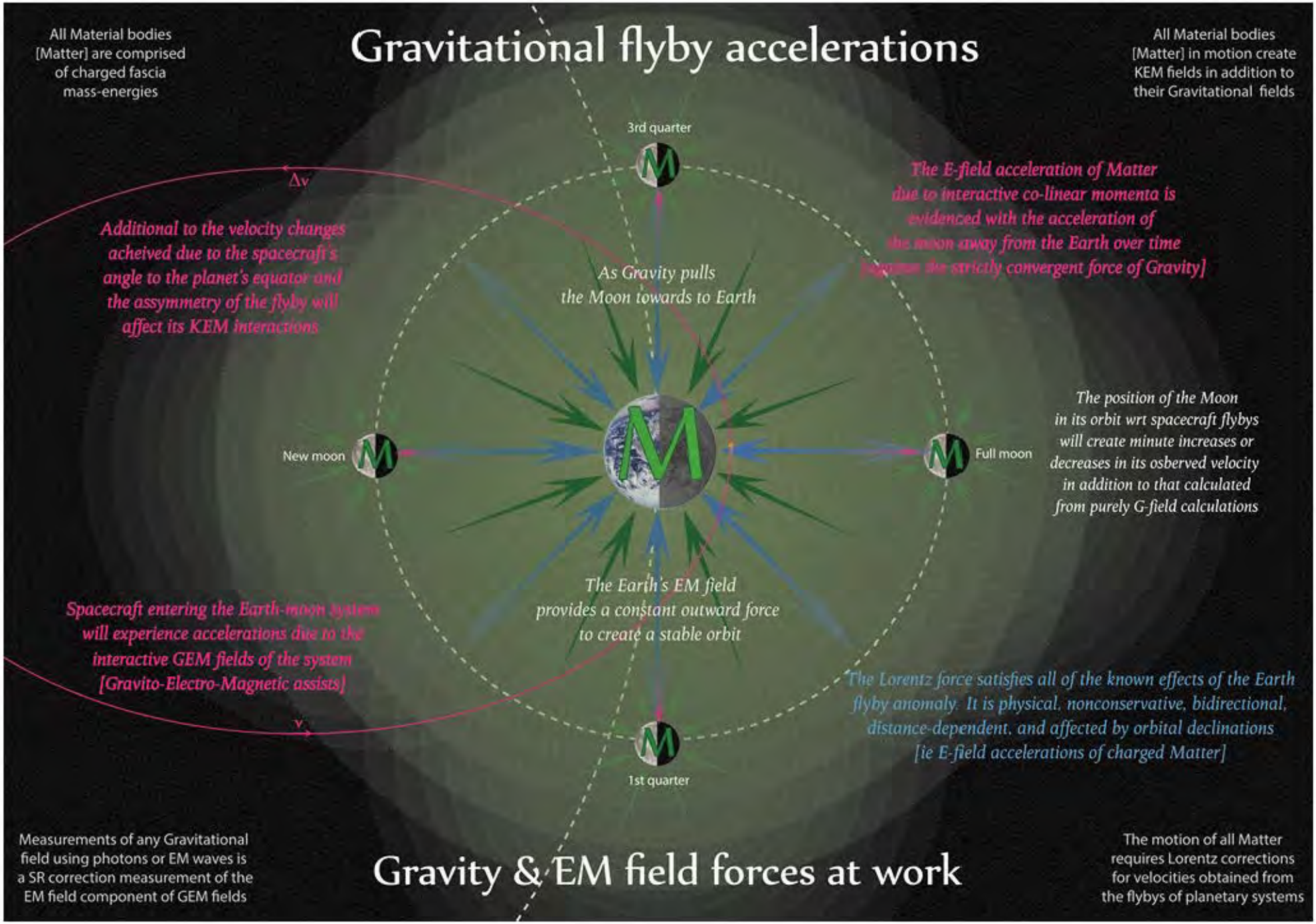
Gravitational flyby accelerations
All Material bodies [Matter] are comprised of charged fascia mass-energies
All Material bodies [Matter] in motion create KEM fields in addition to their Gravitational fields
3rd quarter
Δv
Additional to the velocity changes acheived due to the spacecraft's angle to the planet's equator and the assymmetry of the flyby will affect its KEM interactions
The E-field acceleration of Matter due to interactive co-linear momenta is evidenced with the acceleration of the moon away from the Earth over time [against the strictly convergent force of Gravity]
As Gravity pulls the Moon towards to Earth
New moon
Full moon
The position of the Moon in its orbit wrt spacecraft flybys will create minute increases or decreases in its osberved velocity in addition to that calculated from purely G-field calculations
The Earth's EM field provides a constant outward force to create a stable orbit
Spacecraft entering the Earth-moon system will experience accelerations due to the interactive GEM fields of the system [Gravito-Electro-Magnetic assists]
v
The Lorentz force satisfies all of the known effects of the Earth flyby anomaly. It is physical, nonconservative, bidirectional, distance-dependent, and affected by orbital declinations [ie E-field accelerations of charged Matter]
1st quarter
Measurements of any Gravitational field using photons or EM waves is a SR correction measurement of the EM field component of GEM fields
Gravity & EM field forces at work
The motion of all Matter requires Lorentz corrections for velocities obtained from the flybys of planetary systems

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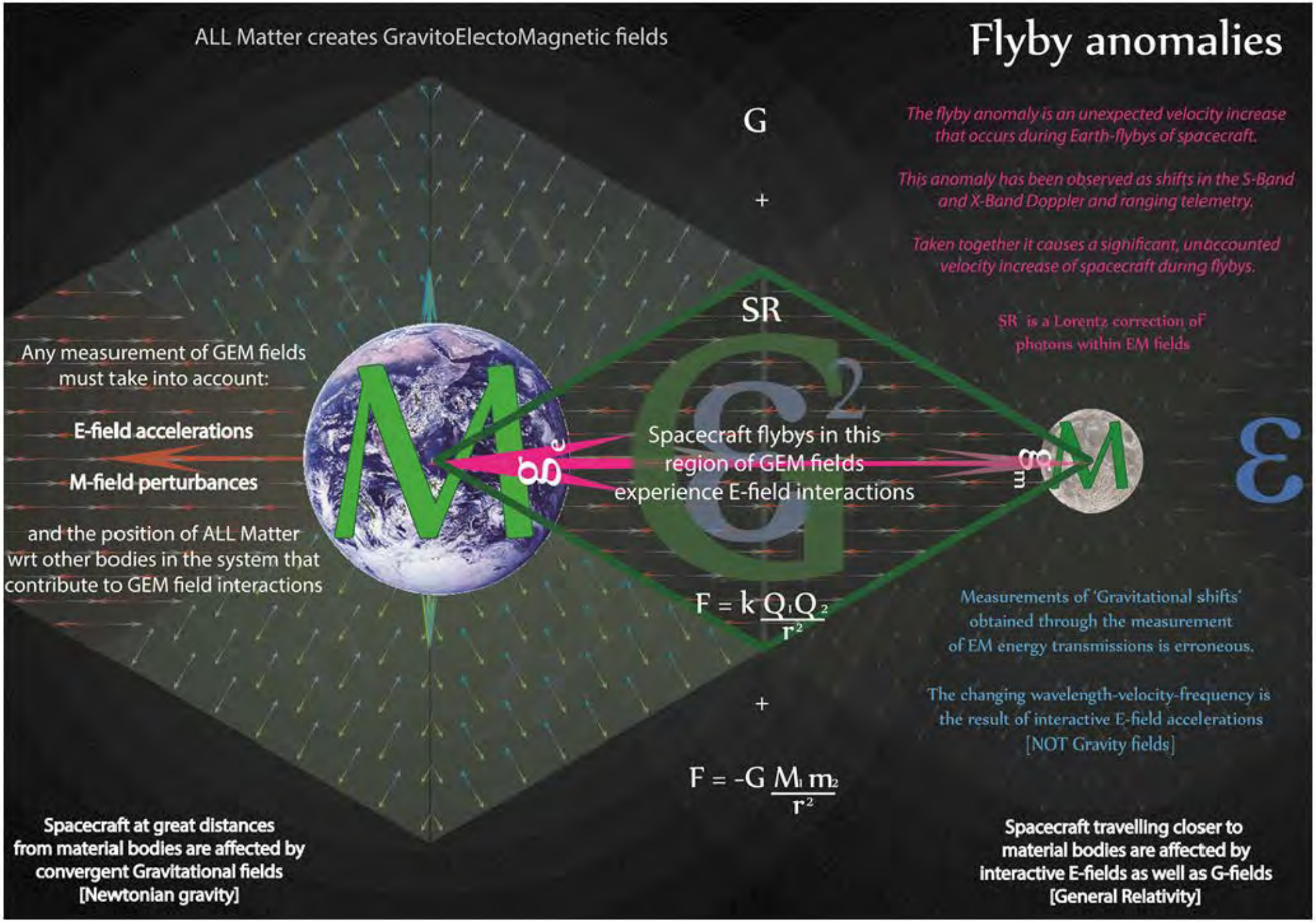
ALL Matter creates GravitoElectoMagnetic fields
Flyby anomalies
The flyby anomaly is an unexpected velocity increase that occurs during Earth-flybys of spacecraft.
This anomaly has been observed as shifts in the S-Band and X-Band Doppler and ranging telemetry.
Taken together it causes a significant, unaccounted velocity increase of spacecraft durng flybys.
SR is a Lorentz correction of photons within EM fields
G
+
SR
Any measurement of GEM fields must take into account:
E-field accelerations
M-field perturbances
and the position of ALL Matter wrt other bodies in the system that contribute to GEM field interactions
Spacecraft flybys in this region of GEM fields experience E-field interactions
F = k Q1Q2 / r2
+
F = -G M1 m2 / r2
Measurements of 'Gravitational shifts' obtained through the measurement of EM energy transmissions is erroneous.
The changing wavelength-velocity-frequency is the result of interactive E-field accelerations [NOT Gravity fields]
Spacecraft at great distances from material bodies are affected by convergent Gravitational fields [Newtonian gravity]
Spacecraft travelling closer to material bodies are affected by interactive E-fields as well as G-fields [General Relativity]

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Pioneer anomaly

Despite many proposed solutions,
there is not yet an accepted explanation
for the cause of the Pioneer velocity anomaly

Newtonian Gravitation

$$F = -G \frac{M_1 m_2}{r^2}$$

measures the nett gravitational attraction
of Matter towards other Matter
[using weak [K]EM fields]

Viewed down from
north ecliptic pole

Many proposals
have been put forward to
explain this unexpected
acceleration towards the Sun

Pioneer 10

Voyager 2

Pioneer 11

Voyager 1

Jupiter

Mars

Saturn

Uranus

Neptune

Pluto

Earth

Sun

The modelling of solar Spacecraft motions using either Newtonian Gravitation or Einstein's General relativity is problematic as neither model accurately reflects the true, dynamic GravitoElectroMagnetic interacitons of our Solar system and its environment

Tetryonic GEM interactions shows
that the measured acceleration is
the result of a weakening, inverse
squared stellar EM interaction
throughout the Solar heliopause

This would result in
a decrease in divergent
acceleration away from the Sun
which has been mis-interpretted as
an acceleration toward the Sun

General Relativity

$$G_{ab} = \kappa T_{ab}$$

calculates for the total Gravitational and
EM interactions for energy in all its forms
[using Energy pressure gradients]

"Both Pioneer spacecraft are escaping the Solar System, and are slowing under the influence of the Sun's nett gravitational [GEM] field.

Upon very close examination of navigational data, the spacecraft were found to be slowing slightly more than expected.
The effect is an extremely small but unexplained acceleration towards the Sun, of 8.74±1.33×10−10 m/s2"

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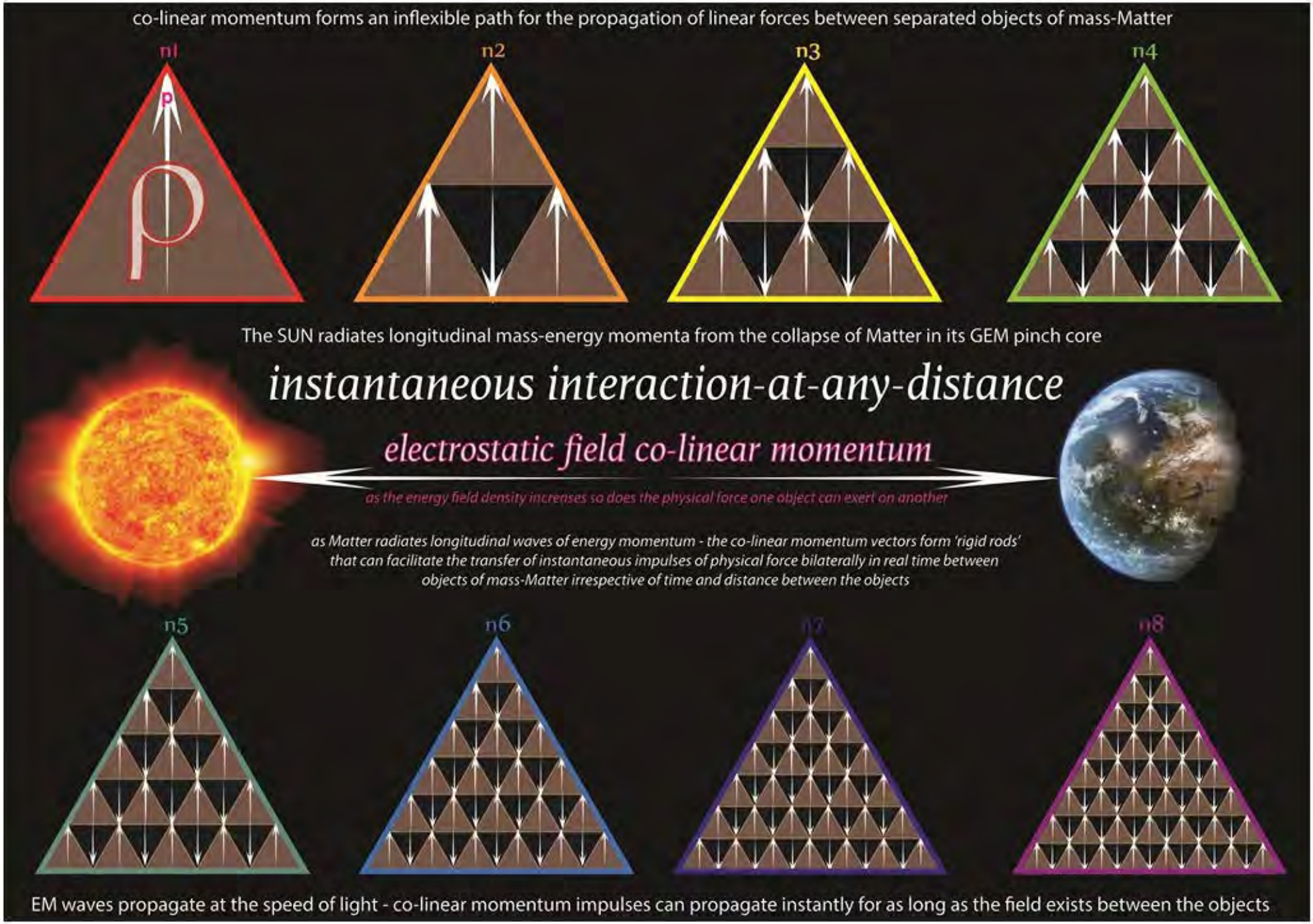
co-linear momentum forms an inflexible path for the propagation of linear forces between separated objects of mass-Matter
n1
n2
n3
n4
p
ρ
The SUN radiates longitudinal mass-energy momenta from the collapse of Matter in its GEM pinch core
instantaneous interaction-at-any-distance
electrostatic field co-linear momentum
as the energy field density increases so does the physical force one object can exert on another
as Matter radiates longitudinal waves of energy momentum - the co-linear momentum vectors form 'rigid rods' that can facilitate the transfer of instantaneous impulses of physical force bilaterally in real time between objects of mass-Matter irrespective of time and distance between the objects
n5
n6
n7
n8
EM waves propagate at the speed of light - co-linear momentum impulses can propagate instantly for as long as the field exists between the objects

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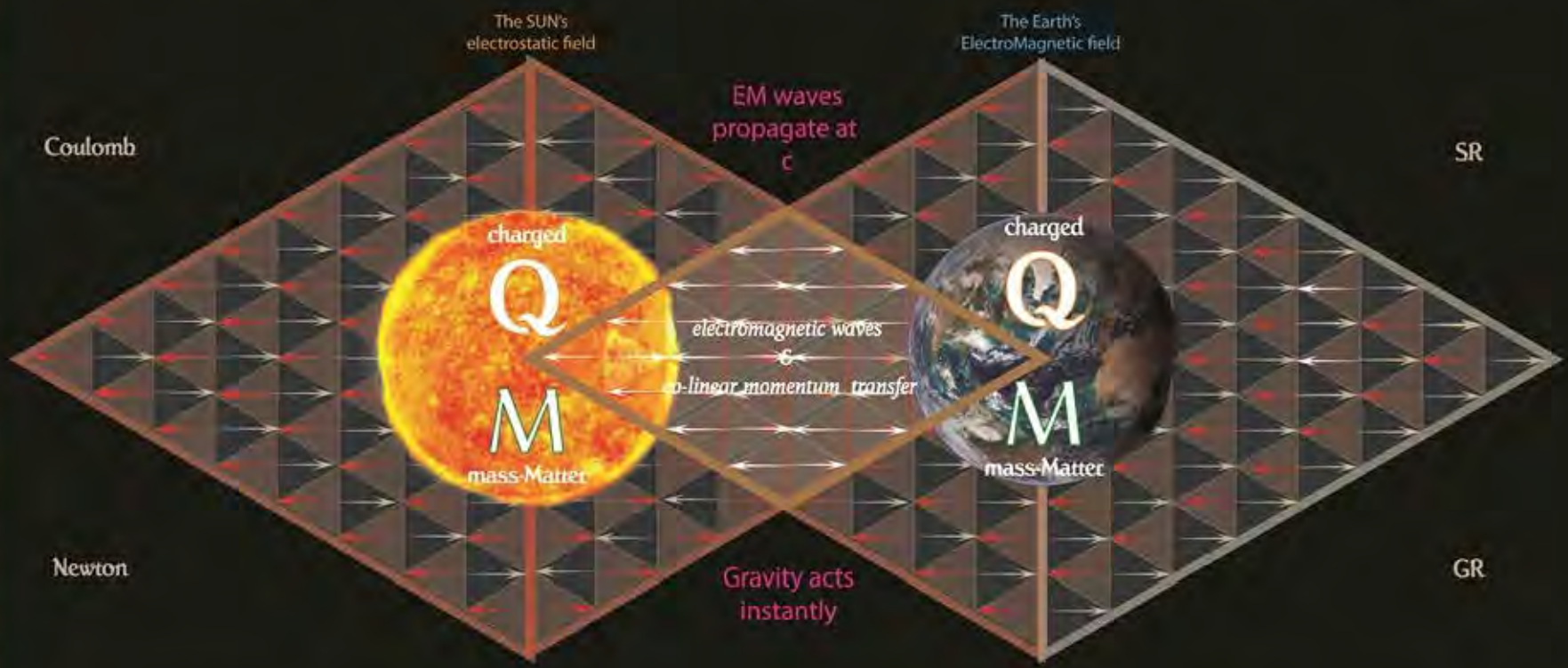
Instantaneous interaction-at-a-distance

One of the major points of disagreement between Newtonian Graviation and General Relativity concerns Einstein's limiting of information and energy momenta propagation to the speed of light whereas the Newtonian physics for Gravitation acts instantly between Matter irrespective of distance and time



particles interact with others in real time irrespective of distance

the flow of energy and information is limited to the speed of light

Where electrostatic and/or electromagnetic fields overlap they form fields of interaction between bodies of Matter

the 'quantum rods' of co-linear momentum in their EM fields facilitate 'FTL spooky interaction-at-a-distance' facilitating near instantaneous [real time] impulses of linear momentum to convey physical forces over vast distances without loss for as long as the fields exist between the objects

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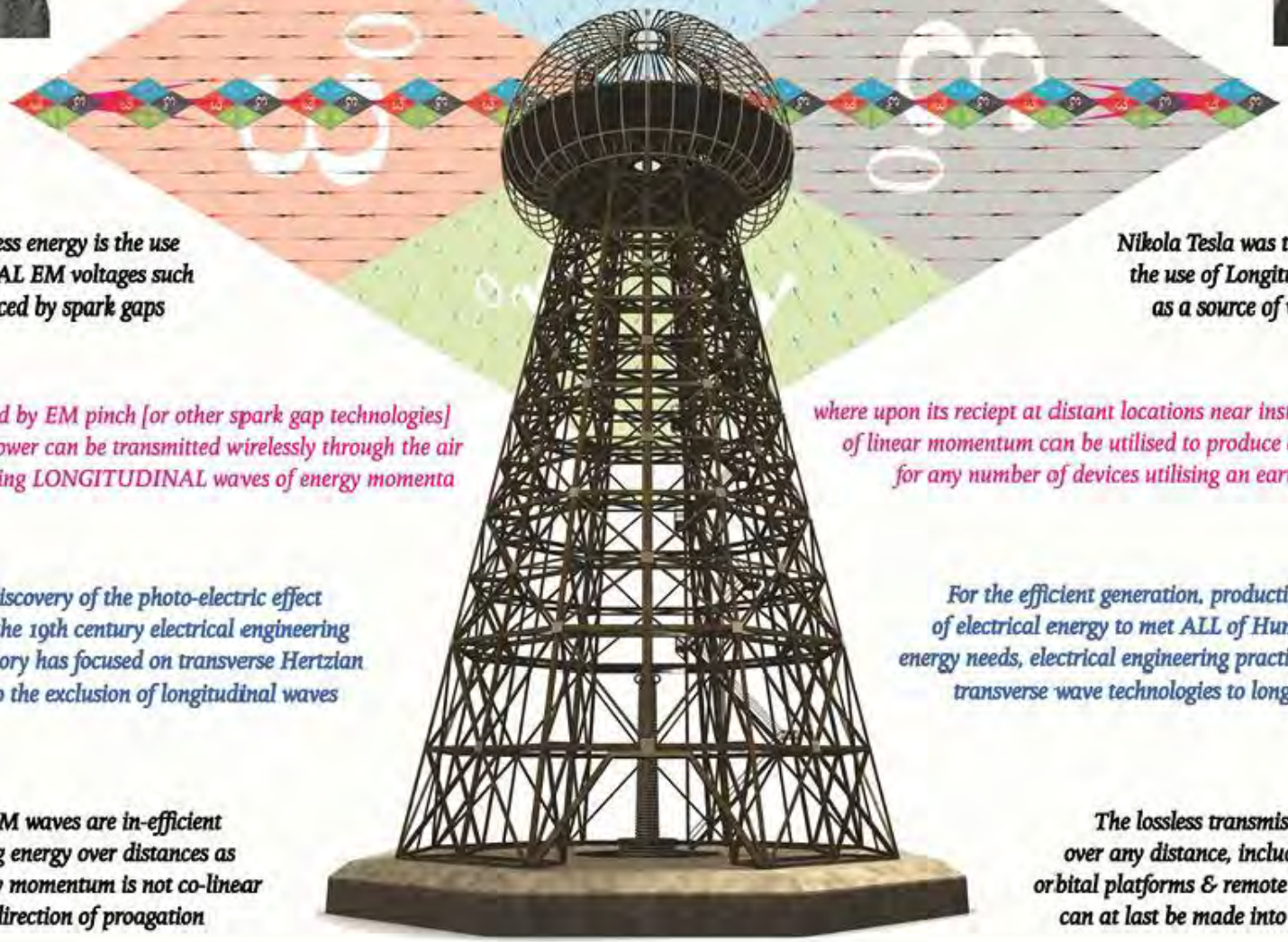
The efficient wireless transmission of electrical energy requires the creation of a large electrostatic field of longitudinal energy momenta



The key to wireless energy is the use of LONGITUDINAL EM voltages such as those produced by spark gaps

Nikola Tesla was the first to promote the use of Longitudinal EM waves as a source of wireless energy

Once generated by EM pinch [or other spark gap technologies] real electrical power can be transmitted wirelessly through the air without loss using LONGITUDINAL waves of energy momenta

where upon its reciept at distant locations near instanteous impulses of linear momentum can be utilised to produce electrical work for any number of devices utilising an earth return

Since the discovery of the photo-electric effect at the turn of the 19th century electrical engineering and physics theory has focused on transverse Hertzian waveforms to the exclusion of longitudinal waves

For the efficient generation, production and storage of electrical energy to met ALL of Humanities growing energy needs, electrical engineering practices must move from transverse wave technologies to longitudinal waves

Transverse EM waves are in-efficient for transmitting energy over distances as their linear energy momentum is not co-linear with their direction of proagation

The lossless transmission of power over any distance, including to and from orbital platforms & remote locations on Earth, can at last be made into a physical reality

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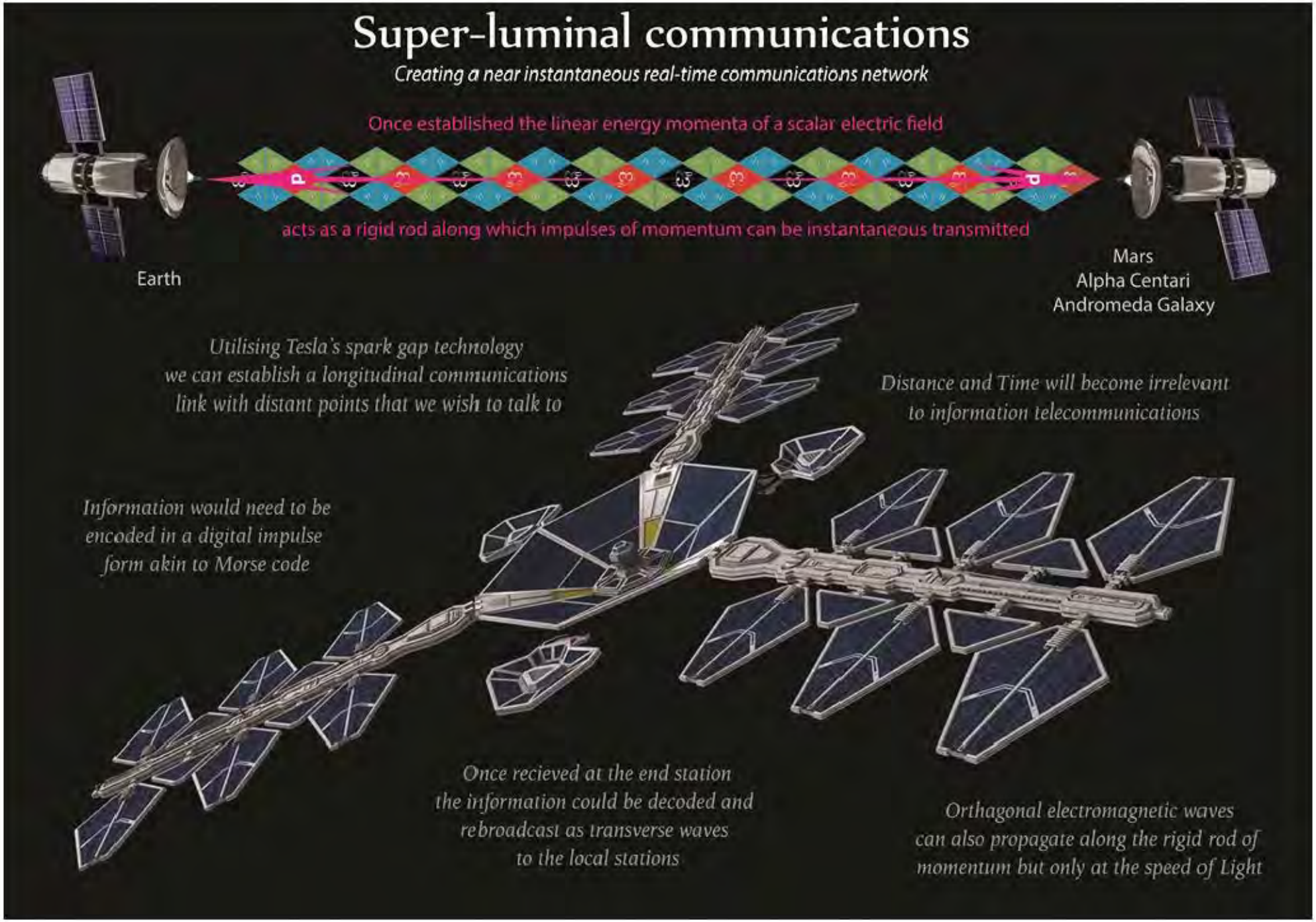
Super-luminal communications
Creating a near instantaneous real-time communications network
Once established the linear energy momenta of a scalar electric field
acts as a rigid rod along which impulses of momentum can be instantaneous transmitted
Earth
Mars
Alpha Centari
Andromeda Galaxy
Utilising Tesla's spark gap technology
we can establish a longitudinal communications
link with distant points that we wish to talk to
Distance and Time will become irrelevant
to information telecommunications
Information would need to be
encoded in a digital impulse
form akin to Morse code
Once recieved at the end station
the information could be decoded and
rebroadcast as transverse waves
to the local stations
Orthagonal electromagnetic waves
can also propagate along the rigid rod of
momentum but only at the speed of Light

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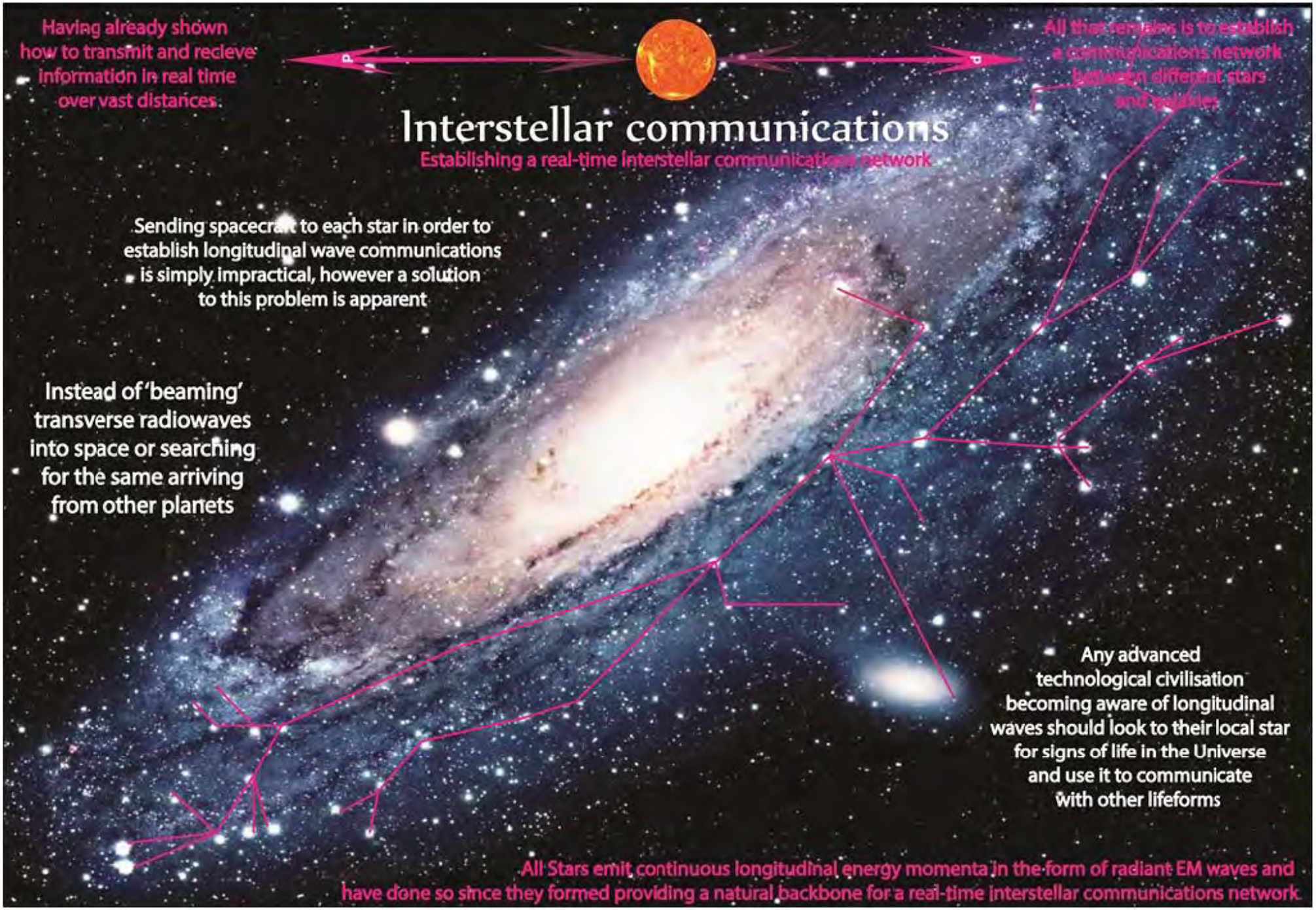
Having already shown how to transmit and recieve information in real time over vast distances
All that remains is to establish a communications network between different stars and galaxies
Interstellar communications
Establishing a real-time interstellar communications network
Sending spacecraft to each star in order to establish longitudinal wave communications is simply impractical, however a solution to this problem is apparent
Instead of 'beaming' transverse radiowaves into space or searching for the same arriving from other planets
Any advanced technological civilisation becoming aware of longitudinal waves should look to their local star for signs of life in the Universe and use it to communicate with other lifeforms
All Stars emit continuous longitudinal energy momenta in the form of radiant EM waves and have done so since they formed providing a natural backbone for a real-time interstellar communications network

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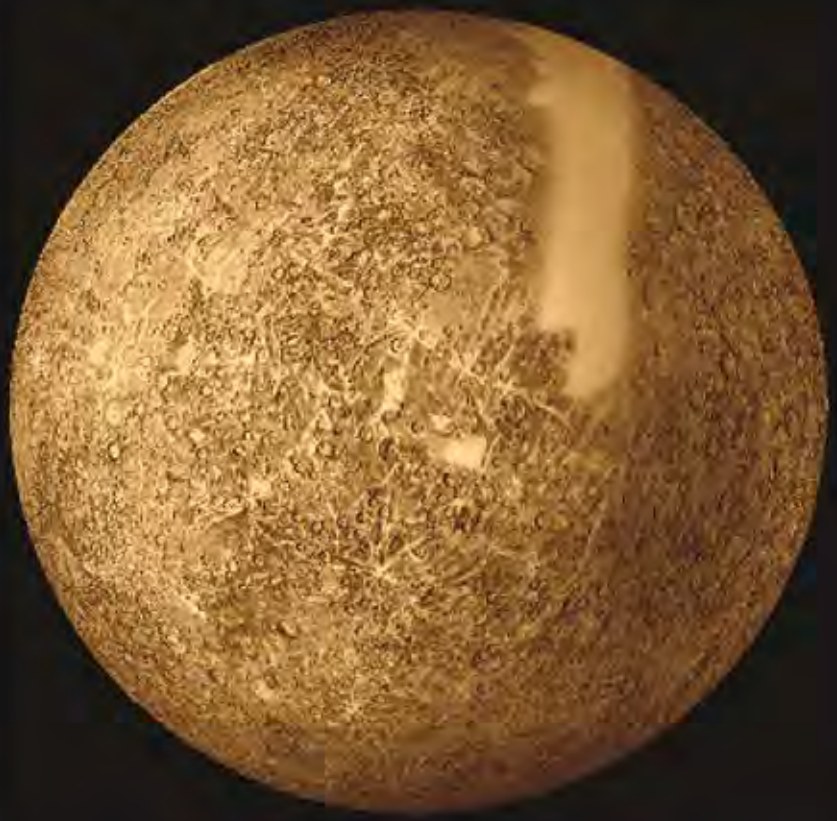
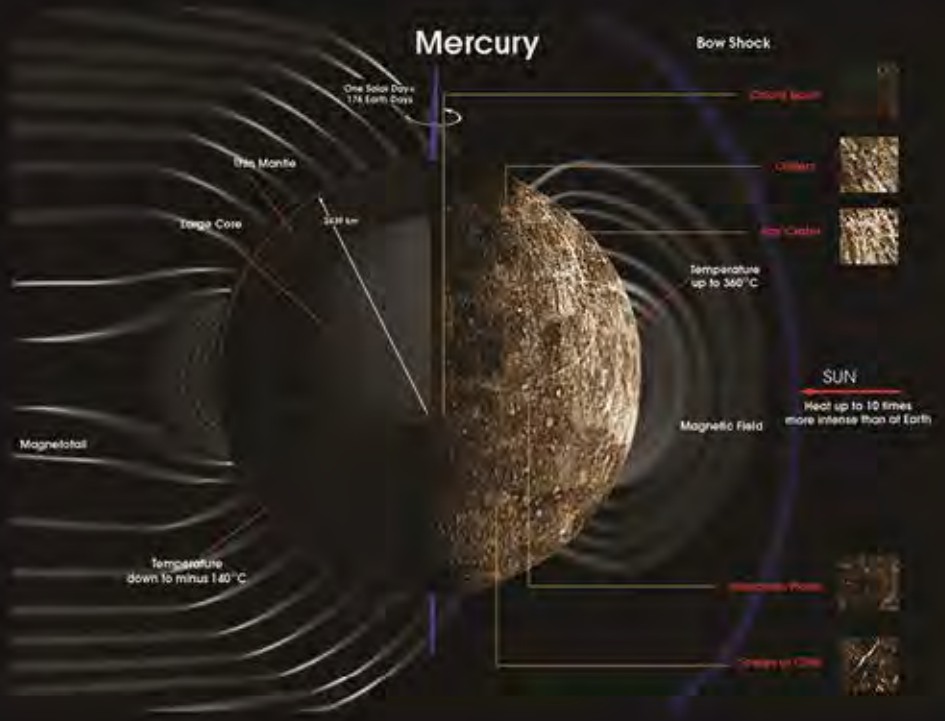
Mercurial anomalies



Mercury has a weak magnetic field



Mercury has heat of its own, not just reflected heat of the Sun;

Mercury has still an atmosphere of Hydrogen, possibly the last vestiges of a more extensive halo and trail (caduceus)

Mercury rotates because it is in its present orbit it is strongly affected by the EM field of the SUN,

Because the ElectroMagnetic forces near the Sun need to be accounted for in the motion of any satellite about a more massive body [ie Satellite-Planet or Planet- Sun], the stronger E & perturbative M forces are responsible for the observed precession of the perihelion of Mercury, and Leverrier's discovery of this precession can be modelled with Einsteins' General relativity through Tetryonic geometries

Laplace showed that should a celestial body attracted by its primary as Inverse square of distance be subject to another attraction that changes as the Inverse cube of distance, a precession by that body would result.

Einstein corrected Newton's gravitational results by calculating for ALL the energies in a system but failed to realise that his 'graviational correction' was in fact a Lorentz correction for EM interactions

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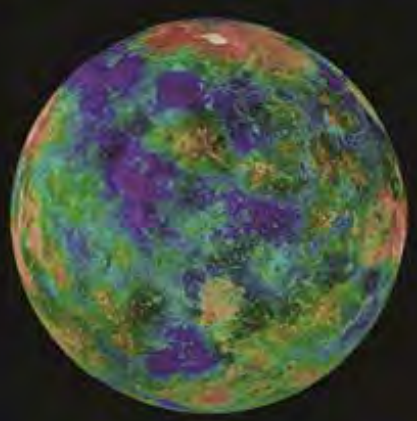
Venusian anomalies

is sometimes referrd to as Earth's "twin" owing to their similar size, gravity, and bulk composition.



Venus has the densest atmosphere of all the terrestrial planets in the Solar System, consisting of mostly carbon dioxide. The atmospheric pressure at the planet's surface is 92 times that of the Earth.

Venus is the hottest world in the solar system. Although Venus is not the planet closest to the sun, its dense atmosphere traps heat in a runaway version of the greenhouse effect that warms up the Earth.

As a result, temperatures on Venus reach 465 degrees C

The lack of an intrinsic magnetic field at Venus was surprising given it is similar to Earth in size, and was expected also to contain a dynamo at its core

Venus has no moons or rings

Galileo's discovery that Venus showed phases (while being never very far from the Sun in our sky) proved that it orbits the Sun and not the Earth

The Venusian year is about 225 Earth days long.

Venus takes 243 Earth days to rotate on its axis, which means that days on Venus would be longer than years. However, because of Venus' curious retrograde rotation, the time from one sunrise to the next is only about 117 Earth days

The very top layer of Venus' clouds zip around the planet every four Earth days, propelled by hurricane-force winds traveling roughly 224 miles (360 kilometers) per hour.

This super-rotation of the planet's atmosphere, some 60 times faster than Venus itself rotates, may be one of Venus' biggest mysteries.

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Earth-Moon anomalies

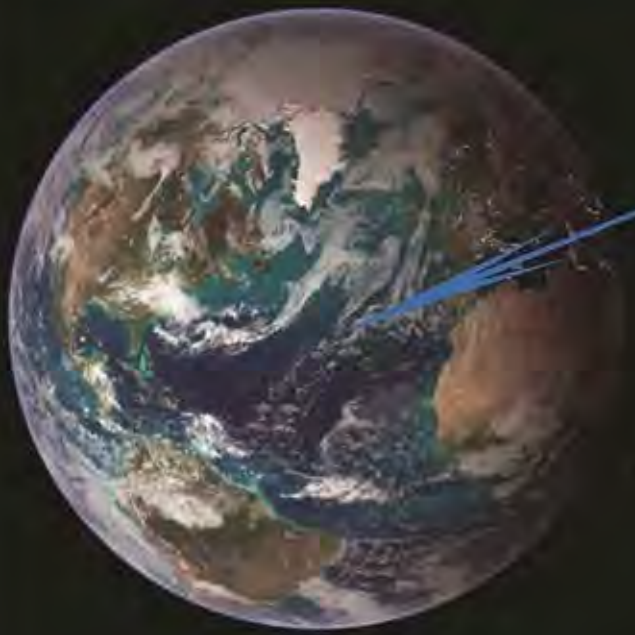
The Moon's Origin

Most scientists think the moon was born from a gargantuan collision, when a young, 30-million-year-old Earth was sideswiped by an embryonic planet the size of Mars some 4.5 billion years ago, with debris from our planet and this impactor eventually coalescing from the ejecta to form our Moon.

The Moon is slowly accelerating away from the Earth

Athough it is attracted gravitationally to the Earth the Moon is moving away from the Earth at about 4cm per year as a result of the Earth's EM field interactions with Matter in its vicinity.

The Lunar a lunar day is a month long, the same as the Moon's orbital period



The Earth's EM field accelerates the moon against the pull of gravity stabilising its orbit. its current field strength forces the moon to slowly accelerate away from the Earth over time

The Moon only shows one face to the Earth

it is gravitational locked in its orbit with one side always facing the Earth when viewed from the Earthat night. There is no such thing as the "dark side of the moon". The sun shines on all sides

The Moon is 400 times smaller than the SUN
The SUN is 400 times more distant

The Moon looks exactly the same size as the Sun

"There is no astronomical reason why the moon and the sun should fit so well. It is the sheerest of coincidences, and only the Earth among all the planets is blessed in this fashion." .....Isaac Asimov

A striking coincidence that has had astronomers thinking since ancient times is why the Sun and the Moon appear to be the same size during an eclipse. It's known that the Sun's diameter is 400 times that of the Moon, but, then again, the Moon is 400 times further away from the Sun.

This creates the optical illusion that the two are actually the same size, allowing us to observe the Solar corona and its EM field lines

Our moon is the only moon in the solar system that has a stationary, near-perfect circular orbit. Stranger still, the moon's center of mass is about 6000 feet closer to the Earth than its geometric center (which should cause wobbling), but the moon's bulge is on the far side of the moon, away from the Earth. "Something" had to put the moon in orbit with its precise altitude, course, and speed.

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Martian anomalies

Phobos

There is no completely satisfactory theory as to how Deimos and Phobos came to be in orbit around Mars

With a dametre of 6 km Deimos is one of the smallest known moons in the solar system

Deimos

Although Mars is much smaller than Earth, [approx 1/4 the size] its surface area is about the same as the land surface area of Earth

Deimos and Phobos are probably asteroids perturbed by Jupiter into orbits that allowed them to be captured by Mars

The southern hemisphere of Mars is predominantly ancient cratered highlands somewhat similar to the Moon.

In contrast, the northern hemisphere consists of plains which are much younger, lower in elevation and have a much more complex history.

Mars orbits about 1.5au from the SUN

An abrupt elevation change of several kilometers seems to occur at the boundary

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Jupiters' anomalies

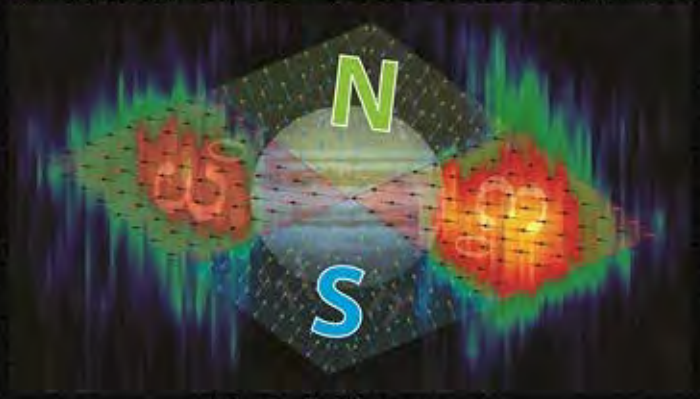
Jupiter has an intense and far-reaching magnetic field.
Exactly what drives the magnetic powerhouse and
how deep inside the planet it originates, however, is unknown

Jupiter's diameter is approx
1/10 that of the SUN and
10 times the size of Earth

Jupiter has twelve satellites.

The five inner moons revolve around their planet in orbits only slightly inclined to the planet's equator at distances from about 110,000 miles for the innermost to about 640,000 miles for the outermost.

Jupiter's mass is 2.5 times that of all the other planets in our Solar System combined



Tetryonic EM geometry
offers answers to many of the dynamic
mysteries of Jupiter and its moons

Then there is a group of three moons whose orbits are inclined to the planet's equator by almost 30° at distances of about 7 million miles from Jupiter.

These three moons also revolve around the planet in the predicted direction.

The four outer moons, however, move around the planet in retrograde motion, or opposite to that of the other eight satellites, at distances from about 12 to 13 million miles from the planet

Its Great Red Spot
has a circumference
about the same as the Earth

Jupiter also has the most energetic auroras in the solar system at both of its poles

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Saturnian anomalies

In addition to the planet's giant rings, Saturn has nine major moons and more than 60 known satellites.

The motion of the outermost, Phoebe, is retrograde, moving in a direction opposite to the other eight moons and opposite to that predicted from an evolutionary origin.

Tetryonic theory suggests that this retrograde motion is the result of it being a gravitationally captured body whose motion over time will be slowed, eventually forcing it into the same motion as the others

TITAN
is the only moon that possesses a thick atmosphere, and it's the only place beyond Earth to have stable bodies of liquid Methane on its surface

The rings of Saturn occasionally exhibit ghostly radial spokes that seemingly defy the laws of gravity

The Saturnian rings, like many others, are formed by the electric field of the planet and subject to seasonal fluctuations of the SUN's heliospheric E-field

Tetryonic GEM interactions shows that these features are the result of electric forces additional to gravity

Strange features abound within the rings of Saturn. These include hundreds of "record grooves" or narrow fluctuations in the B ring, the most massive ring.

These also include "plateaus" in the C ring, the innermost main ring—broad, dark, sharp-edged features thicker than elsewhere in the ring.

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Neptunes' anomalies

Neptune was the first planet found by mathematical prediction rather than by empirical observation

Neptune has two satellites.

Nereid, a small moon, moves around Neptune in the predicted direction, but Triton, one of the larger satellites in the solar system with a mass almost twice that of the earth's moon.

Of Neptune's 13 moons, Triton is by far the biggest and the only one massive enough to be spheroidal.

Weirdly, Triton has a "retrograde" orbit, revolving in the opposite direction of the planet and other moons.

Plus, the orbit is at an angle rather than in the plane around the equator like typical satellites

The magnetic field of Neptune, like that of Uranus, is highly tilted at 47 degrees from the rotation axis and offset at least 0.55 radii (about 13,500 kilometers or 8,500 miles) from the physical center

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Uranus' anomalies

Uranus is remarkable, even though it rotates around the sun in the same direction as the other planets in an orbit inclined less than a degree (46') from the ecliptic (the plane of the earth's orbit around the sun), the axis of rotation of Uranus is nearly in the plane of its orbit.

Accordingly, the inclination of the equator of Uranus to the plane of its orbit is 98°, and its axial rotation is retrograde.

The five moons or satellites of Uranus move exactly in the equatorial plane of the planet and they revolve in the same direction as the planet rotates.

Their motion, with respect to the remainder of the solar system, is, therefore, also retrograde.

The direction of the axial rotation of Uranus and the motion of its satellites is opposite to that predicted on the basis of an evolutionary origin.

Tetryonic theory dictates that Uranus' peculiar planetary mechanics may be the result of the EM interactions of Uranus itself with its satellites rather than the current evolutionary explanation

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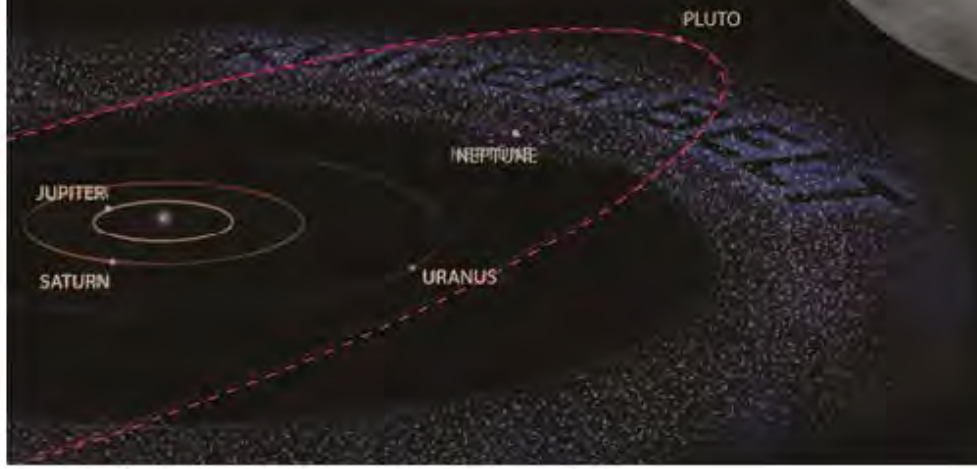
Pluto's anomalies

Pluto is much smaller than any of the official planets
and due to its size and orbital inclination
is now classified as a "dwarf planet"

Pluto rotates in the opposite direction
to that of most of the other planets

Pluto is locked in a 3:2 resonance with Neptune;
i.e. Pluto's orbital period is exactly 1.5 times longer than Neptune's.
Its orbital inclination is also much higher than the other planets

Pluto's orbit is highly eccentric.
At times it is closer to the Sun than Neptune



Charon is unusual in that it is
the largest moon with respect to its
primary planet in the Solar System
(a distinction once held by Earth's moon)

The Pluto–Charon system is noteworthy
for being one of the Solar System's
few binary system

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Cometary anomalies

Comets provide some of the clearest evidence of Electromagnetic interactions between the SUN and other planetary bodies

While the solid nucleus of comets is generally less than 50 km across, the coma may be larger than the Sun, and ion tails have been observed to extend 3-4 astronomical units (5-600 million km)

Cometary discharging may also occur due to any disturbances of its electrical plasma sheath as it passes through regions of varying electric potential.

This seems to have occurred in the recent "totally surprising" outburst of Comet Holmes 17P as it moved away from the Sun's domain.

In 2000 the explosive break up of Comet Linear provoked great amazement as the event occurred well over a hundred million kilometers from the Sun

Other anomalies that can be explained by a CHARGED model of cometary nuclei are:
Unexpectedly high temperatures and X-ray emissions from cometary comas

The sharply carved relief of comets
[the exact opposite of what is expected under the "dirty snowball" model]

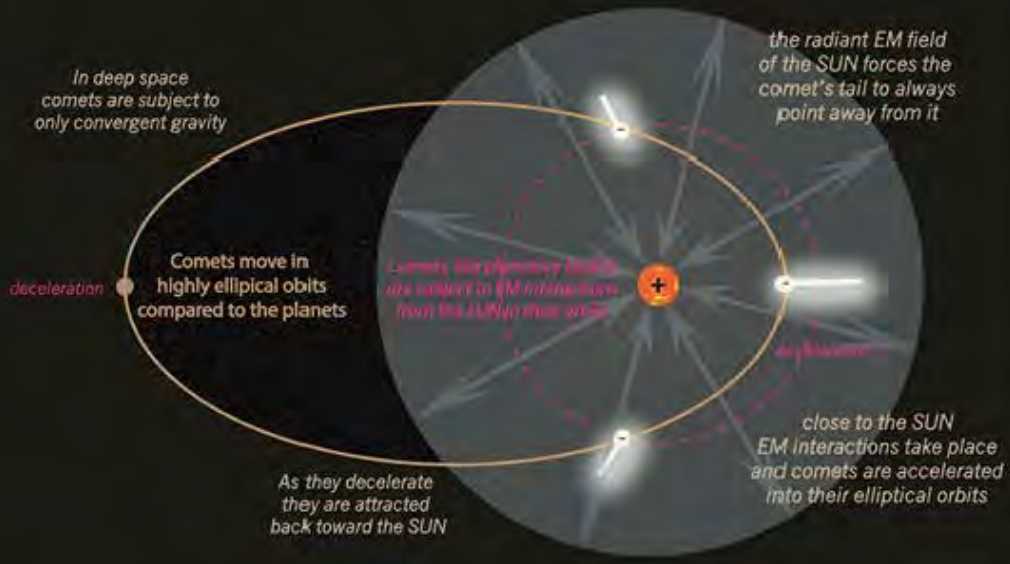
The unexplained ability of a relatively minuscule comet nucleus to hold in place a highly spherical coma, up to millions of miles in diameter, against the force of the solar wind;

Ejection of larger particles and "gravel" that was never anticipated under the idea that comets accreted from primordial clouds of ice, gas, and dust;

A short supply or complete absence of water and other volatiles on comets' nuclei;

The Electric Universe's model of charged solar bodies predicted the occurrence of an electrical flash in advance to the impact of a projectile into the nucleus of Comet Tempel 1 (Deep Impact.)

The Dust tail is the result of reflective ejected Matter following the comet's path throught solar system while the Ion tail is the result of ejected charged particles of Matter and is heavily influenced by the SUN's radiated E fields



The tails of comets always point away from the Sun, so after a comet has passed the Sun it actually travels tail first

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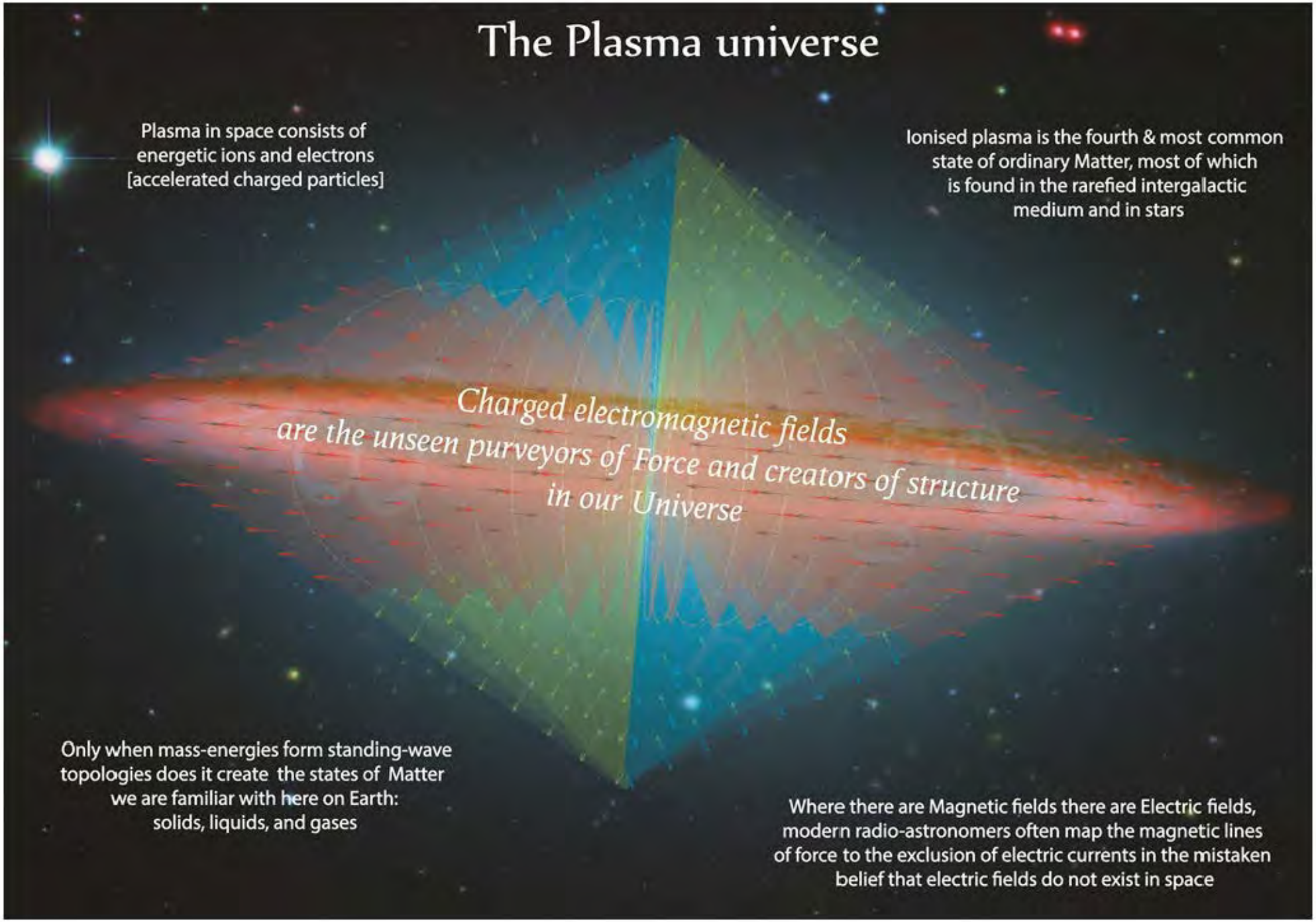
The Plasma universe
Plasma in space consists of energetic ions and electrons [accelerated charged particles]
Ionised plasma is the fourth & most common state of ordinary Matter, most of which is found in the rarefied intergalactic medium and in stars
Charged electromagnetic fields are the unseen purveyors of Force and creators of structure in our Universe
Only when mass-energies form standing-wave topologies does it create the states of Matter we are familiar with here on Earth: solids, liquids, and gases
Where there are Magnetic fields there are Electric fields, modern radio-astronomers often map the magnetic lines of force to the exclusion of electric currents in the mistaken belief that electric fields do not exist in space

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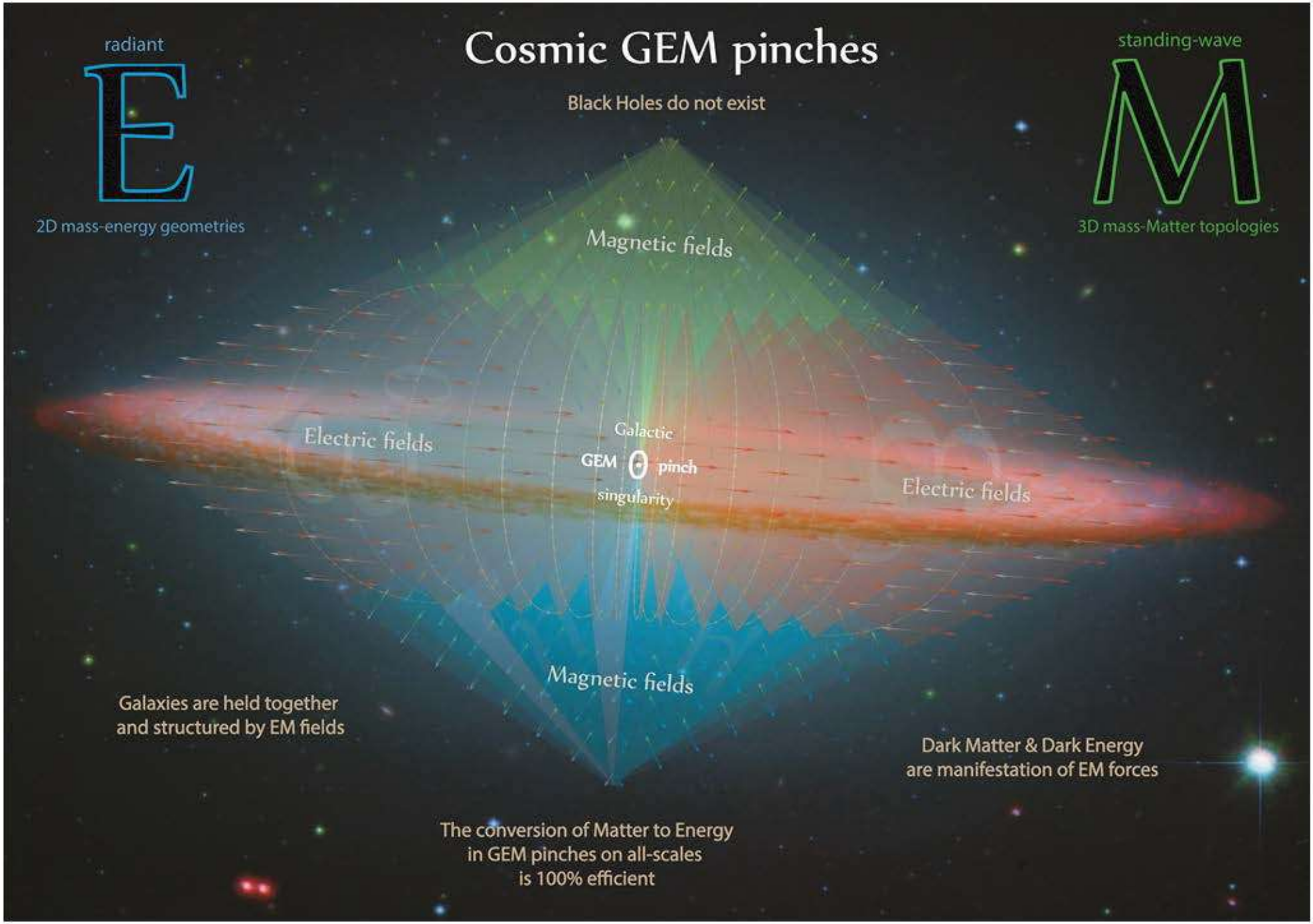

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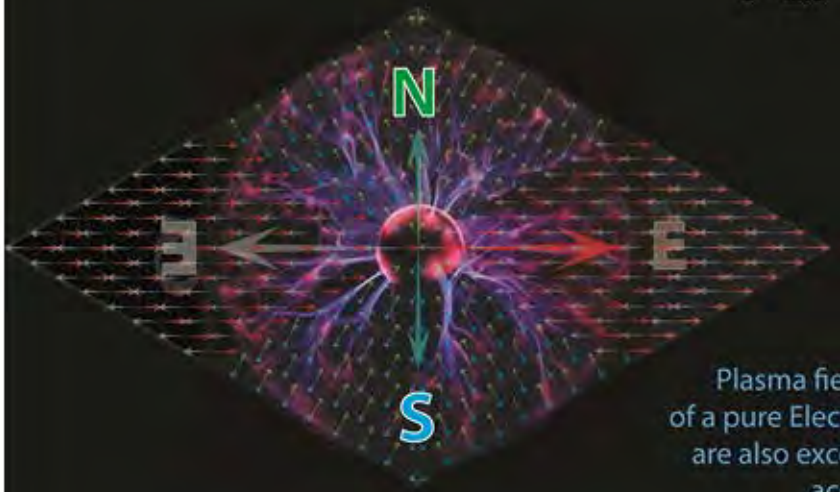
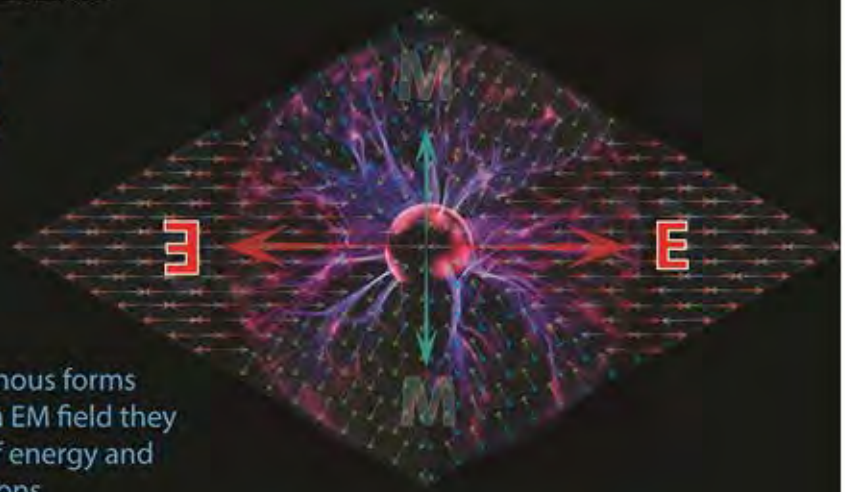
PLASMA FIELDS

The Cosmos is electromagnetic in nature





Plasma fields create the most tenous forms of a pure Electrical field, and being a EM field they are also exceptional conductors of energy and accelerators of charged Ions

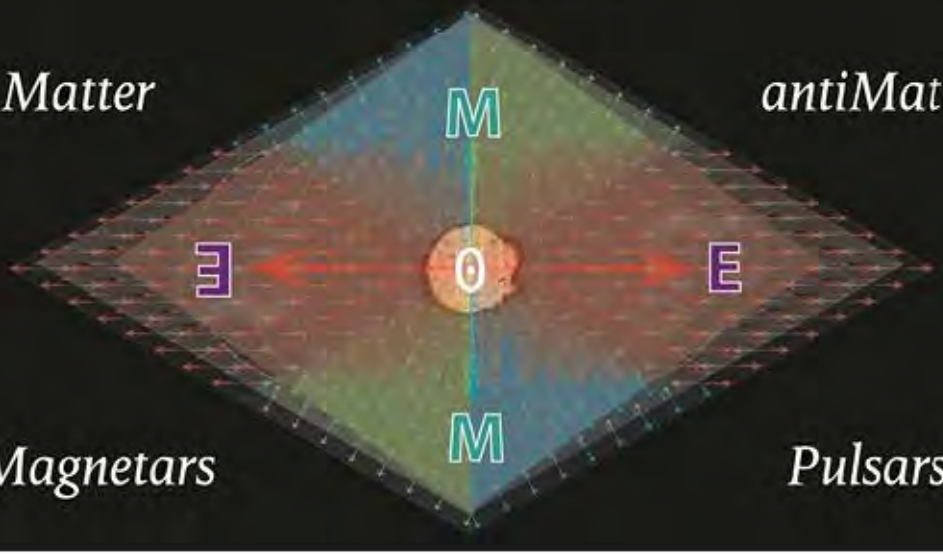
Magnetised Plasma fields
neutral electric charge EM fields
(with a magnetic magneton)

Charged Plasma fields
charged electrostatic EM fields
(with no magnetic magneton)

Neutron stars

Matter

antiMatter



Accretion discs

Gamma rays

Magnetars

Pulsars

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Neutron Stars

All Gravitational fields are comprised of quantum GEM fields

In current astrophysical theories in order to create a

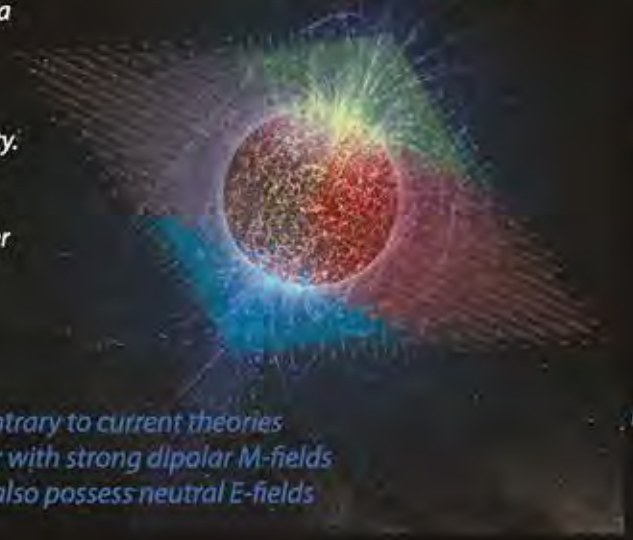
Neutron star

the central region of the star collapses under gravity.

It collapses so much that protons and electrons combine to form neutrons. and neutrogenic Matter

Hence the name "neutron star".

Typical Neutron stars have very strong M-fields



Contrary to current theories any star with strong dipolar M-fields must also possess neutral E-fields

"A neutron star is a type of remnant that can result from the gravitational collapse of a massive star during a Type II, Type Ib or Type Ic supernova event.

Such stars are composed almost entirely of neutrogenic Matter, [Neutrons, antiNeutrons and neutrinos] which against current theory act in exactly the same manner as ordinary Matter in producing spectral lines.

"Neutron stars are very hot and are supported against further collapse because of the Pauli exclusion principle.

This principle states that no two neutrons (or any other fermionic particle) can occupy the same place and quantum state simultaneously"

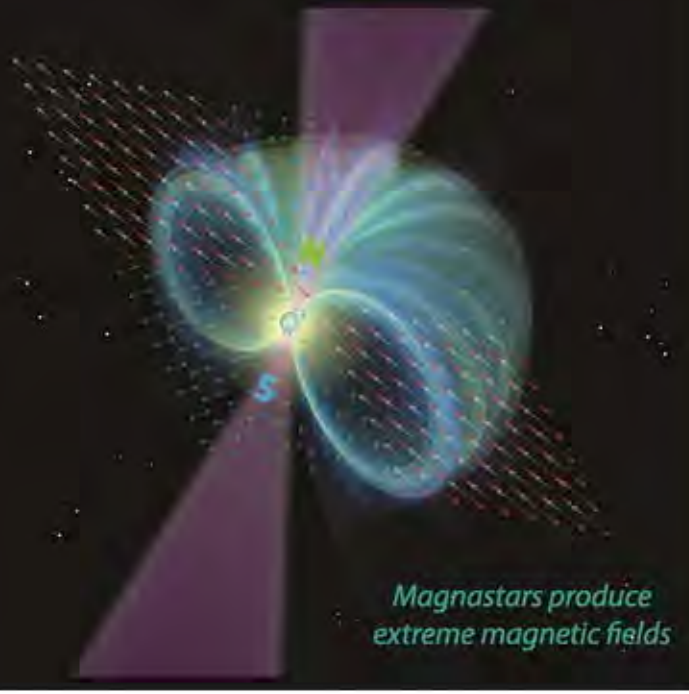
As shown throughout Tetryonic theory Neutron stars can be formed comprised completely of 'Neutral Matter'

Neutral Matter is comprised of Neutron - anti-Neutron - Neutrino atomic nuclei

Neutral matter atoms function identically to normal matter-antimatter particle topologies and releases energy in the form of photons

The gravitational collapse of any stellar material must overcome the radiant EM energies that it releases

Pulsars are non-neutral stellar objects that have weak M-fields but emit extremely strong E-field radiation as they collapse



Magnastars produce extreme magnetic fields

Neutral matter in Neutron stars experience the same ElectroMagnetic forces as normal matter and anti-matter stars but have differing charge arrangements

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Neutronium formation

Neutrons & neutrinos

Neutronium is a proposed name for a substance composed entirely of Neutrons & neutrinos

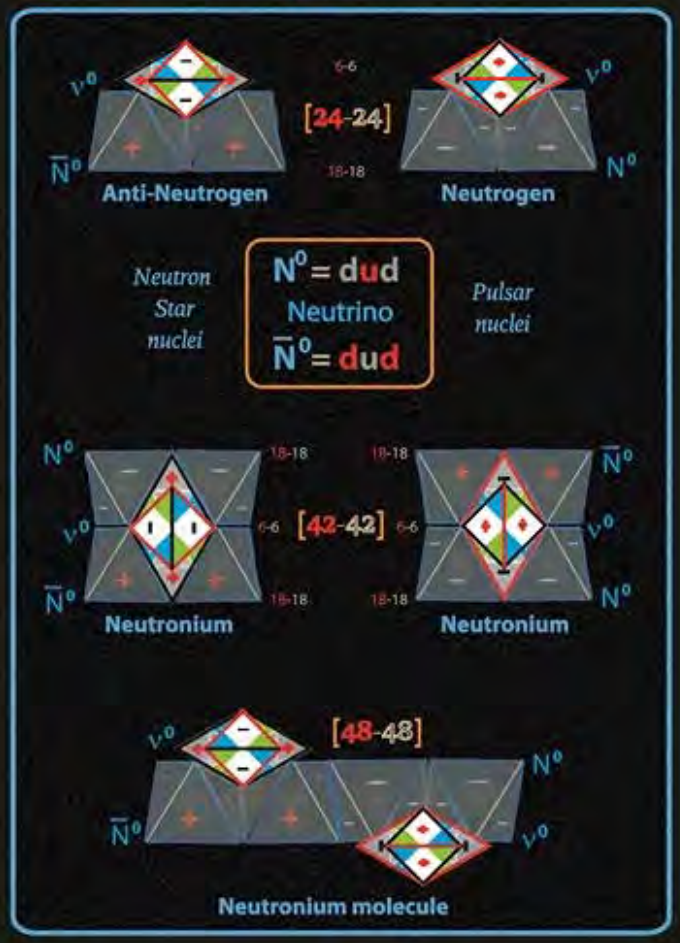
Neutron degeneracy

As a star collapses, the Fermi energy of the electrons increases to the point where it is energetically favorable for them to combine with protons to produce neutrons (via inverse beta decay, also termed "neutralization" and electron capture)

This, as shown through Tetryonic geometry, is incorrect

Neutrons are NOT comprised of Protons with electrons fused into them under pressure

Gravitational fields are comprised of convergent gravity and interactive EM fields



"The gravitational field at the star's surface is about 2×10^11 times stronger than on Earth.

Such a strong gravitational field acts as a gravitational lens and bends the radiation emitted by the star such that parts of the normally invisible rear surface become visible"

Photons and EM waves are REFACTED by EM fields
NOT bent by gravity as currently hypothesized

Neutronium

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta; mass; velocity

The neutral nuclei of neutron stars emit exactly the same light as normal stars do

Neutron stars are made of neutronium nuclei

A neutron star is a type of stellar remnant that can result from the gravitational collapse of a massive star during a Type II, Type Ib or Type Ic supernova event.

Such stars are composed almost entirely of neutrons, which are subatomic particles without electrical charge and with the same mass-Matter as protons. Neutron stars are very hot and are supported against further collapse by quantum degeneracy pressure due to the Pauli exclusion principle.

This principle states that no two neutrons (or any other fermionic particles) can occupy the same place and quantum state simultaneously

N^0 ν^0

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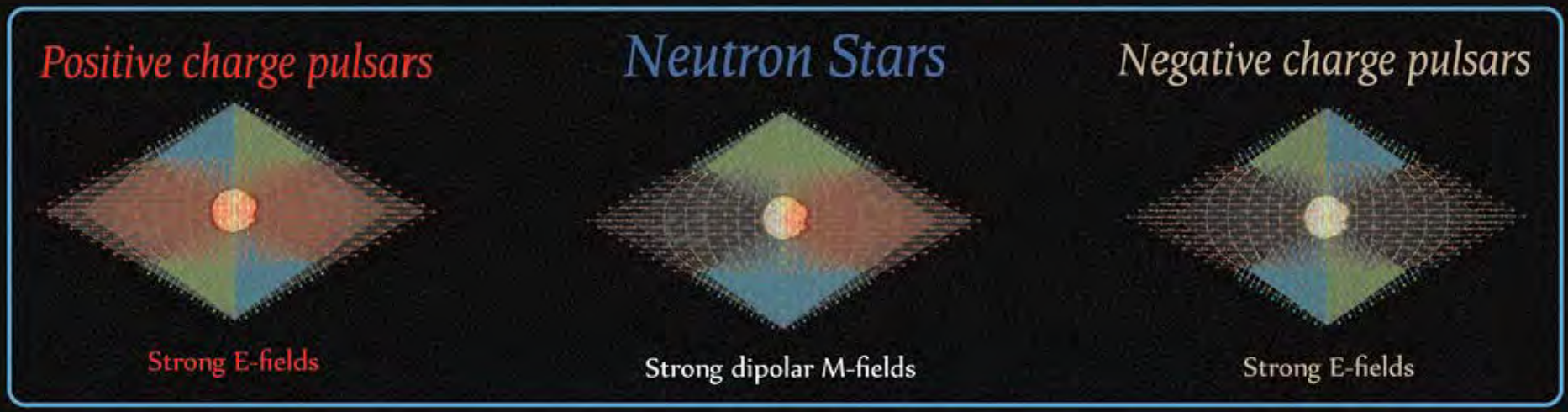
Equilateral Planck geometries create elementary charge topologies

Neutron star types

Neutron stars comprise one of the possible evolutionary end-points for stars, they are compact stellar objects measuring between 10 and 20 km across with intense magnetic fields around 10^12 times that of the Earth

Like all forms of Matter, neutron stars are formed from 3 distinct charge flavours of Matter

Neutron stars are neutral charge pulsars



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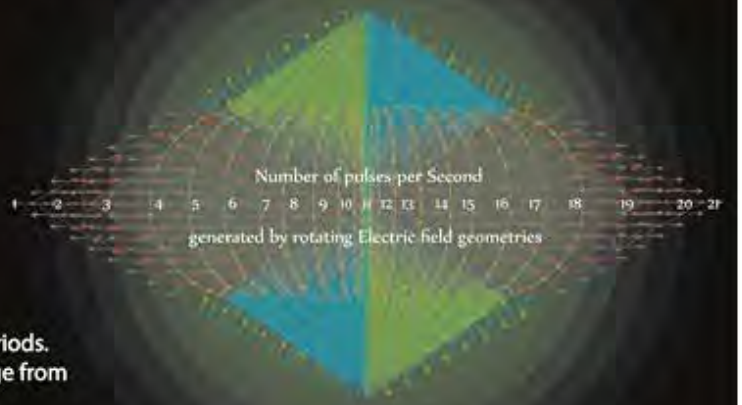
Pulsars

A pulsar is a rotating neutron star that emits a beam of electromagnetic radiation.

This radiation can only be observed when the beam of emission is pointing towards the Earth, much the way a lighthouse can only be seen when the light is pointed in the direction of an observer, and is responsible for the pulsed appearance of emission.

Pulsars are electrially charged versions of neutron stars that have weak M-fields in comparision to Neutron stars themselves



Pulsars are very dense, and have short, regular rotational periods. This produces a very precise interval between pulses that range from milliseconds to several seconds for individual pulsars

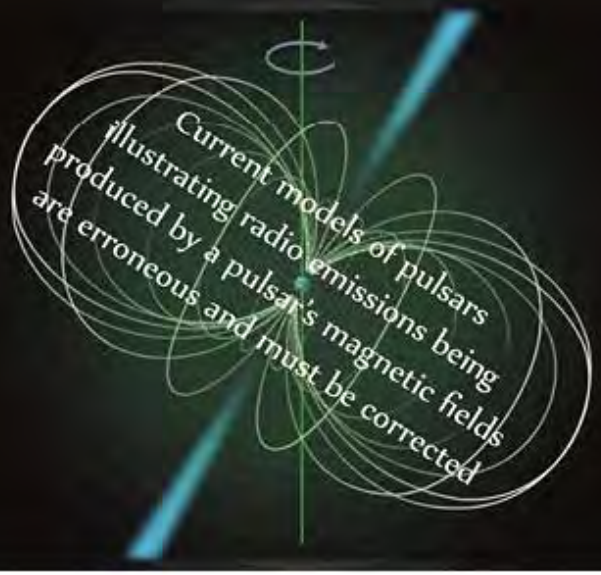
E-field waves accelerate charged particles M-fields do no work

Ampere

$$\vec{F} = q\vec{E} + q\vec{v} \times \vec{B}$$

Electric force *Magnetic field*

Lorentz


Current models of pulsars illustrating radio emissions being produced by a pulsar's magnetic fields are erroneous and must be corrected

Radio wave astomony detects E-field waves of energy momenta not magnetic waves

Maxwell

Because a magnetic force is always perpendicular to the motion, the magnetic field can do no work on an isolated charge.

It can only do work indirectly, via the electric field generated by a changing magnetic field

Faraday

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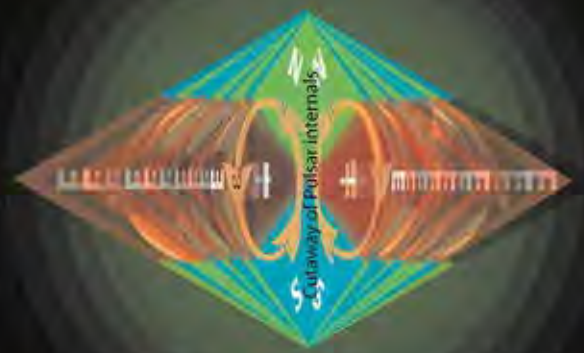
Pulsars

Are compact Matter bodies with strong GEM fields



Like all Stellar bodies their GEM fields resolve to a point at their core

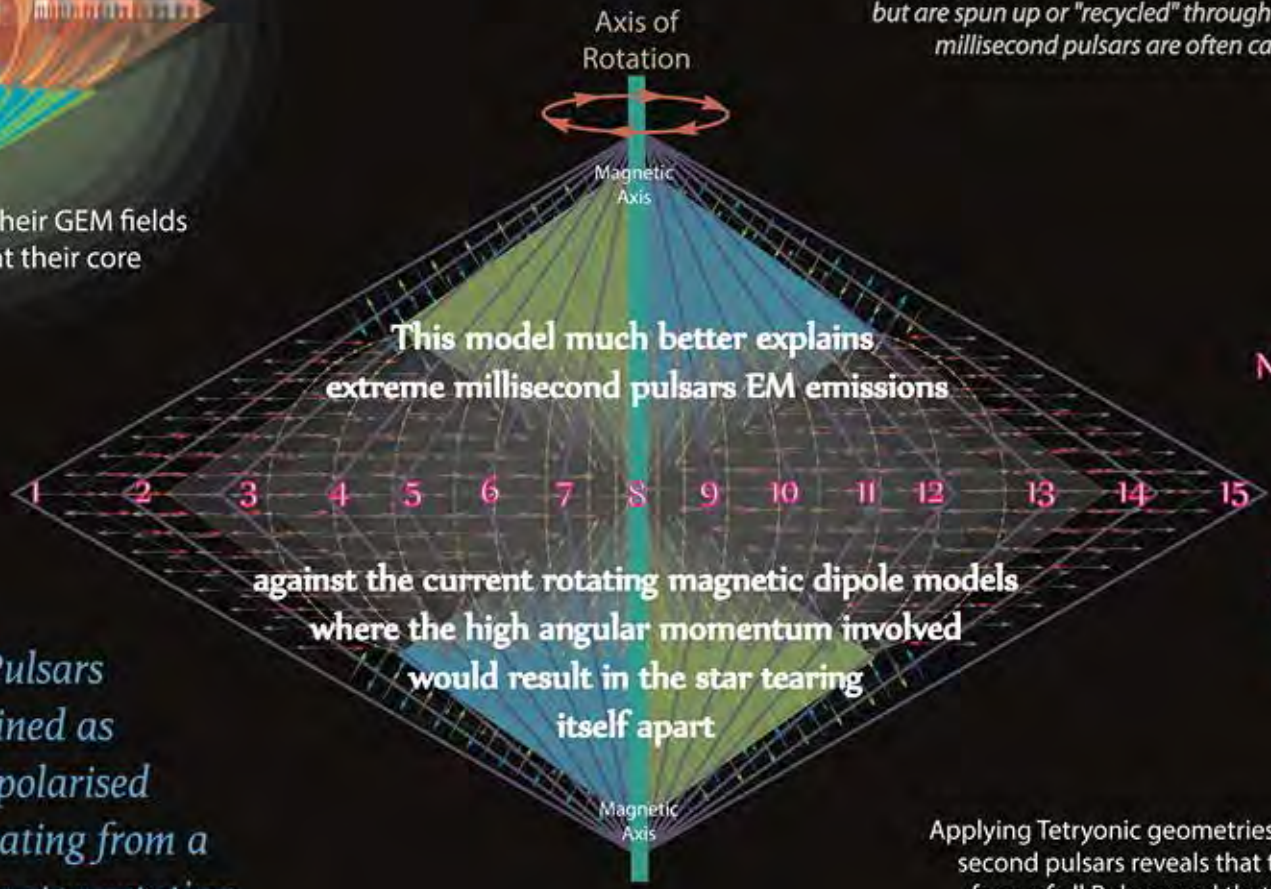
The gravitational collapse of Matter produces radiative electromagnetic waves

A millisecond pulsar (MSP) is a pulsar with a rotational period in the range of about 1-10 milliseconds.

Millisecond pulsars have been detected in the radio, X-ray, and gamma ray portions of the electromagnetic spectrum.

The origin of millisecond pulsars is still unknown.

The leading theory is that they begin life as longer period pulsars but are spun up or "recycled" through accretion. For this reason, millisecond pulsars are often called recycled pulsars.



This model much better explains extreme millisecond pulsars EM emissions

Number of Pulses per Second

against the current rotating magnetic dipole models where the high angular momentum involved would result in the star tearing itself apart

Radio wave astomony detects E-field energy momenta impulses not magnetic waves

Millisecond Pulsars are best explained as the detection of polarised Electric fields originating from a non-charged Neutron star rotating with high angular momentum

Applying Tetryonic geometries to the question of milli-second pulsars reveals that they are the formative form of all Pulsars and that over time they slow down to become the observed longer period pulsars [obeying the conservation of Angular momentum law]

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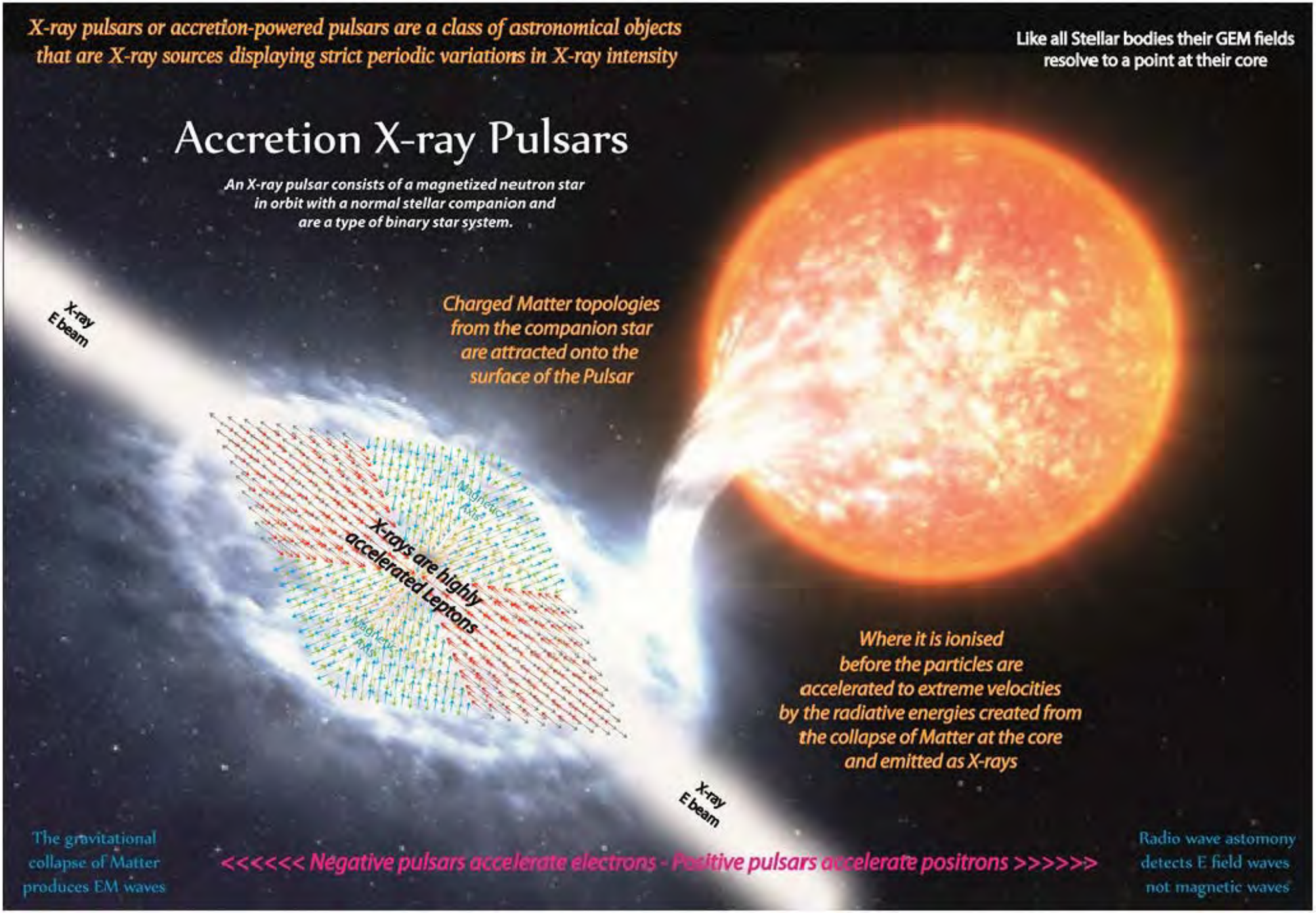
X-ray pulsars or accretion-powered pulsars are a class of astronomical objects that are X-ray sources displaying strict periodic variations in X-ray intensity
Like all Stellar bodies their GEM fields resolve to a point at their core
Accretion X-ray Pulsars
An X-ray pulsar consists of a magnetized neutron star in orbit with a normal stellar companion and are a type of binary star system.
X-ray E beam
Charged Matter topologies from the companion star are attracted onto the surface of the Pulsar
Magnetic Axis
X-rays are highly accelerated Leptons
Magnetic Axis
Where it is ionised before the particles are accelerated to extreme velocities by the radiative energies created from the collapse of Matter at the core and emitted as X-rays
X-ray E beam
The gravitational collapse of Matter produces EM waves
<<<<<< Negative pulsars accelerate electrons - Positive pulsars accelerate positrons >>>>>>
Radio wave astomony detects E field waves not magnetic waves

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Stellar Novae

Novae are cataclysmic nuclear explosions in a white dwarf star.

It is caused by the accretion of hydrogen on to the surface of the star, which ignites and starts a runaway nuclear 'fusion' process

Novae are cataclysmic stellar phenomena that take place in binary systems consisting of a compact stellar object and a low-mass star.

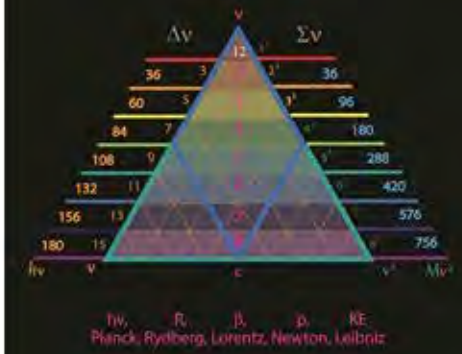
the size of a planet
but with a mass of up to
1.4 times that of the Sun

All stellar 'fusion' processes are in fact GEM pinches that convert standing wave Matter into radiant mass-energy

The stars must be close enough for the intense gravitational field of the white dwarf to tear material away from the outer layers of its companion.

photons of energy momenta
form kEM fields that accelerate
ions and electrons

spectral
line transitions



all elemental spectral lines
are the result of accelerating
photo-electrons

Novae break accreted Matter into its constituent Deuterium nuclei
and then irradiate the nuclei to higher energy levels
with radiant EM energies produced by their EMP cores

runaway
Matter-energy conversion
within the supernova

12	*Lyman*
48	*Balmer*
108	*Paschen*
192	*Brackett*
300	*Pfund*
432	*Humphries*
588	*un-named*
768	*ionised leptons*

accelerates ions & photo-electrons
producing spectral line emissions
and creates gamma ray bursts

An enigma that has puzzled experts for over 50 years is the origin of the irregular, inhomogeneous distribution of nova ejecta

The material transferred by the companion star is often of solar composition (i.e., close to 98% hydrogen and helium by mass).

Elements, in the range between carbon (C) and calcium (Ca) on the periodic table, can account for 30% to 50% of the material ejected during a nova explosion.

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Supernovae explosions

Supernovae are extremely luminous and cause a burst of radiation that often briefly outshines an entire galaxy,

The GEM pinching [collapse of Matter waveforms]
always results in divergent neutral charge
KEM mass-energies

All Matter particles
are standing wave
mass-energy topologies

The gravitational attraction of Matter
is many orders of magnitude weaker
than that of divergent KEM energies
and ceases upon Matter's collapse into
radiant mass-energy geometries

If the EM pinch at the core of a Star rapidly increases its efficiency or loses its ability to confine the resultant KEM energies the star will be blasted apart

stellar core
GEM θ pinch
collapse

Black holes, hypothesied in physics as a solution to the math of Einstein's General relativity since it was was first formulated in 1915, do NOT exist

All their physics are provided for by GEM pinch field mechanics

A star moving in a ElectroMagnetic
vacuum energy environment will be subject
to changes in the energy density of the
surrounding vacuum energies

The energy released as a result of the
collapse of Matter topologies in the
core of a supernova is as efficient as
Matter-antiMatter annihilation

Supernovae are created by the sudden disruption of the counter balanced convergent and radiative
mass-ENERGY-Matter output of GEM pinch singularities at the core of compact stellar objects
which results in the sudden release of massive amounts of divergent mass-energy
all at once from the stellar core blasting away the remaining stellar Matter

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Singularities

Current theories based on mathematical modelling of General relativity without accurate quantum mechanical models predicts that at densities greater than those supported by fermion degeneracy, gravity overwhelms all other forces collapsing the 3D material body of a large star to create a singularity and the eventual formation of a black hole.

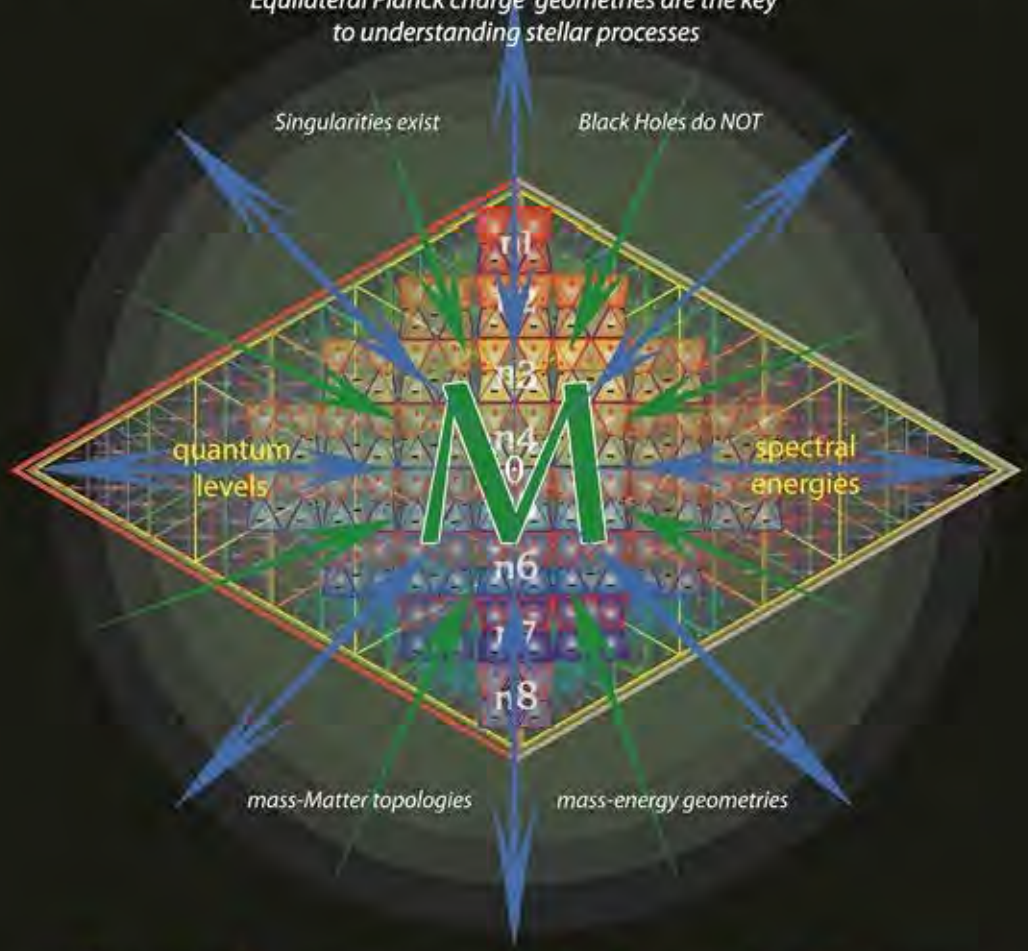
A gravitational singularity or spacetime singularity is a location where the quantities that are used to measure the gravitational electromagnetic fields become infinite in a way that does not depend on the spatial co-ordinate system

Just as the radiative KEM fields of Matter in motion and charged EM fields gives rise to the modern physics misconceptions of spherical point particles and String theories

Tetryonic theory precludes point particles and black holes through analytic mass-energy geometries & Gaussian Matter topologies that result from equilateral Planck energy momenta interactions

The collapse of 3D Matter releases its standing-wave energies as radiant 2D mass-energies foms the basis for all Stellar energy releases

Equilateral Planck charge geometries are the key to understanding stellar processes



The smallest quanta of 3D Matter is a Tetryon

(any attempt to reduce its 3 spatial dimensions results in its collapse into 2D divergent mass-energy waveforms)

Tracing the GravitoElectroMagnetic fields of Matter back to their origin point can give rise to the misconception of a EM field singularity leading to a black hole

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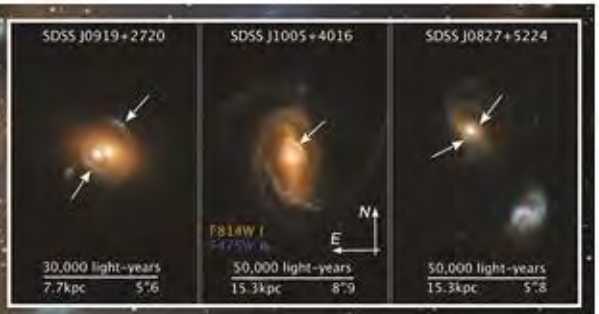
Black holes do not exist

Quasi-stellar objects

As standing-wave Matter is converted to radiant EM masses and pure energy the outputs of GEM pinches can increase dramatically over short periods



A quasi-stellar radio source ("quasar") is a very energetic and distant active galactic nucleus.

Quasars and Blazars are extremely luminous and were first identified as being high redshift sources of electromagnetic energy, including radio waves and visible light, that were point-like, similar to stars, rather than extended sources similar to galaxies

Long hypothesised as having supermassive Blackholes at their cores Tetryonics reveals Matter~Energy GEM pinches to be the source of the observed, distant large-scale stellar dynamics

The central 'core' point singularity of any GEM pinch is completely invisible and is revealed only by its effects on Matter through its interactive EM fields

All Matter (comprised of charged Planck quanta) will accelerate according to their charge distributions as they interact with the divergent energies of EM pinches

mass geometries are energy per c^2

$E = mc^2$

mass-energy equivalence

Stellar GEM pinches convert Matter topologies into radiant mass-energy geometries with 100% efficiency

Matter topologies are energy per c^4

Matter-energy equivalence

$E = \frac{m}{c^2}$

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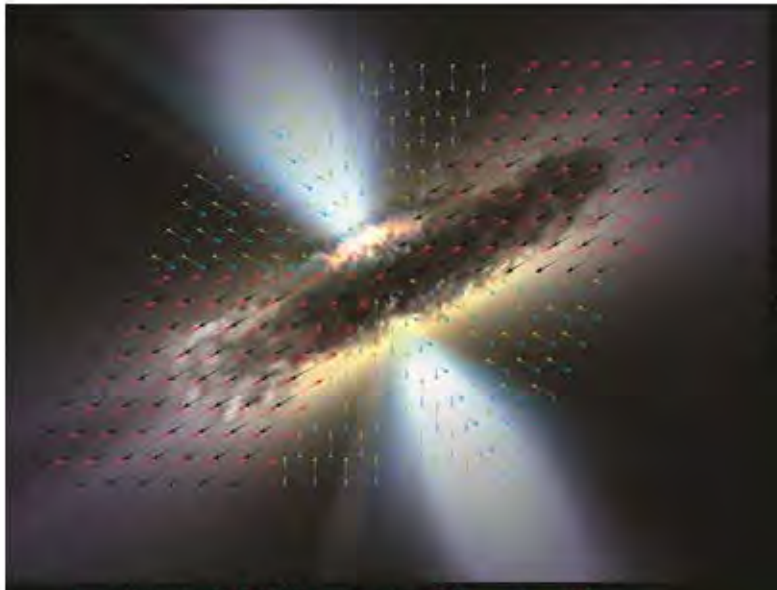
Active Galaxies



In addition to the E-field acceleration of charged particles GEM pinches can also release energies along their Magnetic axis

An active galactic nucleus (AGN) is a compact region at the centre of a galaxy that has a much higher than normal luminosity over at least some portion, and possibly all, of the electromagnetic spectrum.

The motion of stars about a central point in a galaxy's core is the result of a GEM pinch's radiated interactive forces

GR uses stress tensors to model the gravitational effects of ALL energy in a system in its various forms without distinction or differentiation between mass-energy geometries and Matter topologies

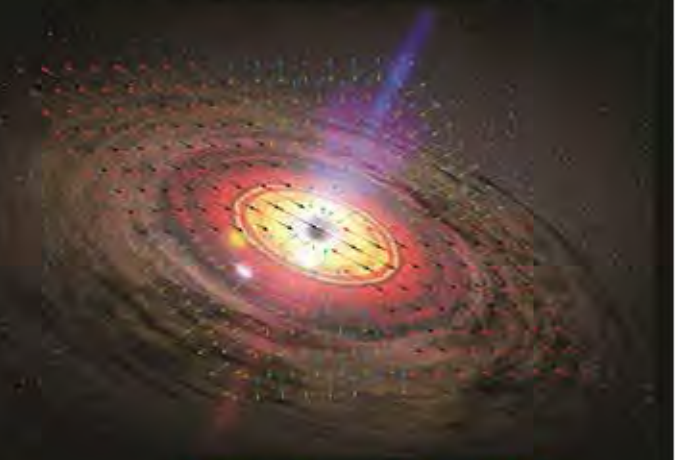
EM PINCHES ARE 100% EFFICIENT CONVERTERS OF MATTER INTO ENERGY

Using Tetryonic geometry the Universe is revealed as being completely dominated by ElectroMagnetic forces, with Gravity aiding at the larger scales to help shape the differing forms of Galaxies that we see

EM PINCHES REDUCE TO SINGULARITIES AT THE FOCUS OF THEIR DIVERGENT FIELDS

Tetryonic geometry reveals divergent interactive EM masses & convegent gravitational Matter all contribute to the nett force of Gravitational fields

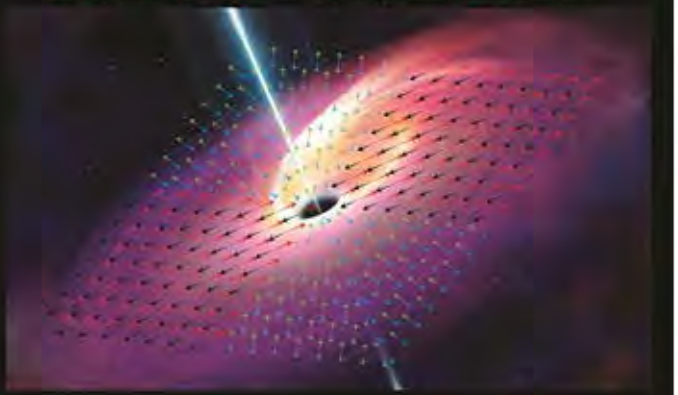
The current astrophysical models of active galaxies propose supermassive Blackholes as the only mechanism possible to produce the observed large-scale dynamics



E-fields hold Matter in a disc and M-fields release highly polarised energies

Tetryonics reveals the Galactic EM Pinches are also capable of fitting the observed data and explaining many of the current mysteries surrounding how active galaxies generate their power.

The energies released by the conversion of Matter into energy in GEM pinches is the most energetic process in the Universe



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Black holes

[Garbage IN - Garbage OUT]

Computer-based modelling of GR mathematics without charge geometries leads to paradoxial & erroneous outcomes

Tetryonics allows for Supermassive Matter to form but does NOT allow for the classically defined Black holes

In General relativity, a black hole is a region of space in which the gravitational field is so powerful that nothing, including light, can escape its gravitational pull.

The black hole has a one-way surface, called an event horizon, into which objects can fall, but out of which nothing can come. It is called "black" because it absorbs all the light that hits it, reflecting nothing, just like a perfect blackbody in thermodynamics.

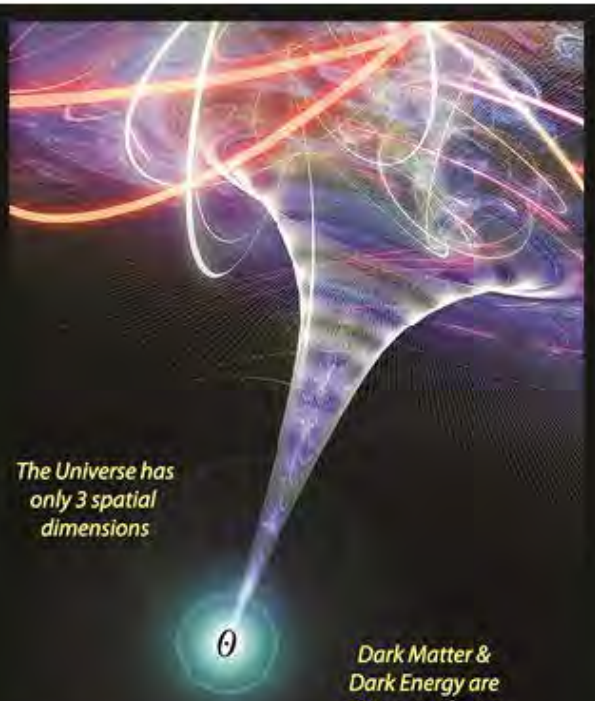
'Standard Model' quantum analysis of black holes shows them to possess a temperature and emit Hawking radiation.

In Standard Model Quantum Mechanics a problem arises in that Charge and Gravity equations break down and produce infinities and other impossible results

Very large non-radiating 'Dark Matter' would be the closest thing possible to the currently theorised black-holes.

However the 3D volume of such an object would be limited to the space taken up by its constituent Tetryonic charge Matter topologies. (ie Tetryons face-to face without Space present between any facsias)

This is similar to the current models of Neutron Stars , WIMPs and MACHOs



The Universe has only 3 spatial dimensions

Dark Matter & Dark Energy are EM vector forces

Black holes, Worm holes & other passable singularities do NOT exist

The collapse of standing-wave Matter topologies results in the release of divergent radiative mass-energy geometries

The centres of Galaxies & Quasars hypothesised as being powered by supermassive blackholes are in fact the foci of ElectroMagnetic pinches

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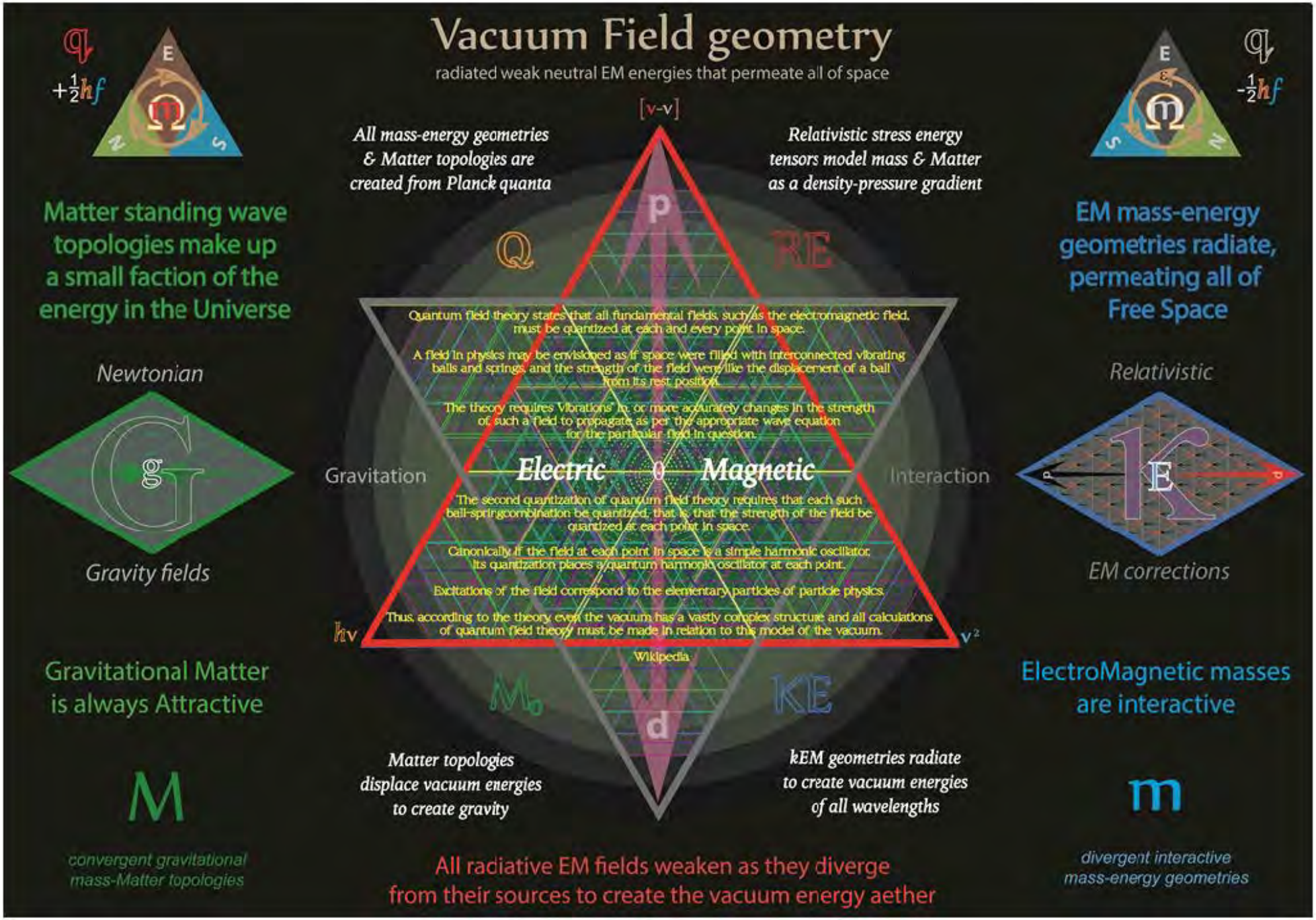
Vacuum Field geometry
radiated weak neutral EM energies that permeate all of space
[v-v]
All mass-energy geometries & Matter topologies are created from Planck quanta
Relativistic stress energy tensors model mass & Matter as a density-pressure gradient
Matter standing wave topologies make up a small faction of the energy in the Universe
EM mass-energy geometries radiate, permeating all of Free Space
Newtonian
Relativistic
Gravity fields
EM corrections
Gravitation
Interaction
Quantum field theory states that all fundamental fields, such as the electromagnetic field, must be quantized at each and every point in space.
A field in physics may be envisioned as if space were filled with interconnected vibrating balls and springs, and the strength of the field were like the displacement of a ball from its rest position.
The theory requires 'vibrations' in, or more accurately changes in the strength of such a field to propagate as per the appropriate wave equation for the particular field in question.
Electric
0
Magnetic
The second quantization of quantum field theory requires that each such ball-springcombination be quantized, that is, that the strength of the field be quantized at each point in space.
Canonically if the field at each point in space is a simple harmonic oscillator, its quantization places a quantum harmonic oscillator at each point.
Excitations of the field correspond to the elementary particles of particle physics.
Thus, according to the theory, even the vacuum has a vastly complex structure, and all calculations of quantum field theory must be made in relation to this model of the vacuum.
Wikipedia
Gravitational Matter is always Attractive
ElectroMagnetic masses are interactive
Matter topologies displace vacuum energies to create gravity
kEM geometries radiate to create vacuum energies of all wavelengths
convergent gravitational mass-Matter topologies
divergent interactive mass-energy geometries
All radiative EM fields weaken as they diverge from their sources to create the vacuum energy aether

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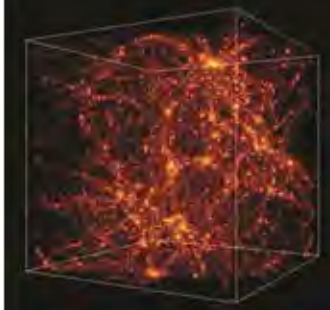
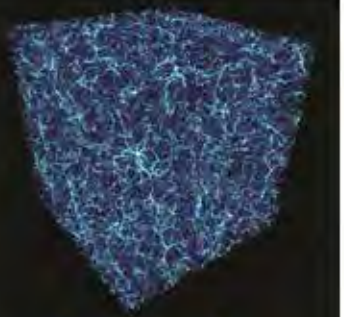
The Big Bang theory



The Big Bang is a considered to be a well-tested scientific theory which is widely accepted within the scientific community because it is the most accurate and comprehensive explanation for the full range of phenomena astronomers observe.



The framework for the Big Bang model relies on Albert Einstein's general relativity and on simplifying assumptions such as homogeneity and isotropy of space.

Primodial Atom

According to the Big Bang theory, the Universe was once in an extremely hot and dense state which expanded rapidly

The Big Crunch

If the mass density of the Universe were greater than the critical density, then the Universe would reach a rmaximum size and then begin to collapse.

It would become denser and hotter again, ending with a state similar to that in which it started

The equations of classical General relativity indicate a singularity at the origin of cosmic time, and while the Big Bang model is well accepted in modern cosmology, Tetryonics provides a clear causal model for the origin of all mass-energy-Matter and fields of force in our Universe, offering a unified, determinsitic explaination of all its field interactions and ultimate energy fate.

Gravitation — Interaction

Tetryonics relates Time to changing equilateral QAM [Planck] geometries in a dynamic evolving Universe. Moreover, general relativity must break down before the Universe reaches the Planck temperature while Tetryonics provides a unified explanation for the mechanics of the Universe

Big Bang

Extrapolation of the expansion of the Universe backwards in time using general relativity yields an infinite density and temperature at a finite time in the past, which it is proposed underwent a explosive birth and a period of rapid expansion in order to produce the homognetity currently observed.

The Big Chill

The heat death of the universe is a suggested ultimate fate of the universe, in which the universe has diminished to a state of no thermodynamic free energy and therefore can no longer sustain motion or life.

Inflation

Energy death

The Big Bang theory is the prevailing cosmological model that attempts to explain the early development of the Universe

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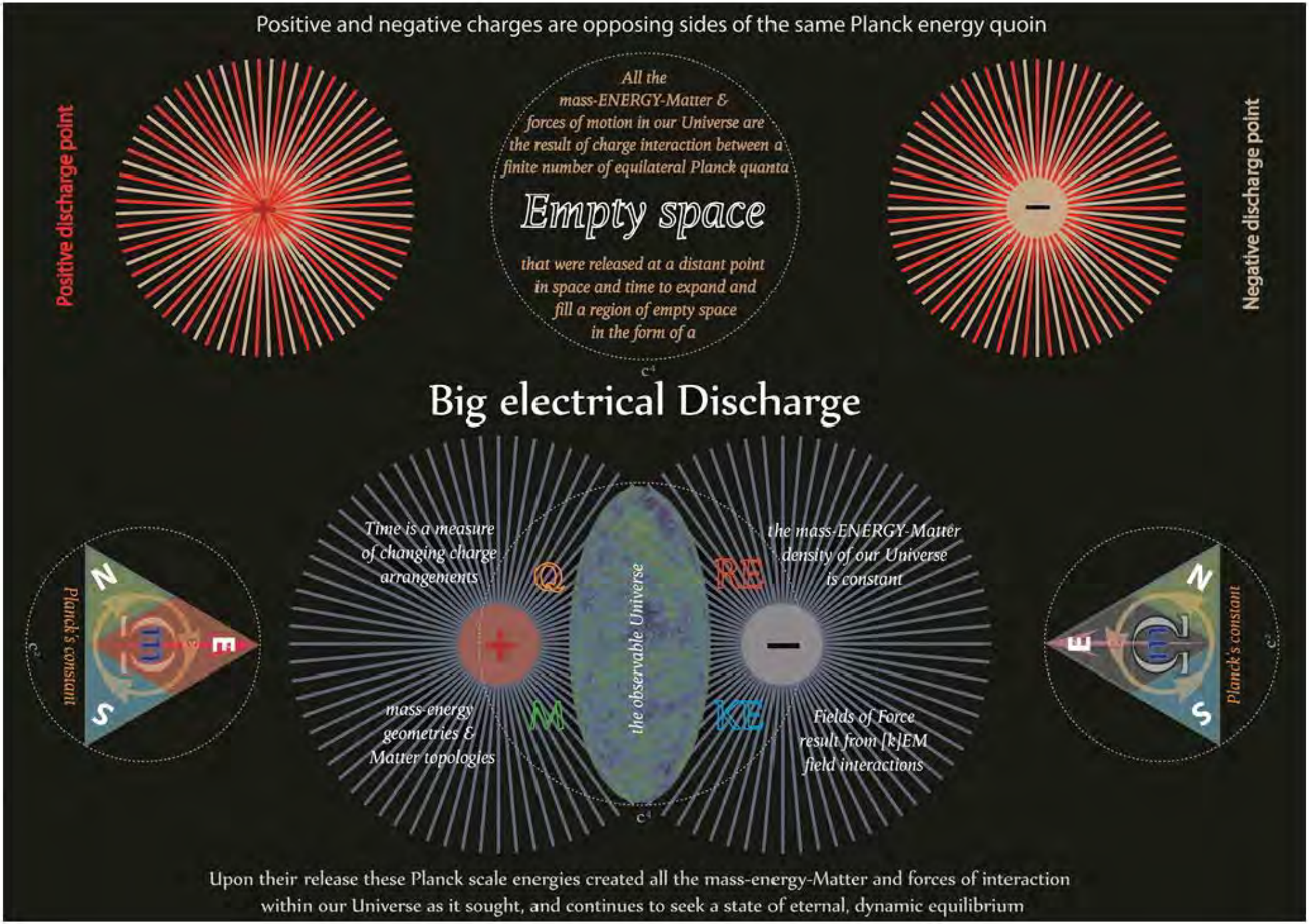
Positive and negative charges are opposing sides of the same Planck energy quoin
Positive discharge point
Negative discharge point
All the mass-ENERGY-Matter & forces of motion in our Universe are the result of charge interaction between a finite number of equilateral Planck quanta
Empty space
that were released at a distant point in space and time to expand and fill a region of empty space in the form of a
c⁴
Big electrical Discharge
Time is a measure of changing charge arrangements
Q
the mass-ENERGY-Matter density of our Universe is constant
RE
the observable Universe
mass-energy geometries & Matter topologies
M
KE
Fields of Force result from [k]EM field interactions
Planck's constant
c²
N
S
E
m
G
Upon their release these Planck scale energies created all the mass-energy-Matter and forces of interaction within our Universe as it sought, and continues to seek a state of eternal, dynamic equilibrium

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The Dynamic Universe

Like a living breathing Organism, the Universe can now be seen as an eternally dynamic system that is constantly evolving through Matter creation, EM interactions & Matter destruction

Gravitational contraction

Singularities

arise from the vector modelling of convergent EM fields of force without an understanding of the EM energy momenta geometries

The formation of Matter creates regions of attractive low vacuum energy pressure

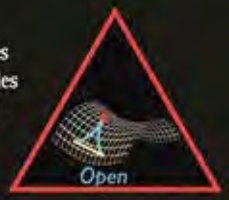
[Convergent Gravity]

Dark Matter

results from modern modelling of convergent EM interactions without an understanding of the EM energy momenta geometries

All mass-ENERGY -Matter arises from equilateral Planck energy quanta

Flat Euclidean geometries and Platonic topologies create everything



charge **Q**

Energy **RE**

The Cosmos is a dynamic, eternally evolving GEM energy environment

M mass-Matter

KE kinetics

Radiant expansion

Inflation

arises from an attempt to explain the observed homogenity of the Universe without an understanding of kEM energy momenta geometries

The collapse of standing-wave Matter releases interactive EM mass-energies

[Divergent EM Radiation]

Dark Energy

results from modern modelling of divergent EM interactions without an understanding of the EM energy momenta geometries

The energetic 'space-time fabric' of our Universe is not curved, it is created from flat Euclidean Planck quanta in a finely tuned state of dynamic equilibrium between gravitational Matter & radiant EM mass-energies

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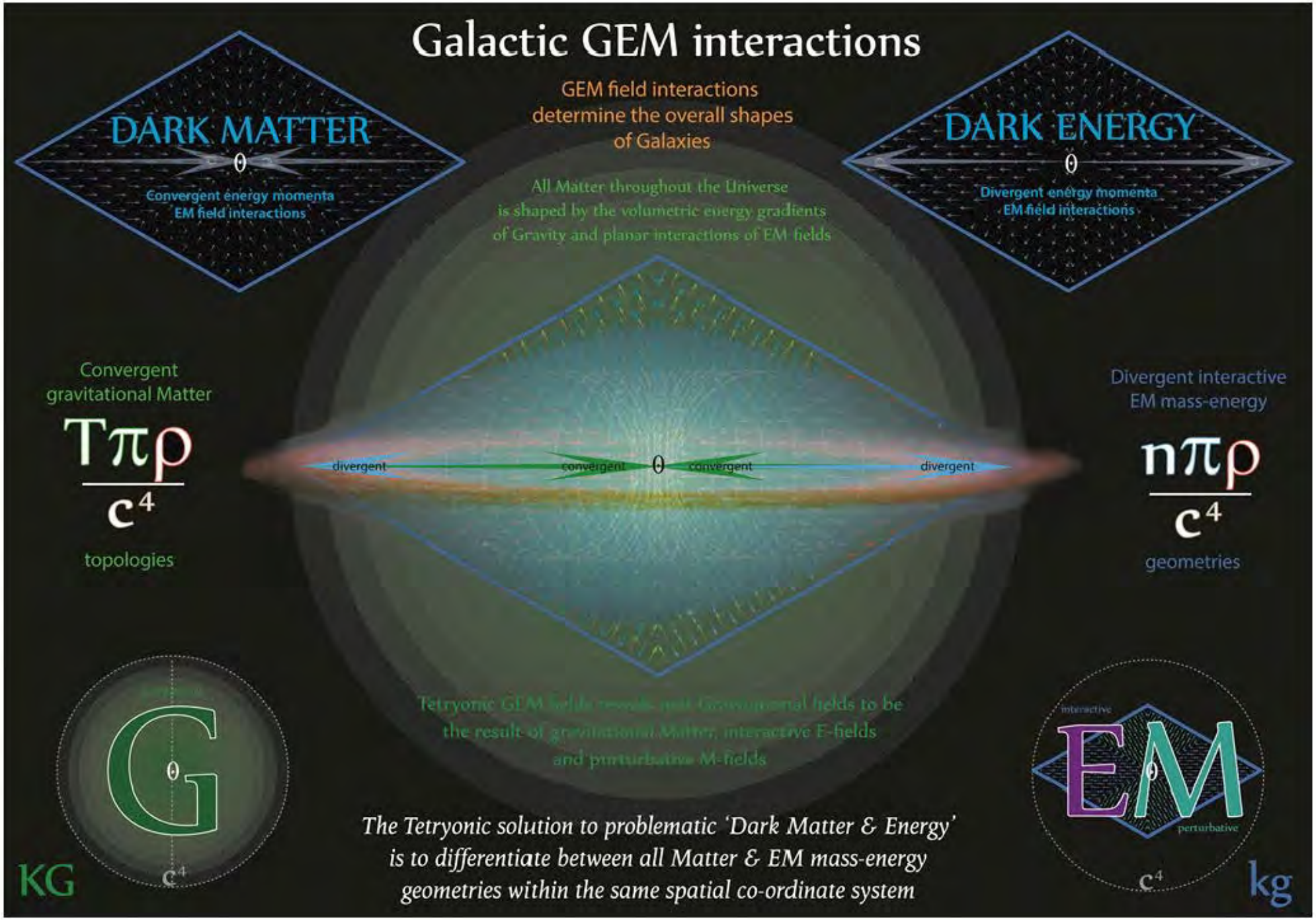

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The Dark Forces

Gravitational attraction is the result of the nullspace of Matter.
It is many orders of magnitude weaker than ElectroMagnetic forces
(Gravity does not hold the whole galaxy together)

charged energy geometries

energy momenta quanta

$$n\pi[m\Omega v]^2$$

mass velocity

$$G_{ab} + \Lambda g_{ab} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

Newtonian Gravity models the motion resulting from the attractive force between Matter

charged energy geometries create Bosons & Photons and Matter topologies

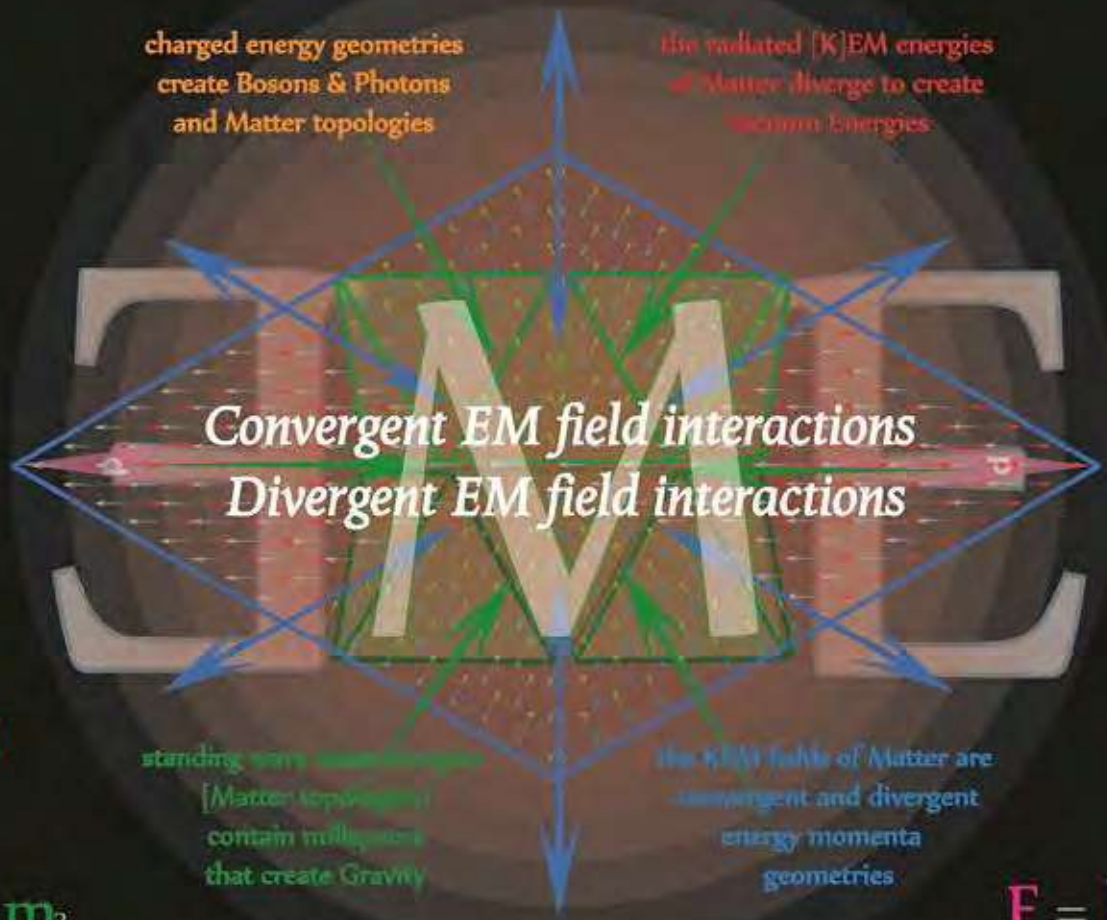
the radiated [K]EM energies of Matter diverge to create vacuum energies

General Relativity models perturbative force resulting from the total energy of any system

All [K]EM radiation has a CONVERGENT component in its interactive field that increases when Matter is in motion

DARK MATTER

or when its standing-wave Matter topology is destroyed



All [K]EM radiation has a DIVERGENT component in its interactive field that increases when Matter is in motion

DARK ENERGY

or when its standing-wave Matter topology is destroyed

$E \xrightarrow{\text{convergent energy momenta}} M$

standing wave [Matter topologies] contain mass-energies that create Gravity

the [K]EM fields of Matter are convergent and divergent energy momenta geometries

$M \xrightarrow{\text{divergent energy momenta}} E$

$$F = -G\frac{M_1 m_2}{r^2}$$

$$F = k\frac{Q_1 Q_2}{r^2}$$

Gravitational Matter is attractive

G

Tetryonics dictates that in order to correct for measured Gravitational accelerations we must distingush between EM mass and Matter and take into account all the EM forces as well as that of Gravity produced by Matter

k

ElectroMagnetic mass-energies are interactive

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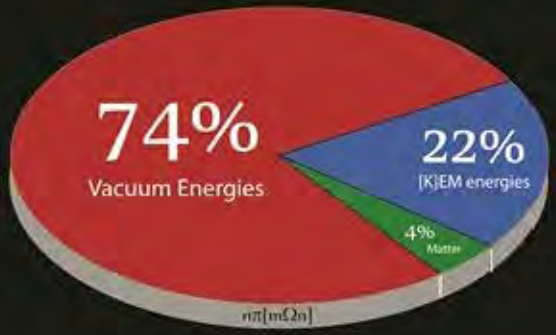
Vacuum Energies

Vacuum energy is an underlying background energy that exists in space even when it is devoid of Matter (free space) and results from the introduction of the Cosmological constant [Λ] by Albert Einstein as a modification of his original theory of General relativity in order to achieve a static universe.

Dark Matter is a measure of CONVERGENT KEM interactions additional to that of Gravity



Dark Energy is a measure of DIVERGENT KEM interactions opposing that of Gravity

He later abandoned this concept after observations of the Hubble redshift indicated that the universe might not be stationary

Gravitational Matter is always attractive

$$G_{ab} + \Lambda g_{ab} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

total system energy

ElectroMagnetic masses are always interactive

Matter

M

topologies

mass

m

geometries

Unlike Einstein's Special and General theories of Relativity that utiliizes a scalar energy density tensor, Tetryonics utilizes analytical geometry & topology to differentiate between EM mass & Matter and model all energy interactions in any spatial region

Gravity results from standing-wave Matter

Gravito-Electro-magnetic interactions

GEM

of all EM mass-ENERGY-Matter in the Universe can be defined as

$$= \frac{n\pi[m\Omega v]^2}{c^4}$$

Total energy geometries — *quantised energy momenta*

spatial volume of mass-energy-Matter interactions

EM interactions result from superpositioned EM masses

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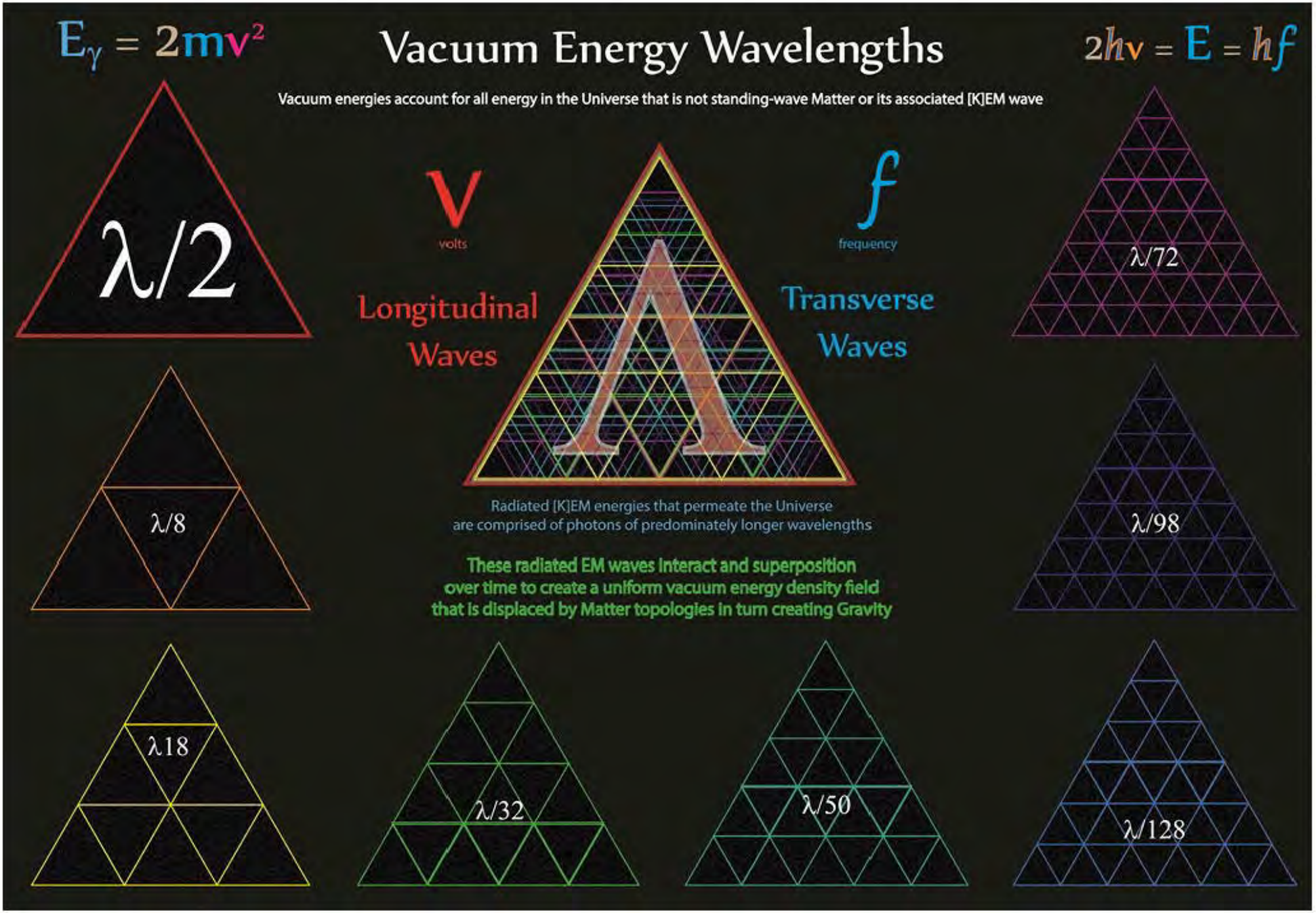

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Dark Matter is a nett attractive force that results when the Electromagnetic interactions of Matter in motion are not included in calculations

In addition to Gravity the [K]EM waves of all Matter in motion possess a convergent component which in turn creates a unidirectional 'force'

The convergent EM force component can be modelled as being the result of an 'invisible' form of Matter or additional gravitational force

DARK MATTER

Convergent EM field vector momenta

All Matter emits divergent EM radiation photons comprised of bidirectional vector momenta

Matter produces Gravity
EM waves are interactive

Dark Matter is matter that neither emits nor scatters light or other electromagnetic radiation, and so cannot be directly detected via optical or radio astronomy.

Gravity is the result of the displacement of vacuum energies by 3D Matter topologies

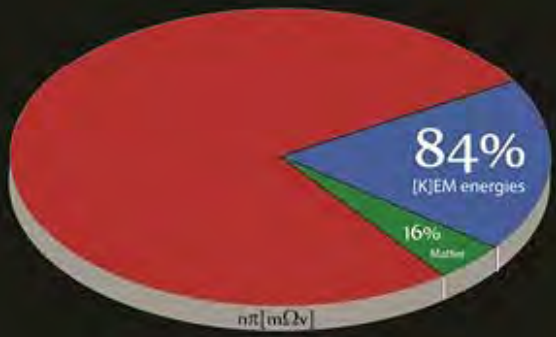
All [K]EM radiation has a convergent component in its interactive field that increases when Matter is in motion or created in the form of EM standing-wave topologies

DARK MATTER

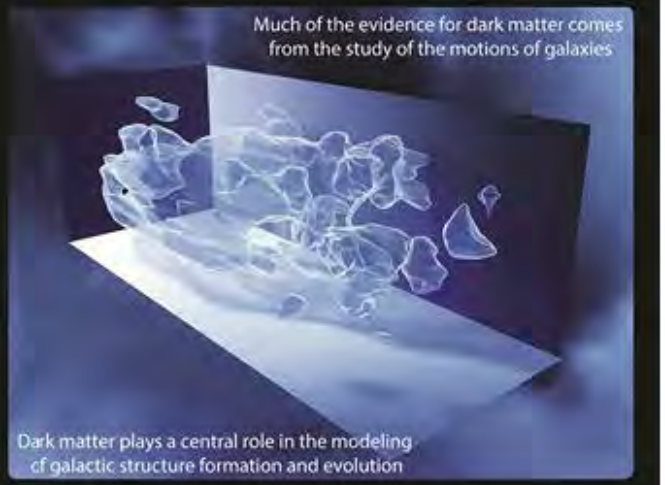
As Matter is destroyed and energy is released the attractive force of Gravity decreases but the convergent acceleration due to Dark Matter increases

Dark Matter

Dark matter is estimated to constitute 84% of the Matter in the universe and 23% of the total mass-energies



Dark Matter created by KEM field convergence contributes to the total energies of the cyclic Universe


Much of the evidence for dark matter comes from the study of the motions of galaxies
Dark matter plays a central role in the modeling of galactic structure formation and evolution

Dark Matter's existence is inferred from its gravitational effects on visible Matter and the convergent lensing of background radiation

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Galaxy Rotations

In 1986, Nobel laureate Hannes Alfven postulated at an electrical model for the solar system

The dynamic modelling of large scale Matter must take into account all forces present

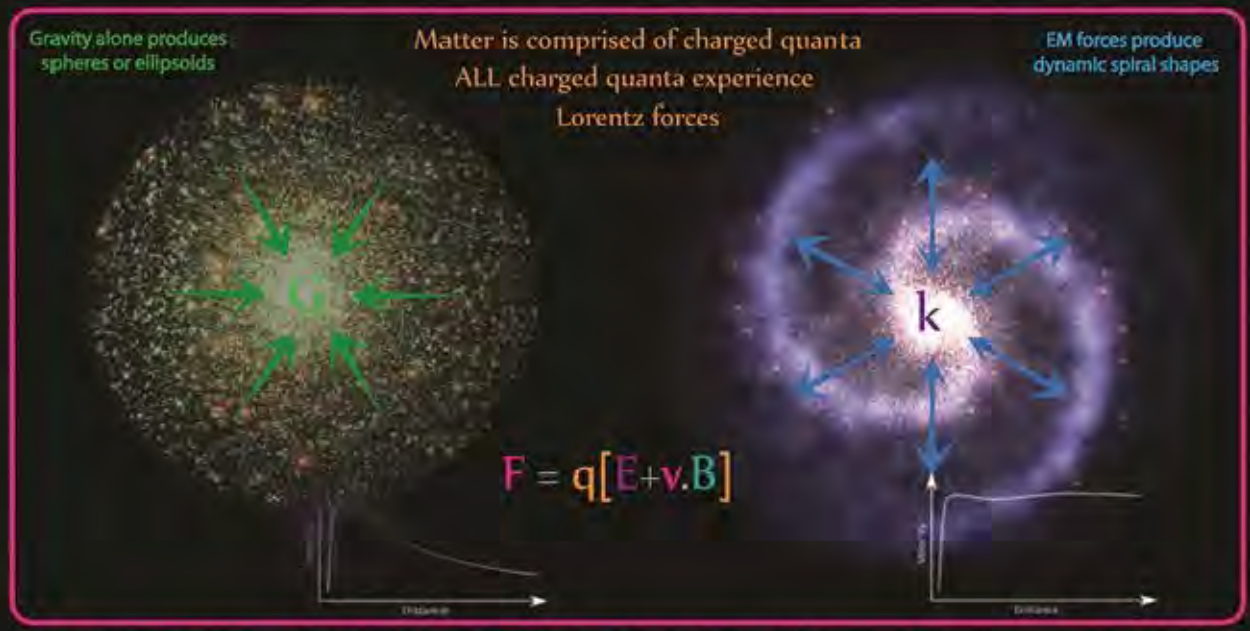
The rotation curve of a galaxy (also called a velocity curve) can be represented by a graph that plots the orbital speed (in km/s) of the stars or gas in the galaxy on the y-axis against the distance from the center of the galaxy on the x-axis

Based on Newtonian mechanics and assuming, as was originally thought, that most of the Matter of the galaxy had to be in the galactic bulge near the center, Matter (such as stars and gas) in the disk portion of a spiral should orbit the center of the galaxy similar to the way in which planets in the solar system orbit the sun, i.e. where the average orbital speed of an object any distance away from the majority of the Matter would decrease inversely with the square root of the radius of the orbit

Gravity alone produces spheres or ellipsoids

Matter is comprised of charged quanta
ALL charged quanta experience
Lorentz forces

EM forces produce dynamic spiral shapes



G

Gravitational Matter is attractive

Newtonian gravity models convergent Gravity only

SR

ElectroMagnetic mass-Energy is interactive

General relativity models interactive GEM energies

$$F = -G\frac{M_1}{r^2}$$

The curves of the rotational velocities of stars within Galaxies do not decrease in the expected inverse square root relationship but are "flat", i.e. outside of the central bulge their speed is nearly constant from the centre out of the edge of the galaxy [identical to the forces produced by homopolar motors]

$$F = k\frac{Q_1}{r^2}$$

Tetryonics dictates that we must take into account EM forces as well as Gravity in order to account for any perturbations that convergent Gravitation alone cannot account for

Observations have shown there is not sufficient visible Matter in the Universe to account for the apparent strength of gravitational forces within and between galaxies leading to the hypothesis that up to 90% of the Matter in the Universe is

Gravity alone does not hold the whole galaxy together
It is many orders of magnitude weaker than ElectroMagnetic forces

To account for the redshift–magnitude relation of type Ia supernovae General relativity requires that much of the energy in the Universe consists of a component with large negative pressure, this negative-gravity has been dubbed

Dark Matter

Gravitational attraction is the nett convergent force resulting from three distinct quantum forces

Dark Energy

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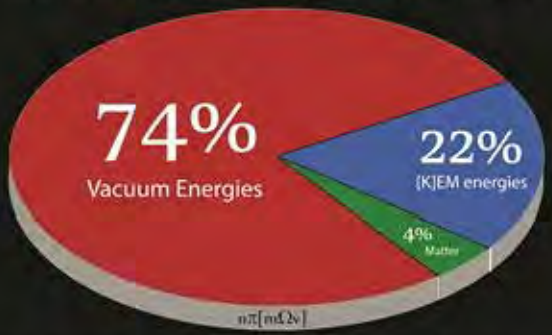
Dark Energy

Dark energy is a hypothetical form of energy that permeates all of space and tends to increase the rate of expansion of the universe.

EM mass-energies are conservative

Dark Energy is a nett repulsive force that results when Gravitational Matter topologies are destroyed by stellar GEM pinch processes

Matter is not conservative



Dark Energy is the divergent scalar field created by [K]EM field energies

2D [K]EM fields create interactive forces between Matter

The cosmological constant is physically equivalent to vacuum energy

Independent from its actual nature, dark energy would need to have a strong negative pressure (repulsive force or divergent energy opposite that of gravitational attraction) in order to explain the observed acceleration in the expansion rate of the universe.

All [K]EM radiation has a divergent component in its interactive field that increases when Matter is in motion

DARK ENERGY

or its standing-wave topology is destroyed

As Matter is destroyed and energy is released the attractive force of Gravity decreases and the divergent acceleration due to Dark Energy increases

The [K]EM fields of Matter are compressed [illegible]

DARK ENERGY

Divergent EM field interactions

The [illegible] divergent [K]EM fields contributes to the total energies of the cyclic Universe

DARK MATTER

Convergent EM field interactions

A major outstanding problem is that most quantum field theories predict a huge energy value for the quantum vacuum, more than 100 orders of magnitude too large.

This would need to be cancelled almost, but not exactly, by an equally large term of the opposite sign.

DARK ENERGY

Divergent EM field interactions

In fact a negative pressure does not influence the gravitational interaction between Matter [which remains attractive] but rather alters the overall evolution of the universe at the cosmological scale, typically resulting in the localised accelerating expansion of the universe despite the attraction between Matter present throughout the Universe.

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Energy-momenta geometry

The super-positioned EM fields of free space is comprised of Planck energy momenta

A major outstanding problem is that most quantum field theories predict a huge cosmological constant from the energy of the quantum vacuum, more than 100 orders of magnitude too large.

If the Higgs field does exist, another field with an unknown negative energy is needed to reduce the total energy in the vacuum to a slightly positive value to correspond with the current accelerated rate of expansion

Due to the equilateral asymmetry of all the energy momenta quanta in charged electromagnetic fields

Dark Energy is Divergent Vacuum Energy momenta in free Space

Summing over all possible Energy quanta at all points in space gives a large but NOT infinite quantity of energy-momenta

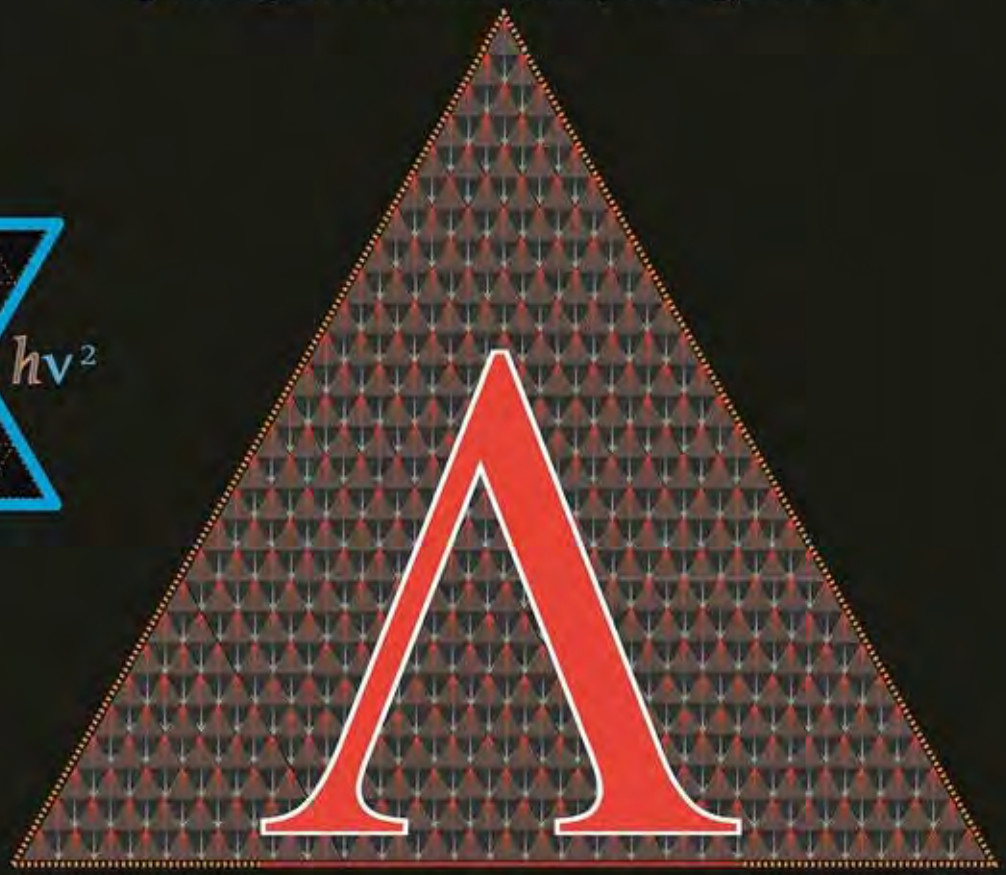
E Field Coulombic forces

convergent momenta

divergent momenta

Vacuum charge momentum

Convergent Vacuum Energy momenta in free Space is Dark Matter



1	1		1
2	3		0.666667
3	5		0.6
4	7		0.571429
5	9		0.555556
6	11		0.545455
7	13		0.538462
8	15		0.533333
9	17		0.529412
10	19		0.526316
11	21		0.52381
12	23		0.521739
13	25		0.52
14	27		0.518519
15	29		0.517241
16	31		0.516129
17	33		0.515152
18	35		0.514286
19	37		0.513514
20	39		0.512821
21	41		0.512195
22	43		0.511628
23	45		0.511111
24	47		0.510638
25	49		0.510204
26	51		0.509804
27	53		0.509434
28	55		0.509091
29	57		0.508772
30	59		0.508475

The total Vacuum Energy in any spatial region contains fields of Planck energy-momenta seeking an equalised, homgenous state

2

Divergent energy momenta always dominates over Convergent energy momenta

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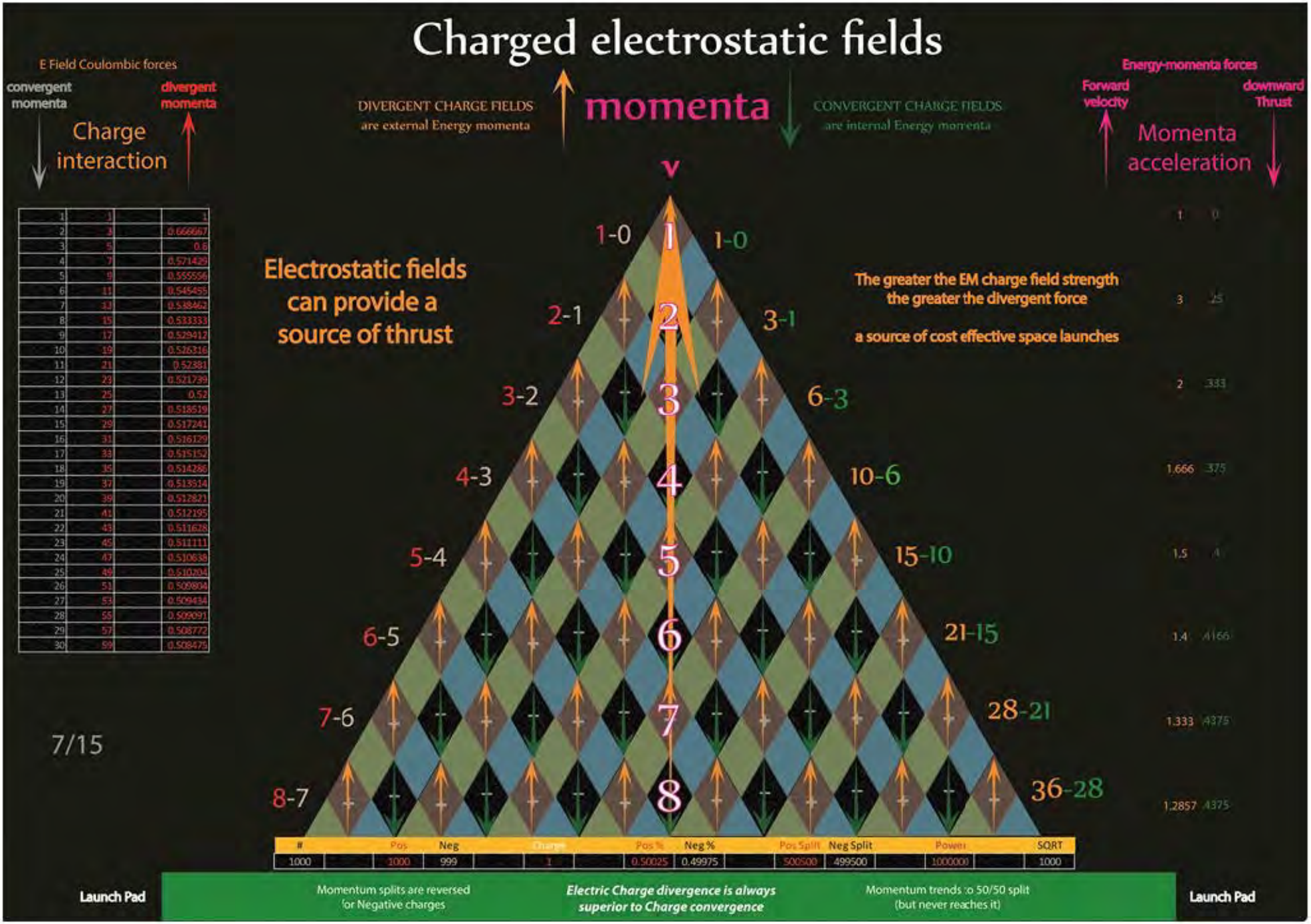

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Electrostatic lifters

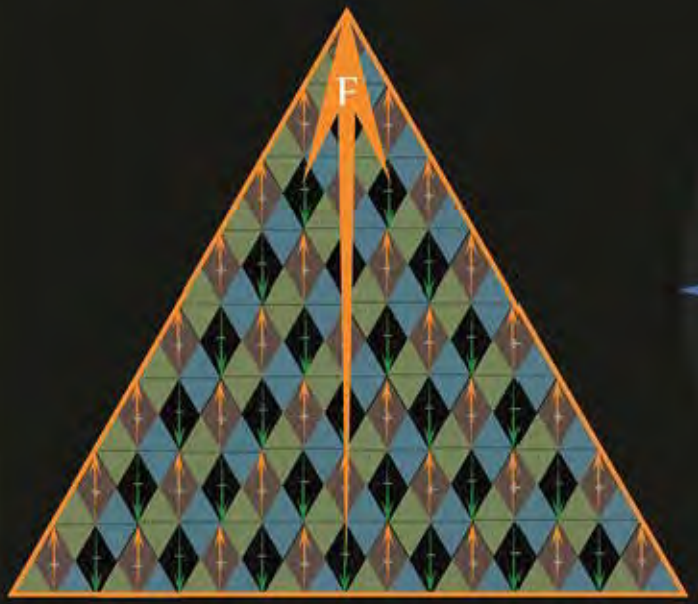
Electrostatic levitation is the process of using an electric field to levitate a charged object and counteract the effects of gravity

Electrostatic charges are always divergent from their sources

Static electricity is the result of electrostatic charges

Electrostatic charges are comprised of divergent energy momenta

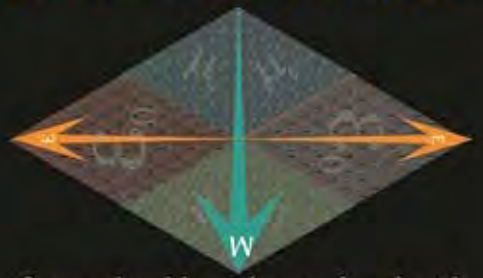
Tetryonic geometries and Coulombic forces offers an alternative means of propulsion for space lauches and frictionless transports



Charged voltage fields contain nett divergent energy momenta [Planck quanta] that can do work over distances

Interactive electromagnetic forces are vastly stronger than convergent gravity

Electrostatic levitation



forces should not be confused with

Magnetic levitation

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The Light speed barrier

BOSONS/PHOTONS
2D Planar massless particles
[EM mass-Energies]
'slice' throught the
vacuum energy aether

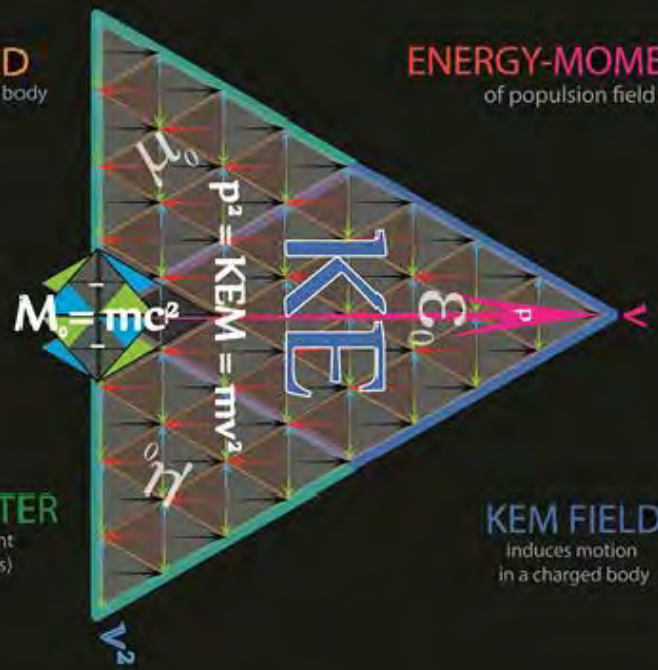
CHARGED
particle or massive body

ENERGY-MOMENTA
of populsion field

The Compton frequency of quanta
In any EM field is directly proportional
to the field's velocity of propagation

**The 'speed of Light'
is the limiting speed of
transverse EM accelerations
[it is not THE limit]**

$E = Mv^2$



$KE = \frac{1}{2}Mv^2$

MOTION VECTOR
direction of propulsion
of a charged body

REST MATTER
remains invariant
(but accelerates)

KEM FIELD
induces motion
in a charged body

TETRYONS/BARYONS
3D Tetrahedral EM Matter
[4nπ EM mass-Energies]
interact at various angles with the
vacuum energy aether

Tetryonic geometry clearly shows that here is NO limit to the energy content that can be released into any spatial region, negating the long held belief of a Light speed barrier

V

According to special relativity, c is the maximum speed at which all EM mass-Energy and information in the universe can travel.
it is predicted by General relativity to be the absolute velocity of all 'massless particles' and associated fields
- including ElectroMagnetic radiation such as Light in a vacuum.

Such particles and waves travel at c regardless of the motion of the source or the inertial frame of reference of the observer.
In the theory of relativity, c interrelates space and time, and appears in the famous equation of mass–energy equivalence E = mc2.

c

The speed at which light waves propagate in vacuum
is independent both of the motion of the wave source
and of the inertial frame of reference of the observer

$$E = n\pi\left[\left[m_{\text{mass}}\Omega v^{2}_{\text{velocity}}\right]\right]$$ (Planck quanta)

The speed of light in vacuum, usually denoted by c,
is a physical constant important in many areas of physics
and is determined by the impedance of the medium

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Inflation

While the detailed particle physics mechanisms responsible for inflation are not known, the basic picture makes a number of predictions that have been confirmed by observation.

Inflation is thus now considered part of the standard hot Big Bang cosmology

$$\text{ENERGY}\ n\pi\left[\left[\text{Planck quanta}\ m\Omega v\right]^2\right]$$

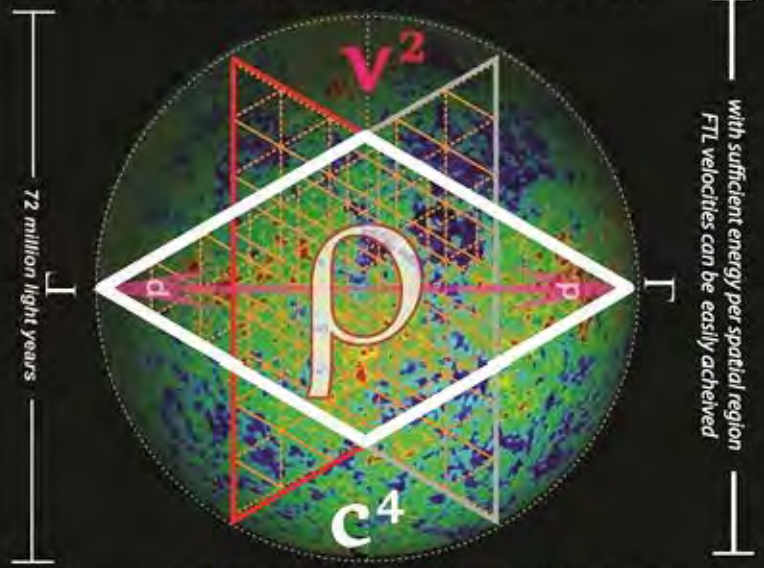
momentum; mass; velocity

Tetryonics now provides a detailed physical model of ALL ponderable Matter and its kinetics through the charged geometry of mass-ENERGY-Matter

All mass-energy propagates at a velocity directly related to the impedance of the medium

The energy in any spatial region possesses a related mass-velocity [linear momentum] component

GIVEN SUFFICIENT ENERGIES ANY REGION OF SPACE-TIME WILL UNDERGO SUPERLUMINAL EXPANSION [INFLATION]



UNTIL IT REACHES A CRITICAL ENERGY DENSITY THAT RESULTS IN THE OBSERVED SPEED OF LIGHT THAT WE NOW MEASURE

The observable Universe could have originated from a region of pure energy in it's past.

This point would have contained all the Energy that ultimately formed all the mass-Matter of the Universe and Forces that we now observe and measure in two 2D planar fields

"And God said, Let there be light: and there was light"

The planar EM Energies released at that point would have resulted in faster-than-light divergence from that point as dictated by the geometric energy-momenta velocity relationship

$$\frac{\text{mass}\ n\pi\left[\left[\text{Planck quanta}\ m\Omega v^2\right]\right]}{c^2}$$

mass; mass; velocity

It prescribes a dynamical EM Universe evolving over time

into a state of equilibrium between gravitational mass-Matter topologies and radiant, interactive mass-energy momenta geometries

$$\frac{\text{Matter}\ T\pi\left[\left[\text{Planck quanta}\ m\Omega v^2\right]\right]}{c^4}$$

mass; velocity

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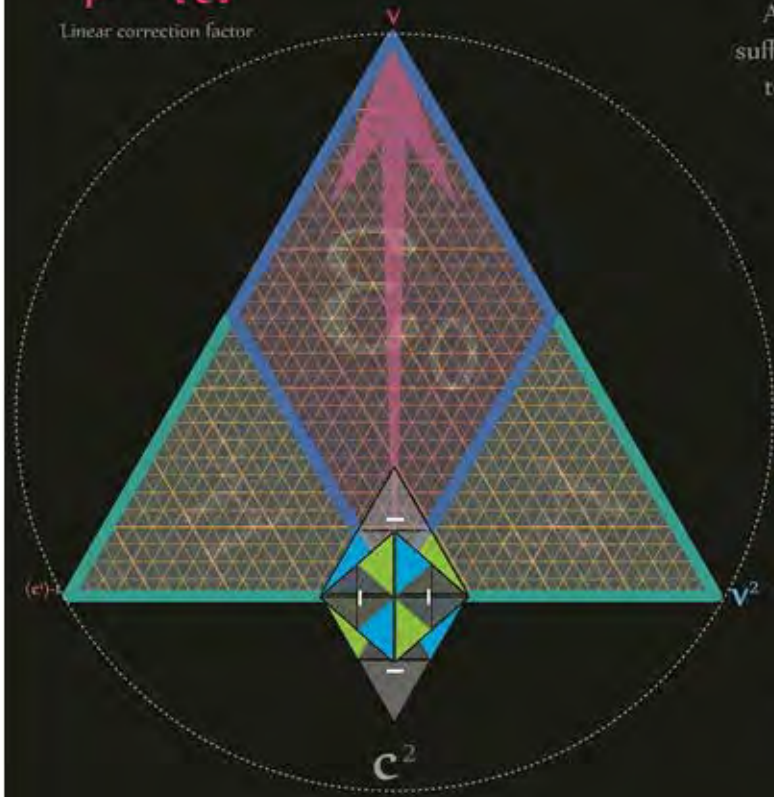
Superluminal velocities

REQUIRED VELOCITY

$\beta = \left[\frac{v}{c}\right]$

Linear correction factor



Any velocity is obtainable by Matter providing sufficient energy is released in very short durations to a region of space containing a charged body

$$\Sigma F = \frac{\Delta p}{dt} = m.\frac{dv}{dt}$$

W bosons $[h\nu]-$ decelerate

E

W bosons $+[h\nu]$ accelerate

Every quantum energy level change requires a related change in the number of quanta compared to the previous energy level (ad infinitum)

Note: Inertial considerations still apply
Instanteous release of energy to acheive superluminal velocities is not advised

The speed of light is a limiting velocity for accelerations due to transverse wave electromagnetic energies

Providing the KEM geometry contains enough energy per c^2 geometry the long held belief of 'the speed of light' being an ultimate speed barrier is shown to be invalid

KEM fields contain energy-momenta

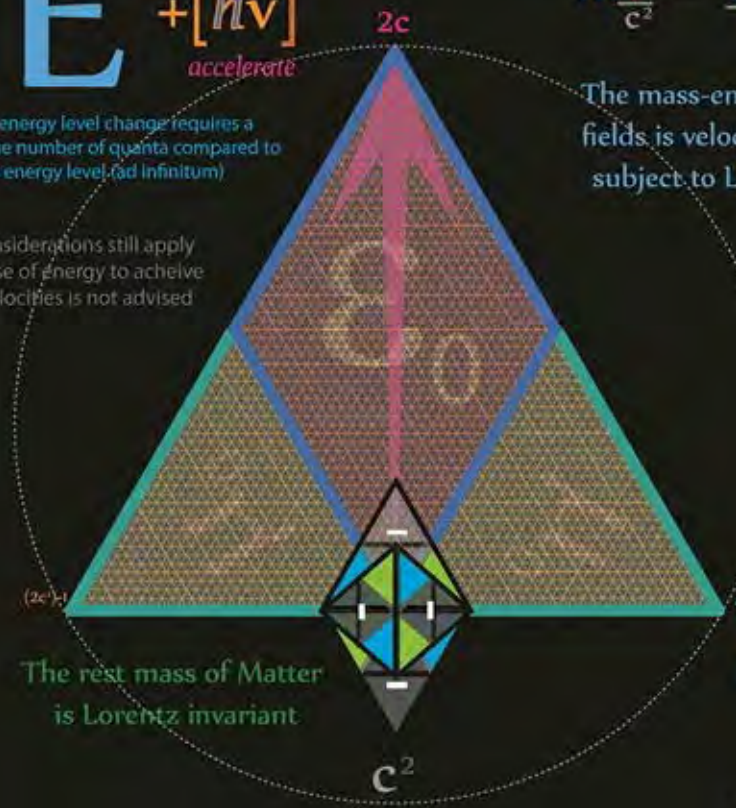
$p^2 = KEM = mv^2$

Any mass-energy field moving at superluminal velocities is still subject to Lorentz contractions

Any Matter held within, and moving along with, a superluminal EM field remains Lorentz invariant

$$\frac{mv^2}{c^2} = \frac{KEM}{c^2} = \frac{h\nu^2}{c^2}$$

The mass-energy of Kinetic EM fields is velocity dependent and subject to Lorentz corrections



The rest mass of Matter is Lorentz invariant

ENERGY REQUIRED

$\beta^2 = \left[\frac{v^2}{c^2}\right]$

Scalar correction factor

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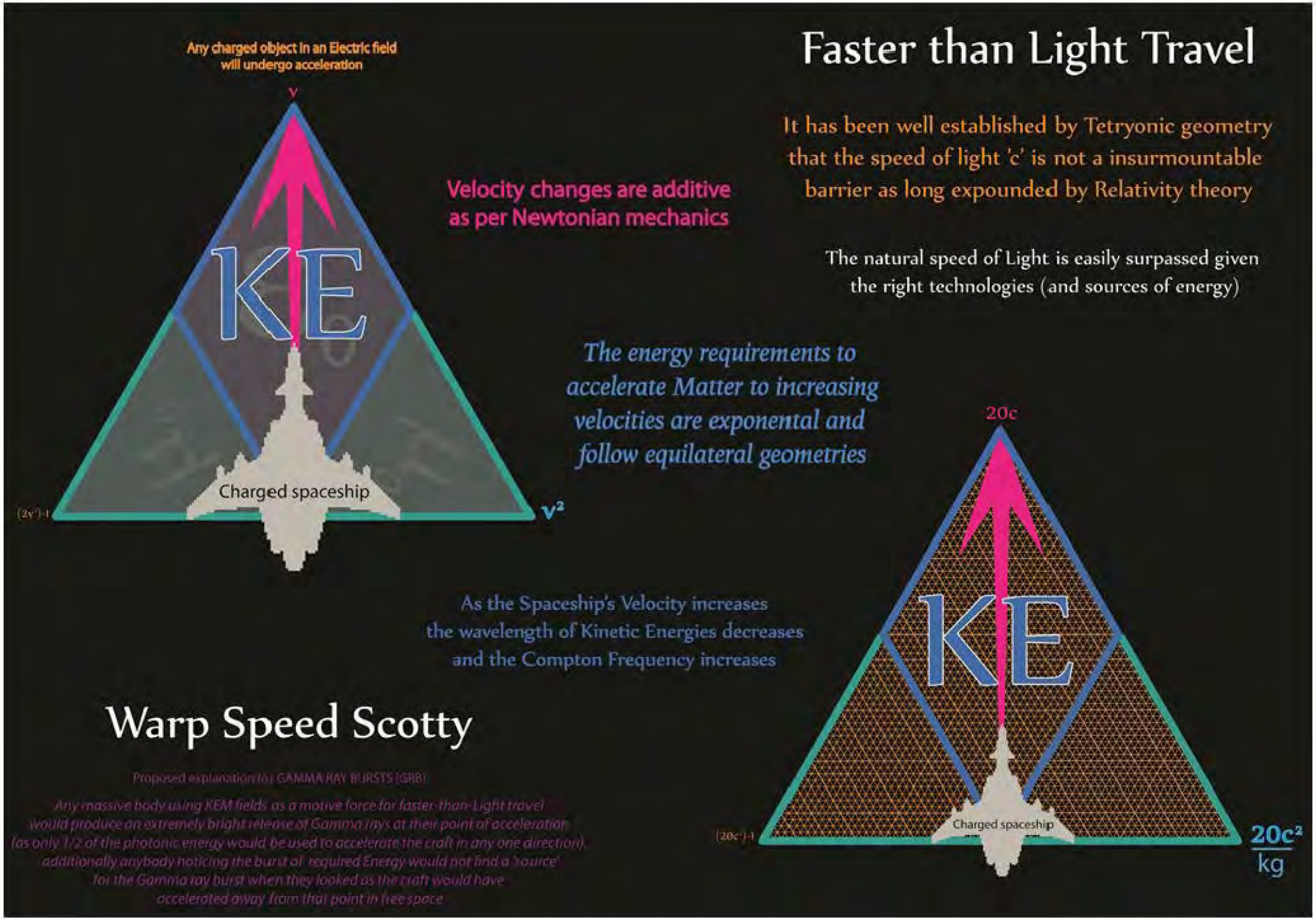
Faster than Light Travel


Any charged object in an Electric field will undergo acceleration
v
KE
Charged spaceship
(2v²)-1
v²
Velocity changes are additive as per Newtonian mechanics
It has been well established by Tetryonic geometry that the speed of light 'c' is not a insurmountable barrier as long expounded by Relativity theory
The natural speed of Light is easily surpassed given the right technologies (and sources of energy)
The energy requirements to accelerate Matter to increasing velocities are exponental and follow equilateral geometries
20c
KE
Charged spaceship
(20c²)-1
20c²/kg
As the Spaceship's Velocity increases the wavelength of Kinetic Energies decreases and the Compton Frequency increases
Warp Speed Scotty
Proposed explanation for GAMMA RAY BURSTS (GRB)
Any massive body using KEM fields as a motive force for faster-than-Light travel would produce an extremely bright release of Gamma rays at their point of acceleration (as only 1/2 of the photonic energy would be used to accelerate the craft in any one direction). additionally anybody noticing the burst of required Energy would not find a 'source' for the Gamma ray burst when they looked as the craft would have accelerated away from that point in free space

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Conservation symmetry

A conservation law states that some quantity X
(describing any physical system)
remains constant throughout its motion

$$\frac{\Delta x}{dt} = 0$$

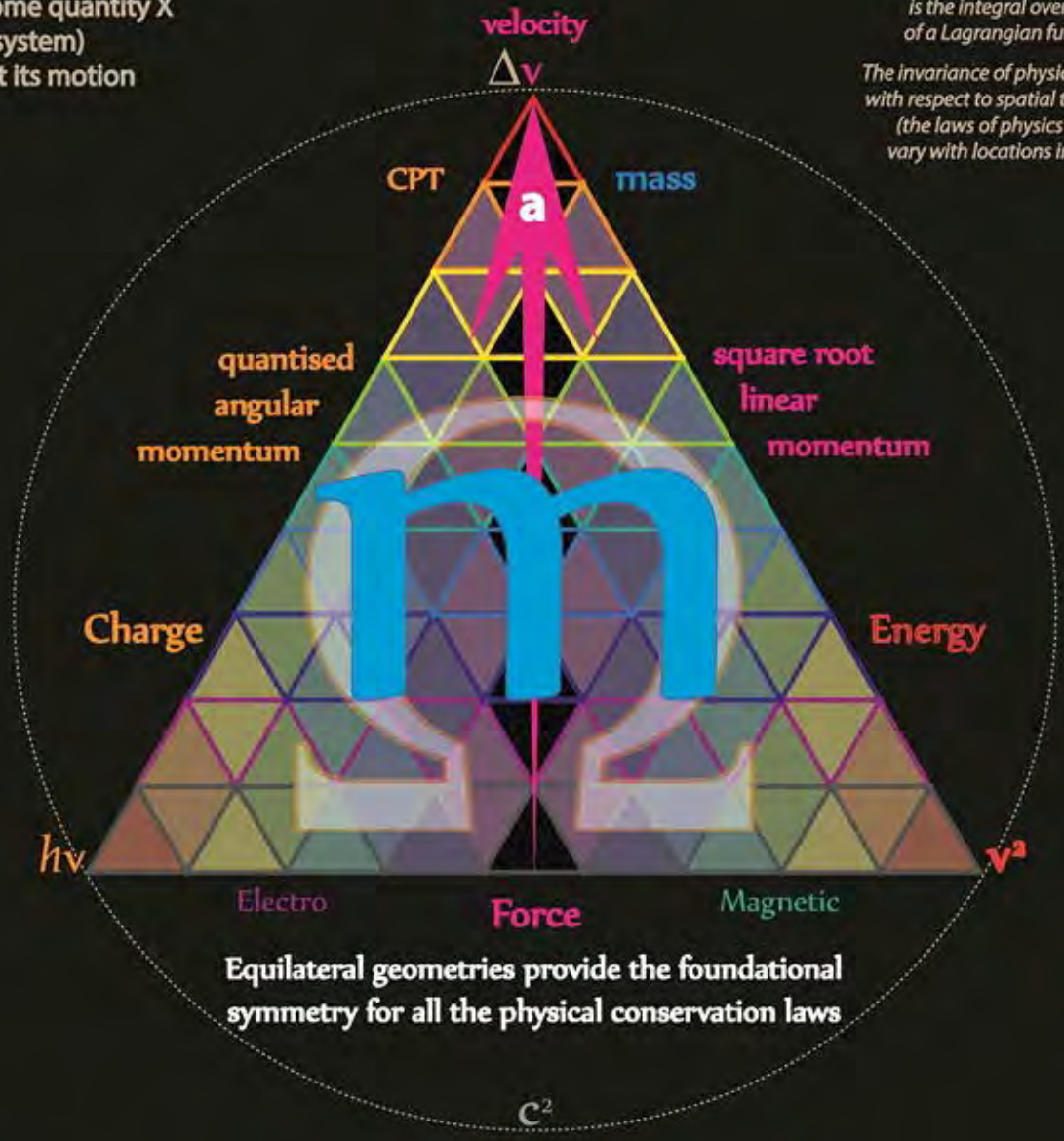
Rotation symmetry gives
conservation of angular momentum

conservation of angular momenta

$$\left[\frac{\Omega}{c^2}\right]$$

QAM / second

conservation of linear momentum



Equilateral geometries provide the foundational symmetry for all the physical conservation laws

Matter topologies are not conservative

Noether's Symmetry

The action of a physical system is the integral over time of a Lagrangian function

The invariance of physical systems with respect to spatial translation (the laws of physics do not vary with locations in space)

Amalie Emmy Noether

(23 March 1882 – 14 April 1935)

Time translation symmetry
gives conservation of energy

conservation of energy

$$\left[m\Omega v^2\right]$$

6.629432672 e-34 J

Planck quanta

mass velocity

7.376238634 e-51 kg

mass-ENERGY quanta

conservation of mass

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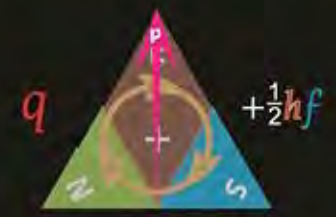
Virtual Particles

In physics, a virtual particle is a particle that exists for a limited time and space.
The energy and momentum of a virtual particle are uncertain according to the uncertainty principle.
The degree of uncertainty of each is inversely proportional to
time duration (for energy) or to position span (for momentum).

In Tetryonics the Uncertainity principle
has been negated with deterministic, re-normalisable
charged mass-ENERGY geometries & Matter topologies



Positive Zero Point Field
energy momenta

Longitudinal waves facilitate
action-at-a-distance

Convergent Gravitation
is attractive

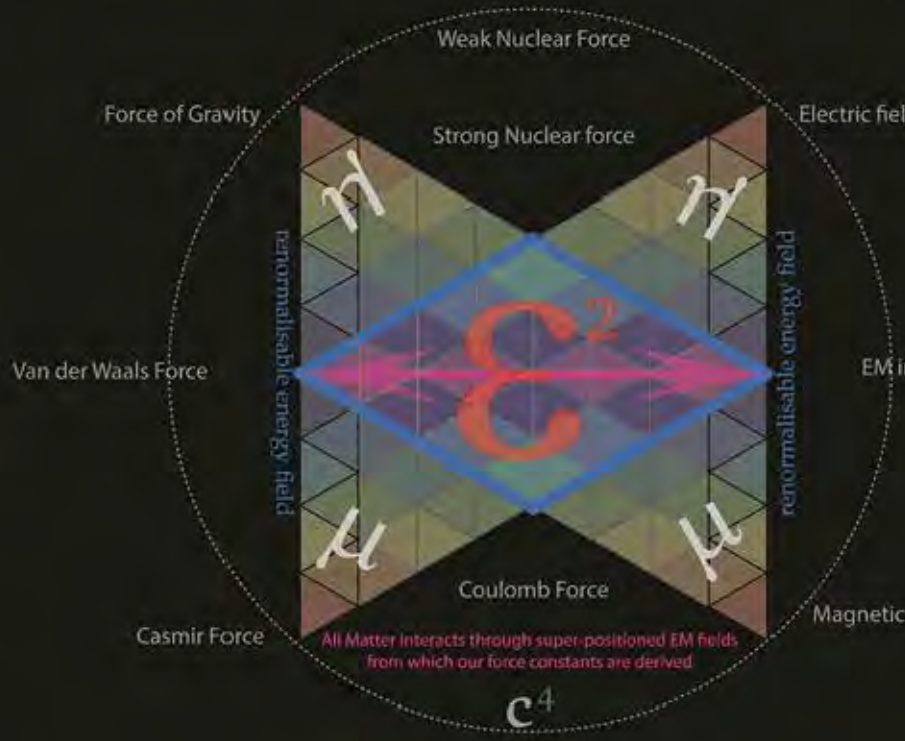
Material Gravitation

Negative Zero Point Field
energy momenta

Energy propagates at the
speed of light

Divergent Coulomb forces
are interactive

EM Interactions



Vacuum field Energies

$$m^2c^4 = E^2 = p^2c^2$$

EM mass

momenta

M

Charged Matter topologies
in vacuum energy fields
create Gravity

m

Superpositioned EM fields
create interactive
EM forces

virtual Particles are not a required part of tetryonic theory

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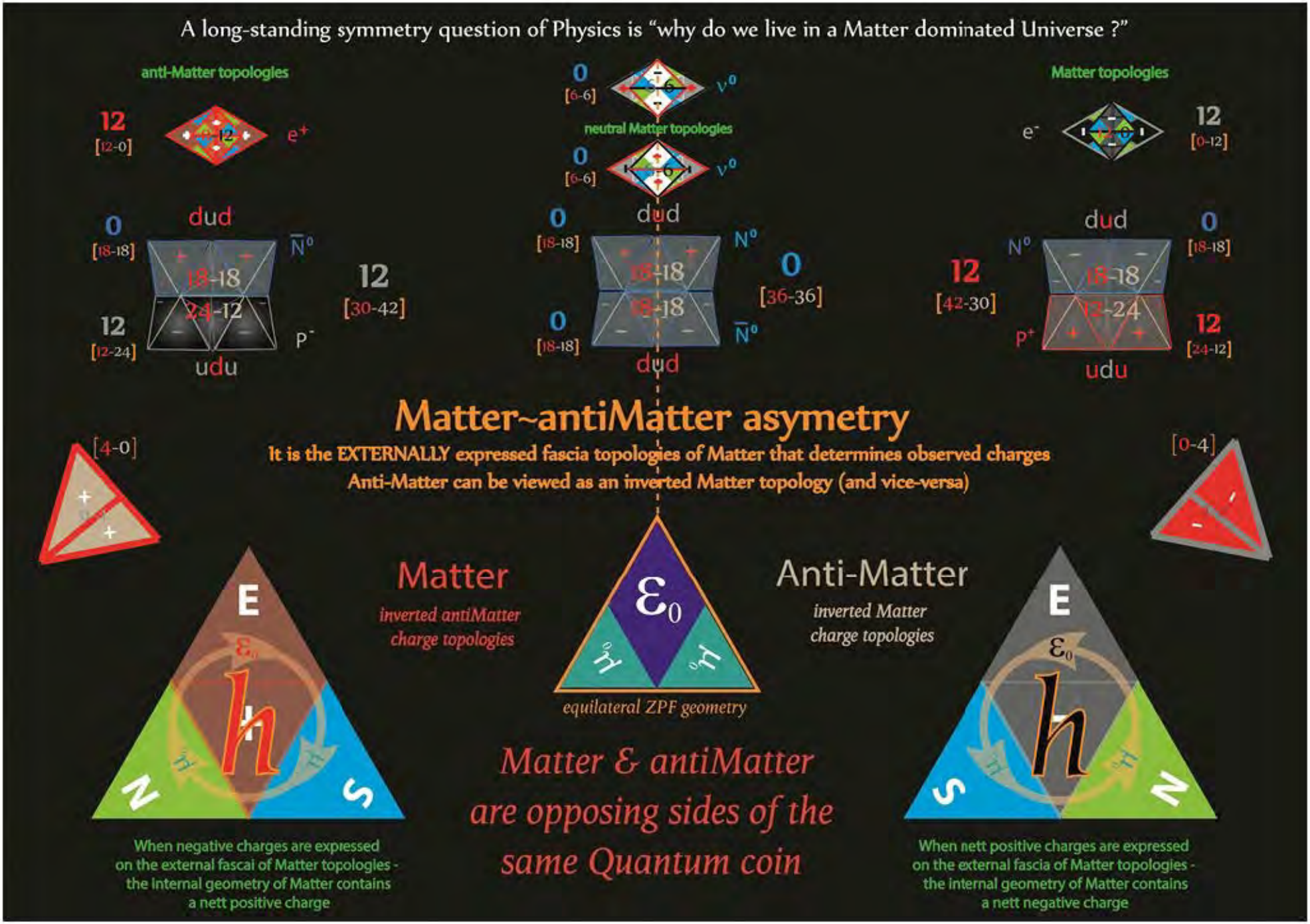

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Types of Matter

Anti-Matter

anti-Neutron
positron
anti-Proton

0
[24-24]

udu
anti-Hydrogen

dud

0
[42-42]

anti-Deuterium

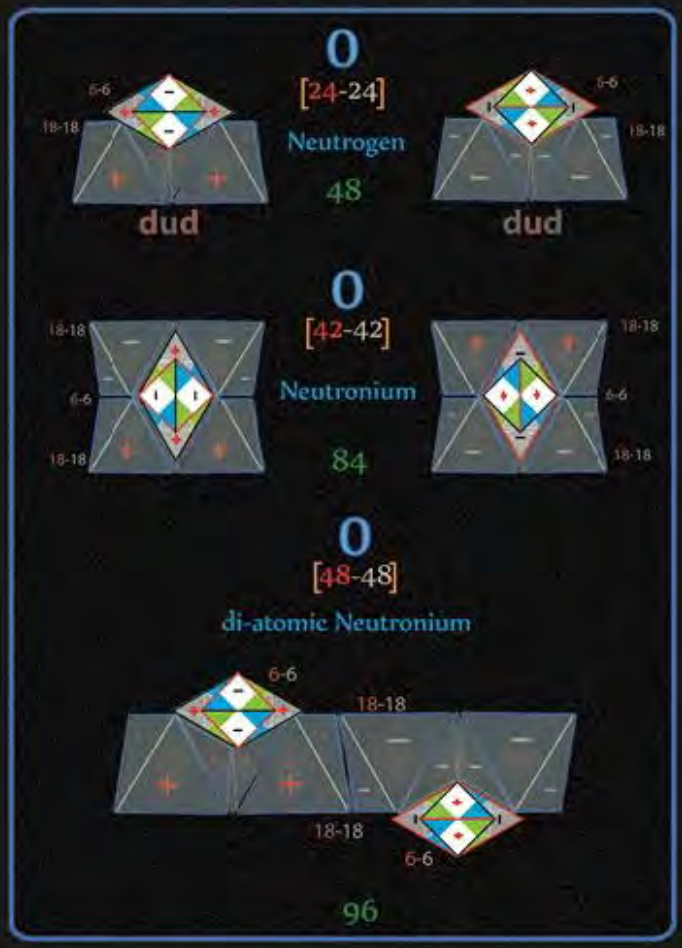
0
[48-48]

di-atomic
anti-Hydrogen

In addition to the established Matter-antiMatter forms of mass
there exists a third form of Matter

Neutral Matter

Neutron Neutrino anti-Neutron



The Universe is filled with Matter - Neutronium - antiMatter star Galaxies
and their emitted photons of light are identical

Matter

Neutron
electron
Proton

udu
Hydrogen

dud

Deuterium

di-atomic
Hydrogen

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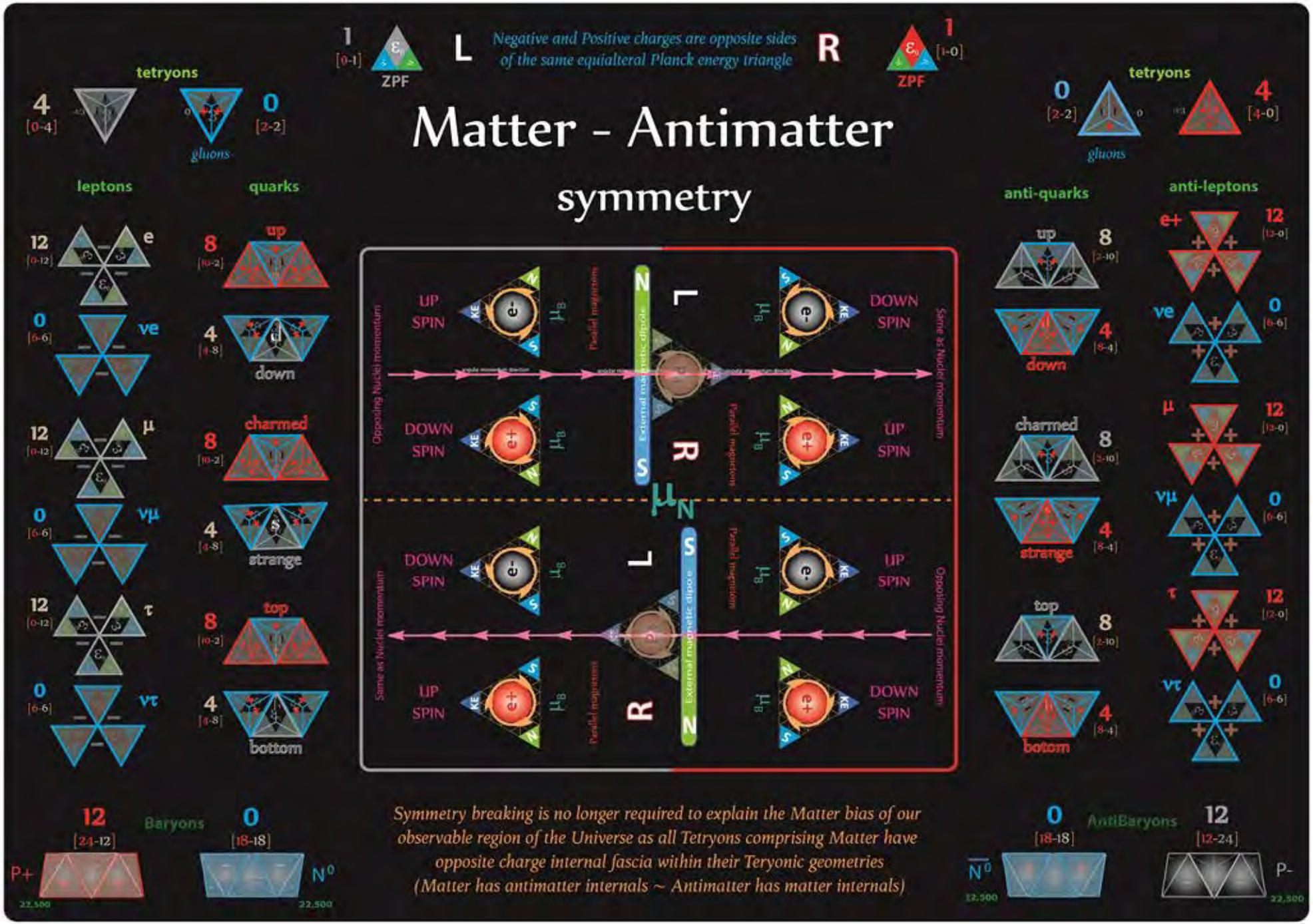

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Anti-Matter

Baryon asymmetry

Matter

The Big Bang should have produced equal amounts of Matter and antiMatter, as such, there should have been total cancellation of both.

It is not yet understood why the Universe has more matter than antimatter.
It is generally assumed that when the Universe was young and very hot,
it was in equilibrium and contained equal numbers of baryons and antibaryons.

Protons should have cancelled with antiprotons, electrons with antielectrons (positrons),
neutrons with antineutrons, and so on for all elementary particles.
This would have resulted in a sea of photons in the universe with no matter.

However, observations suggest that the Universe, including its most distant parts,
is made almost entirely of normal matter.

dud

anti-Deuterium

0
[42-42]
84

anti-Neutron
positron
anti-Proton

0
[42-42]
Neutronium
84

Neutron
electron
Proton

dud

0
[42-42]
84

Deuterium

antiMatter dominated Galaxy

Clockwise rotation

Neutral Matter

Neutron Neutrino anti-Neutron

Tetryonics dictates that the Universe is filled with Matter - Neutronium - Antimatter star Galaxies and their emitted light photons are identical

Tetryonics also demonstrates that the charge topologies of each Matter type prevalent in the formation of each Galaxy determines the overall resultant EM field geometries that shapes their large-scale evolution

It is hypothesised that the rotation direction of galaxies is also influenced by how each galaxy was formed in particular the predominance of Matter over antiMatter interactions and the electrodynamic fields of each Galaxy's GEM pinch core

Matter dominated Galaxy

Counter-clockwise rotation

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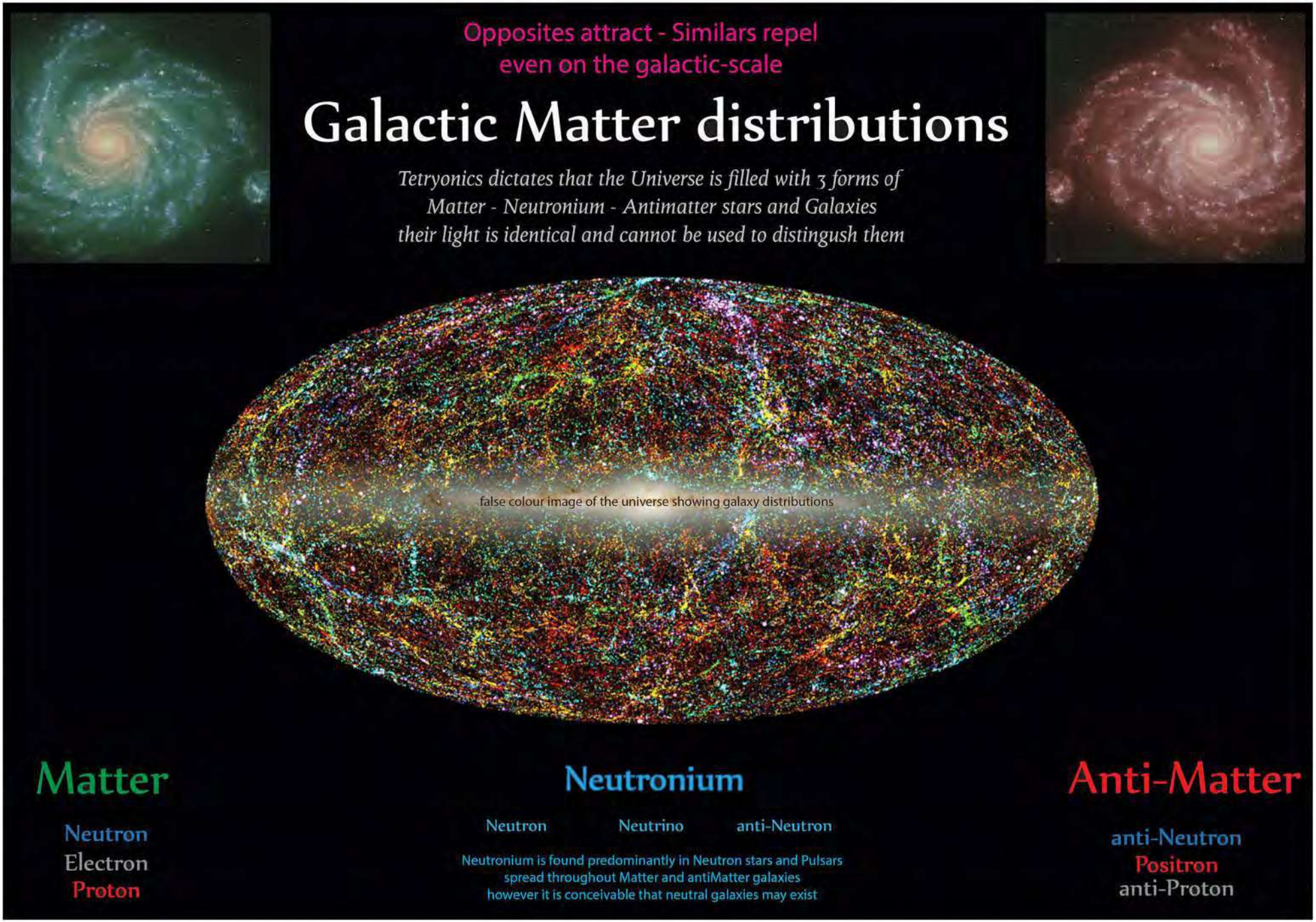
Opposites attract - Similars repel
even on the galactic-scale
Galactic Matter distributions
Tetryonics dictates that the Universe is filled with 3 forms of
Matter - Neutronium - Antimatter stars and Galaxies
their light is identical and cannot be used to distingush them
false colour image of the universe showing galaxy distributions
Matter
Neutron
Electron
Proton
Neutronium
Neutron
Neutrino
anti-Neutron
Neutronium is found predominantly in Neutron stars and Pulsars
spread throughout Matter and antiMatter galaxies
however it is conceivable that neutral galaxies may exist
Anti-Matter
anti-Neutron
Positron
anti-Proton

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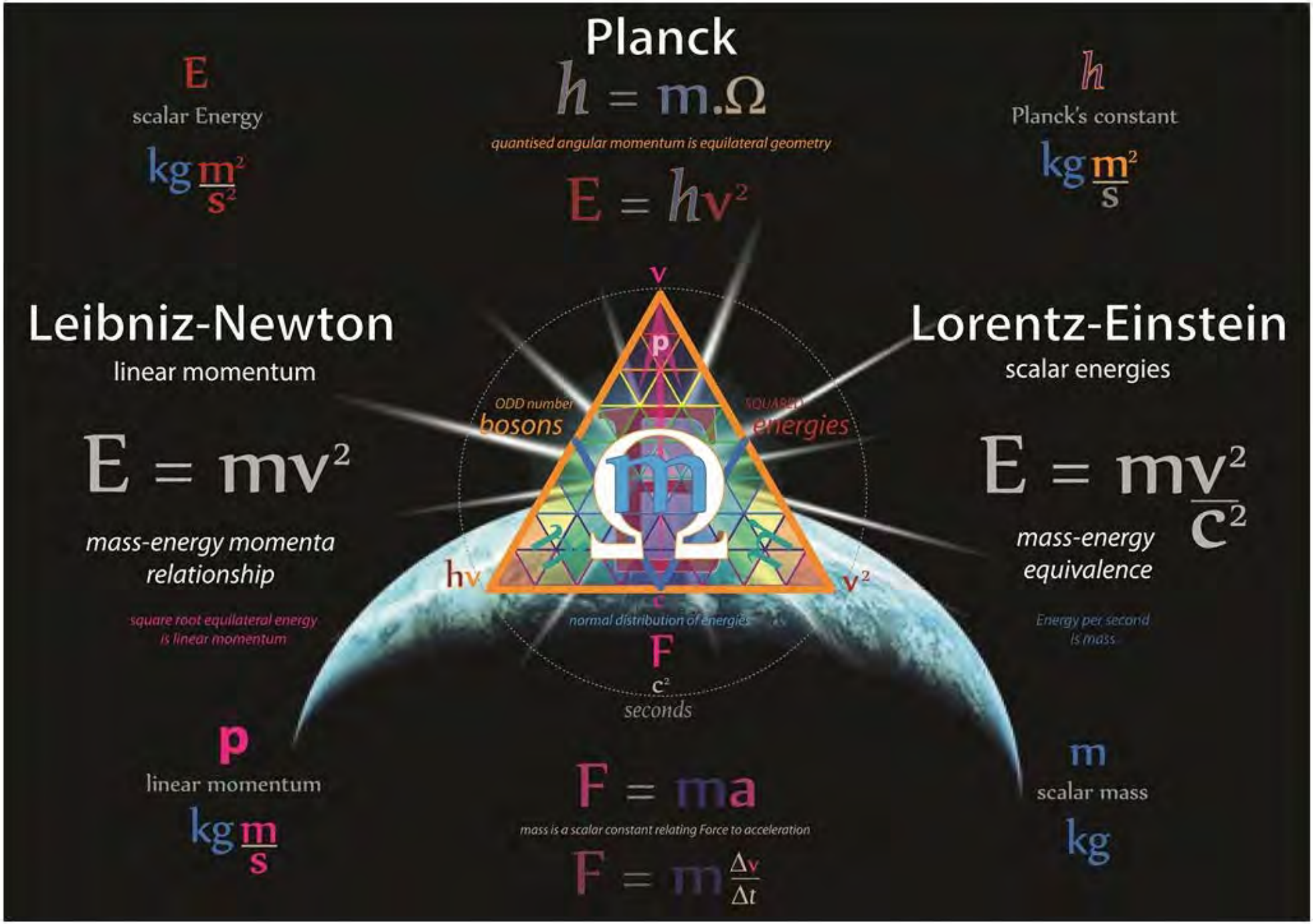

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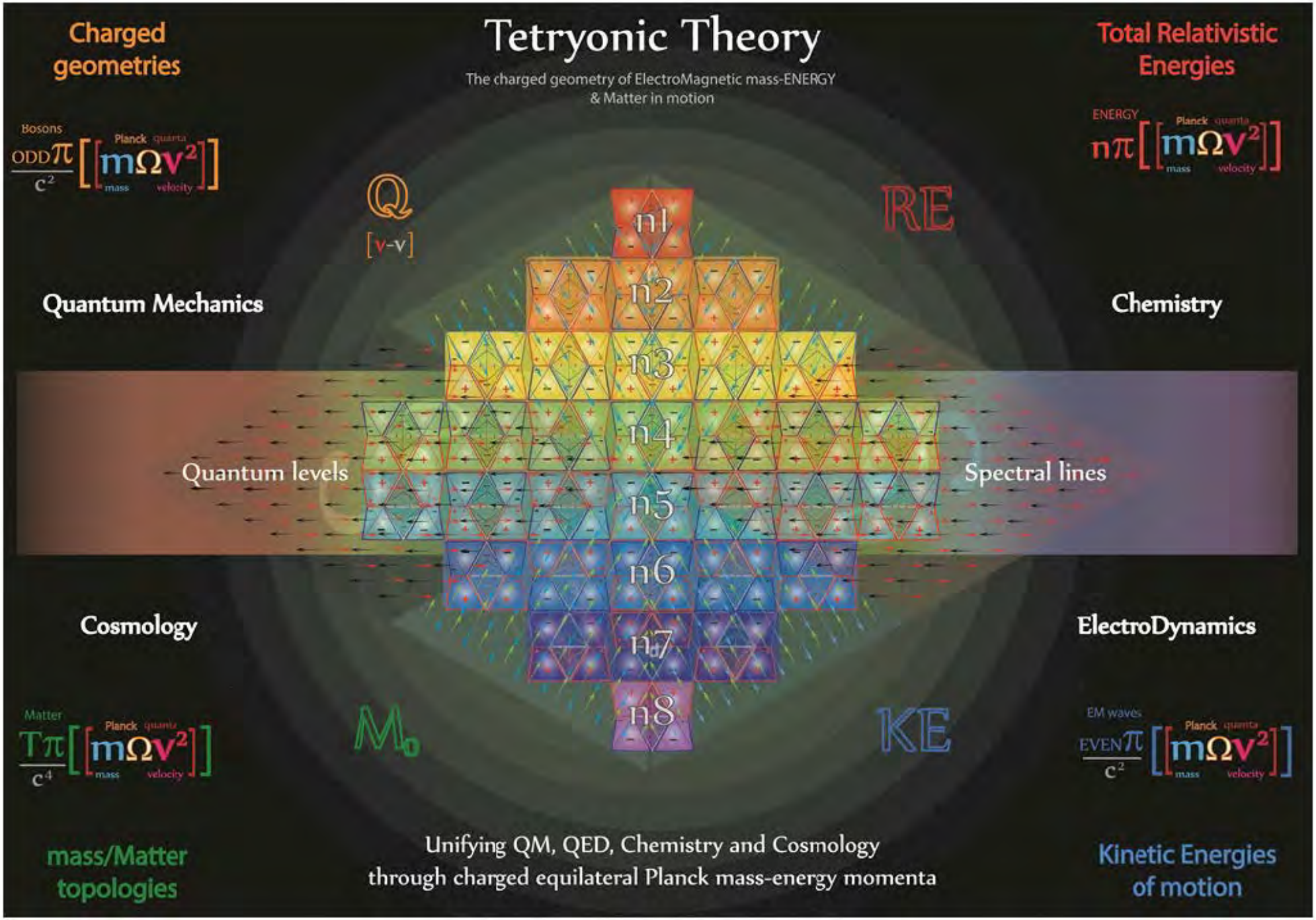

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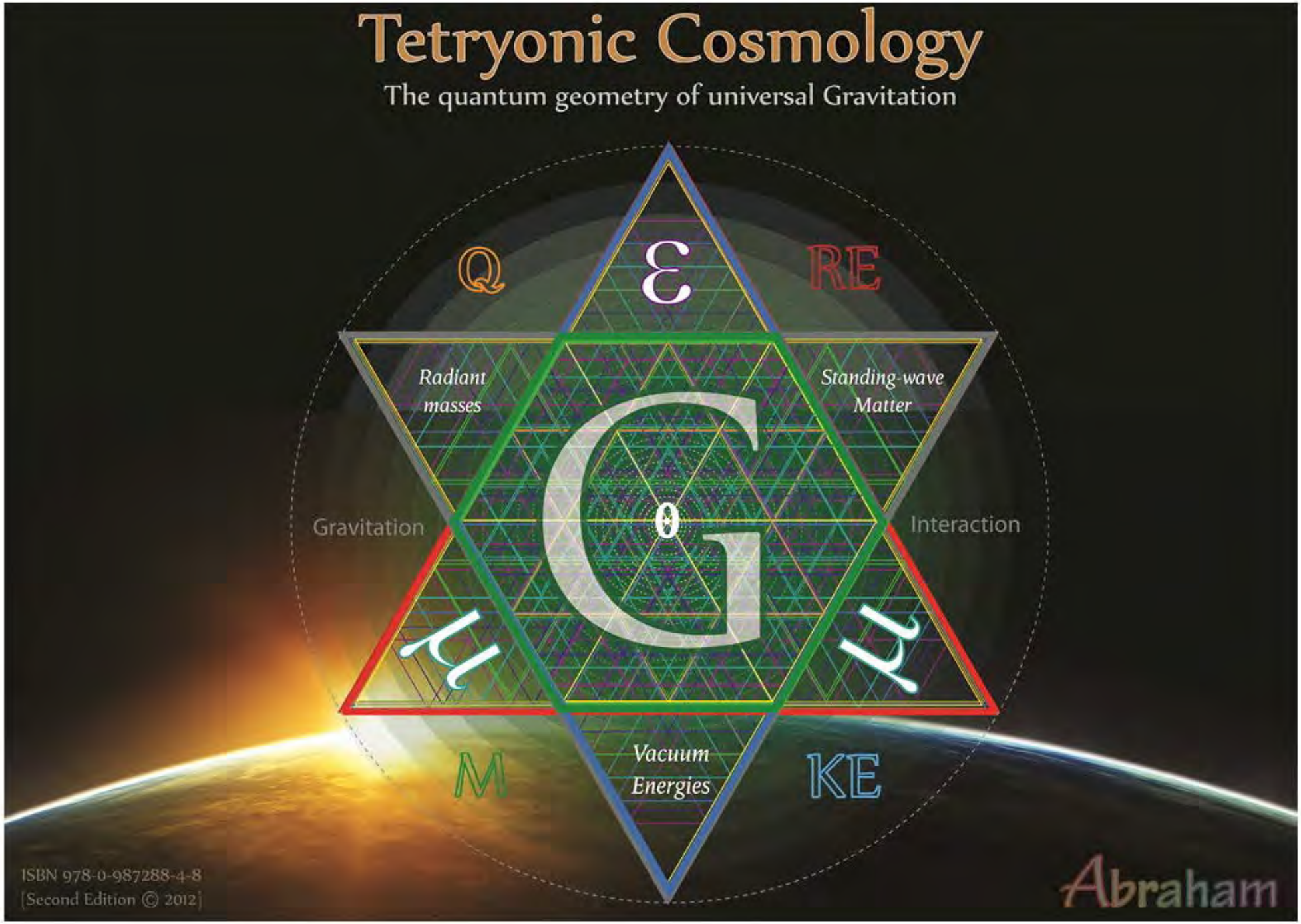

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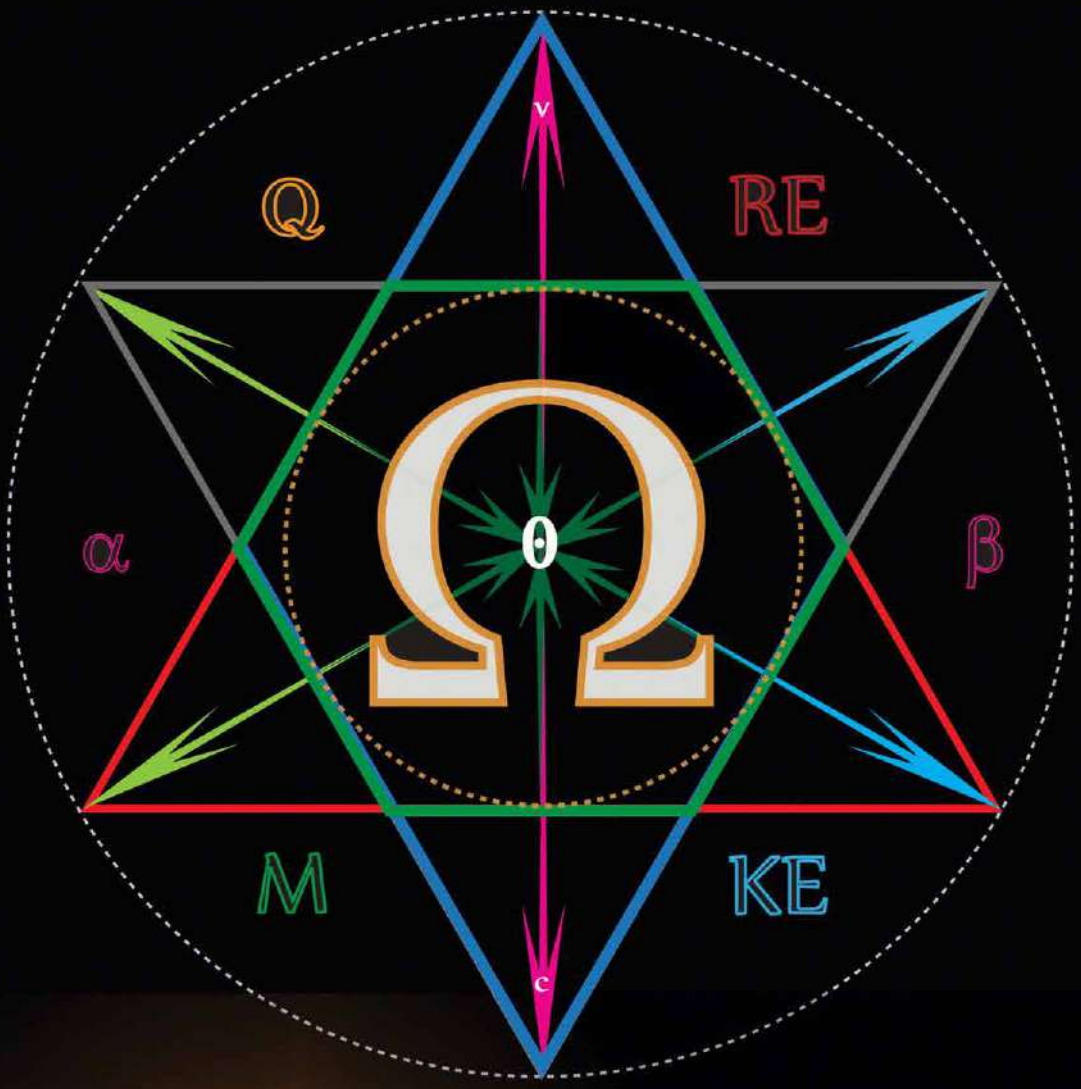
TETRYONICS

The equilateral geometry underpinning the mathematics of Physics



Foundational physics Mathematics

Abraham

ISBN 978-0-987288-5-5

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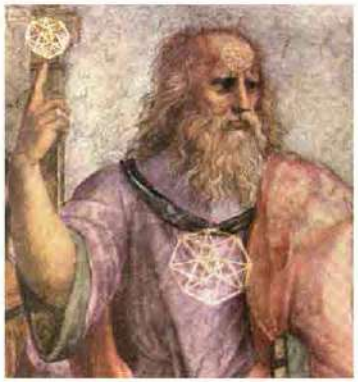
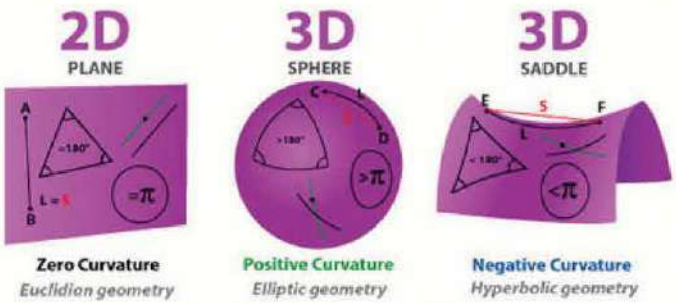
Geometry and the Theory of Everything

Plato



(c.428-348 BC)

DIFFERENT TYPE OF GEOMETRIES



(studied by Omar Khayyam, Girolamo Saccheri, Bernhard Riemann, ...)

Euclid

(c.330-275 BC, fl. c.300 BC)

The Socratic tradition was not particularly congenial to mathematics, as may be gathered from Socrates' inability to convince himself that 1 plus 1 equals 2, but it seems that his student Plato gained an appreciation for mathematics after a series of conversations with his friend Archytas in 388 BC.

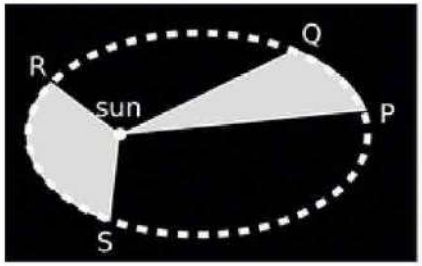
One of the things that most caught Plato's imagination was the existence and uniqueness of what are now called the five "Platonic solids".

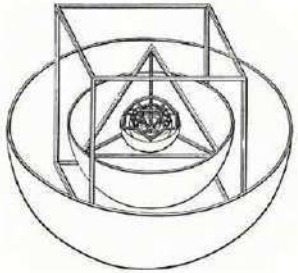
It's uncertain who first described all five of these shapes - it may have been the early Pythagoreans - but some sources (including Euclid) indicate that Theaetetus (another friend of Plato's) wrote the first complete account of the five regular solids.

Presumably this formed the basis of the constructions of the Platonic solids that constitute the concluding Book XIII of Euclid's Elements.

In any case, Plato was mightily impressed by these five definite shapes that constitute the only perfectly symmetrical arrangements of a set of (non-planar) points in space, and late in life he expounded a complete "theory of everything", in the treatise called Timaeus, based explicitly on these five solids.

Interestingly, almost 2000 years later, Johannes Kepler was similarly fascinated by these five shapes, and developed his own cosmology from them





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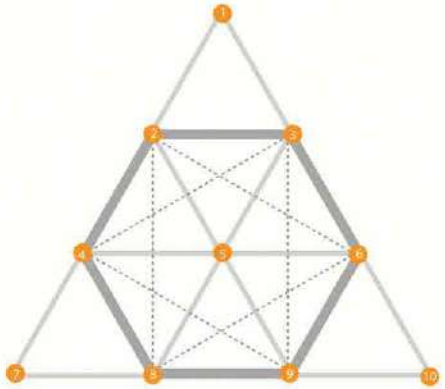
Tetractys

The Greek Tetractys is a triangular figure consisting of ten points arranged in four rows:

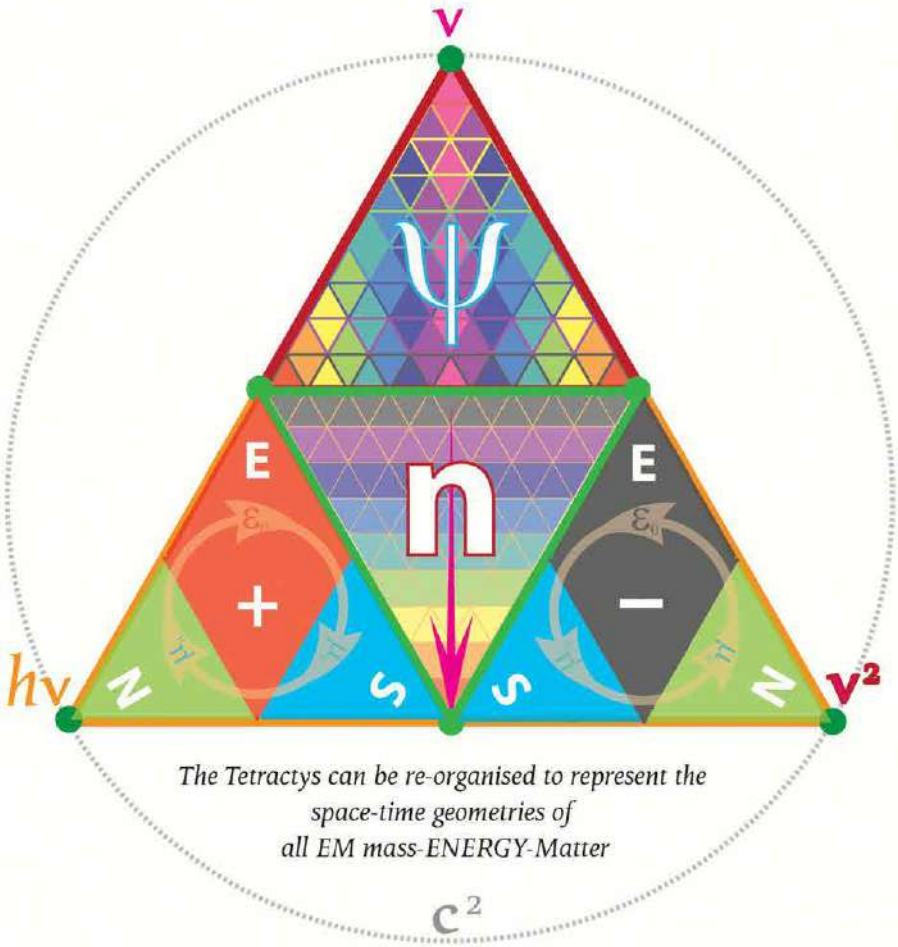
one, two, three, and four points in each row, which is the geometrical representation of the fourth triangular number.

As a mystical symbol, it was very important to the secret worship of the Pythagoreans.



Sacred numbers

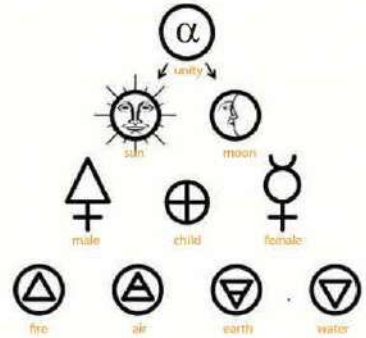
The Tetractys historically symbolized the four elements [Earth, Air, Fire, and Water] and the relationship between Humanity and the cosmos created by GOD



The Tetractys can be re-organised to represent the space-time geometries of all EM mass-ENERGY-Matter

The tetrad was the name given to the number four - in Pythagorean philosophy there were four seasons and four elements, and the number was also associated with planetary motions and music

As a mystical symbol, it was very important to the secret worship of the Pythagoreans.



The Cosmos

The single triangle in the first row represents zero-dimensions (a point)
A vector direction in one-dimension can be represented as a line between any two points
The second row represents a Boson (two-dimensions in a plane defined by a rhombus of three triangles)
The whole figure folded represents three-dimensions (a tetrahedron defined by four apex points)
Photons of ElectroMagnetic mass-Energy quanta are represented by two opposing triangles

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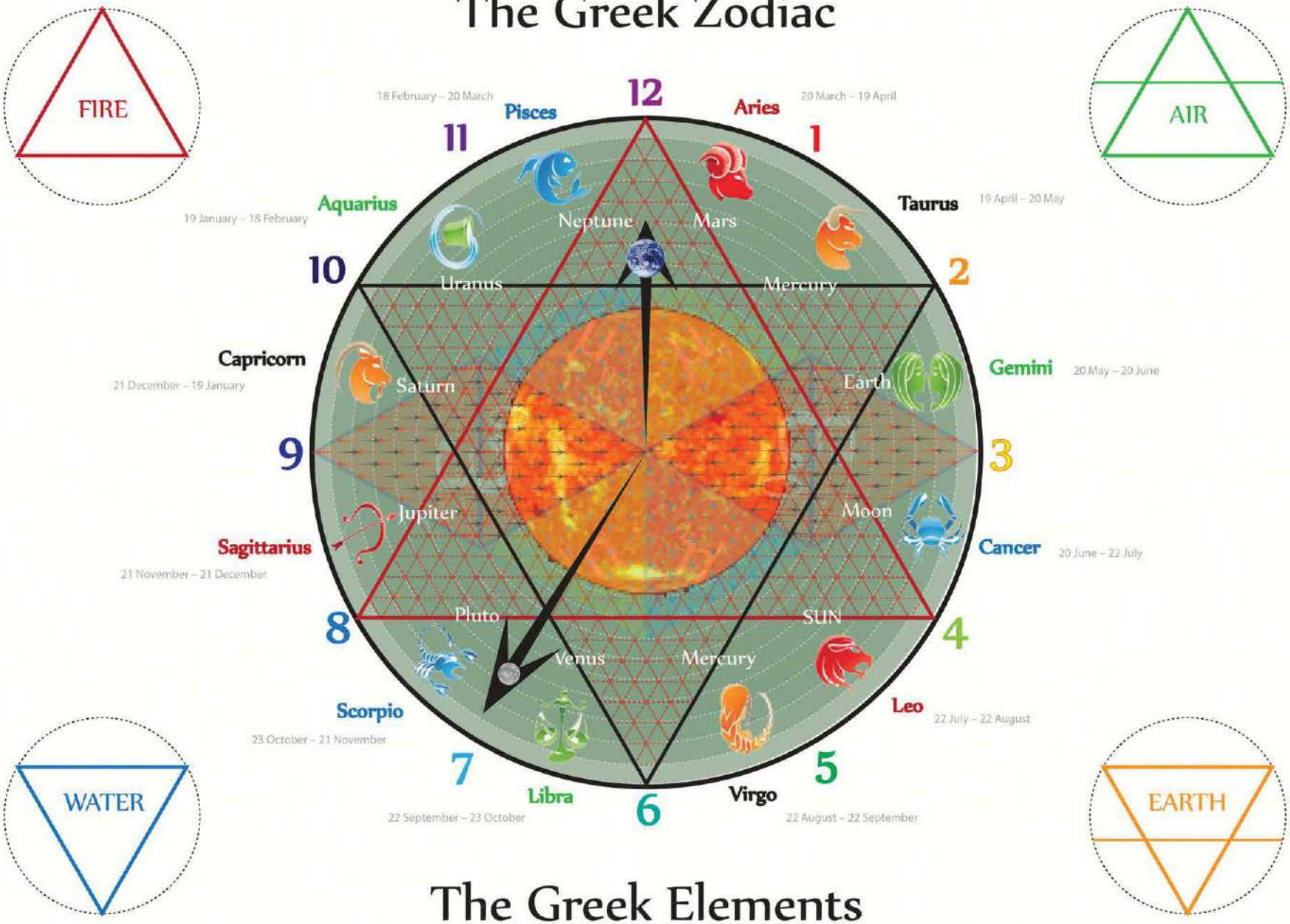
The Greek Zodiac



The Greek Elements

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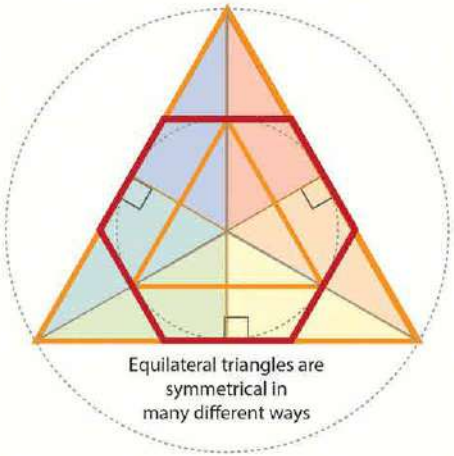
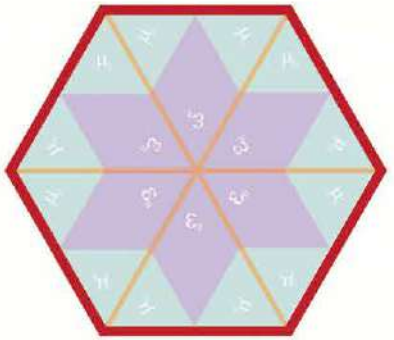
Equilateral Triangles

An equilateral triangle is a triangle in which all three sides are equal



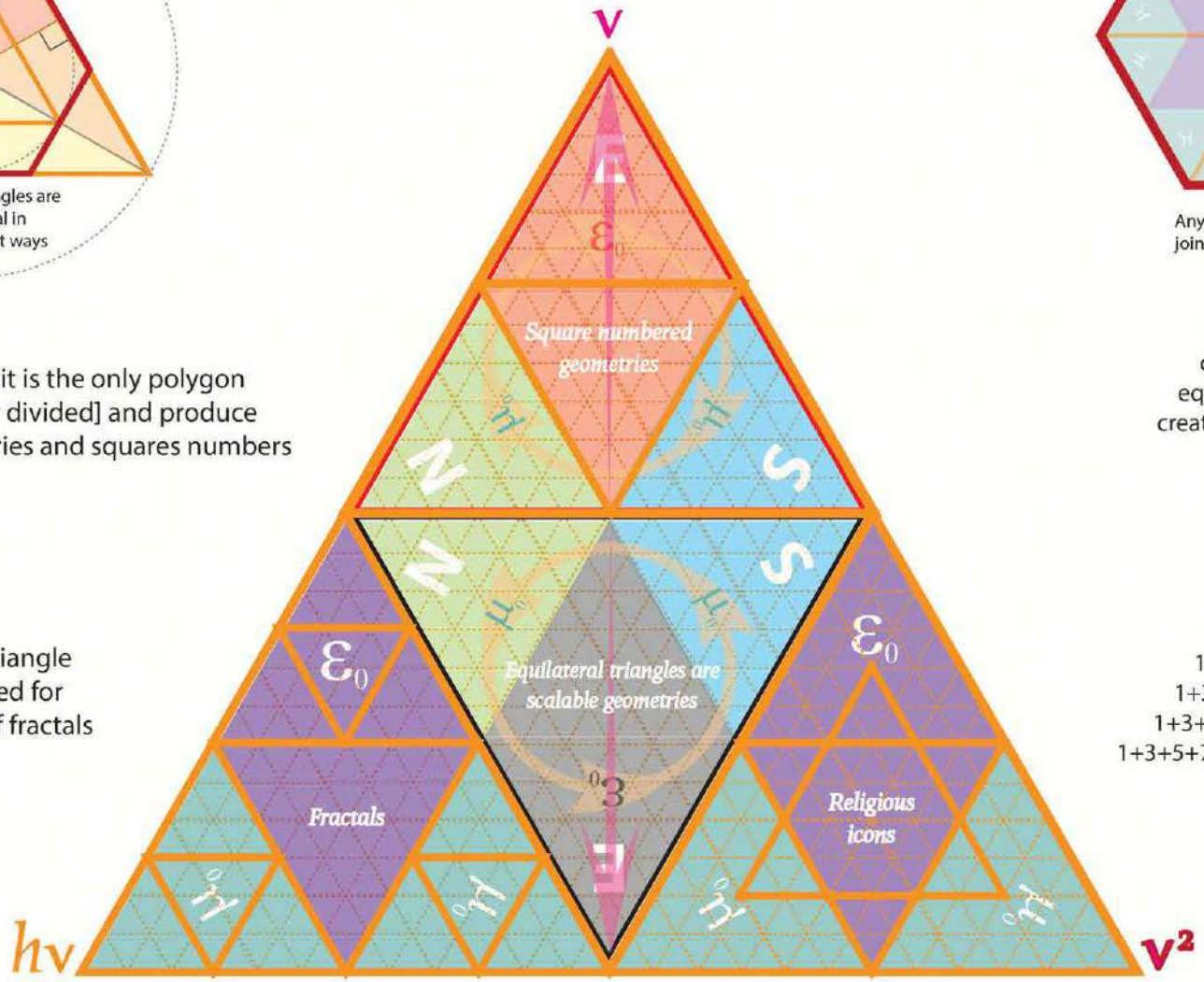
Equilateral triangles are symmetrical in many different ways



Any six equilateral triangles joined can make a hexagon.

It is unique in that it is the only polygon that can be tiled [or divided] and produce only identical geometries and squares numbers

The equilateral triangle is eminently suited for the construction of fractals



The tesselation of odd numbered equilateral triangles creates square numbers

That is,

1
1+3 = 4
1+3+5 = 9
1+3+5+7 = 16
1+3+5+7+9 = 25
1+3+5+7+9+11 = 36
1+3+5+7+9+11+13 = 49
1+3+5+7+7+9+11+13+15 = 64
etc

An equilateral triangle is simply a specific case of a regular polygon with 3 sides

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The Pythagorean Theorem

Though attributed to Pythagoras, it is not certain that he was the first person to prove it.

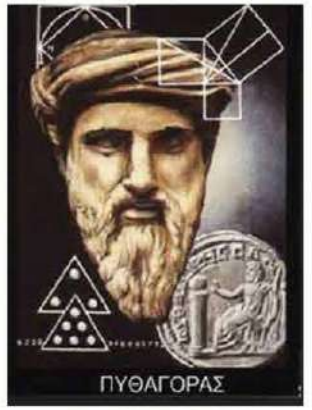
The first clear proof came from Euclid, and it is possible the concept was known 1000 years before Pythoragas by the Babylonians

$$a^2 + b^2 = c^2$$

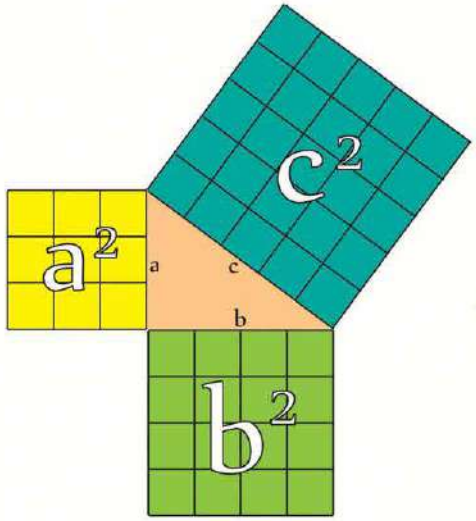
The square of the hypotenuse of a triangle is equal to the sum of the squares of its sides.

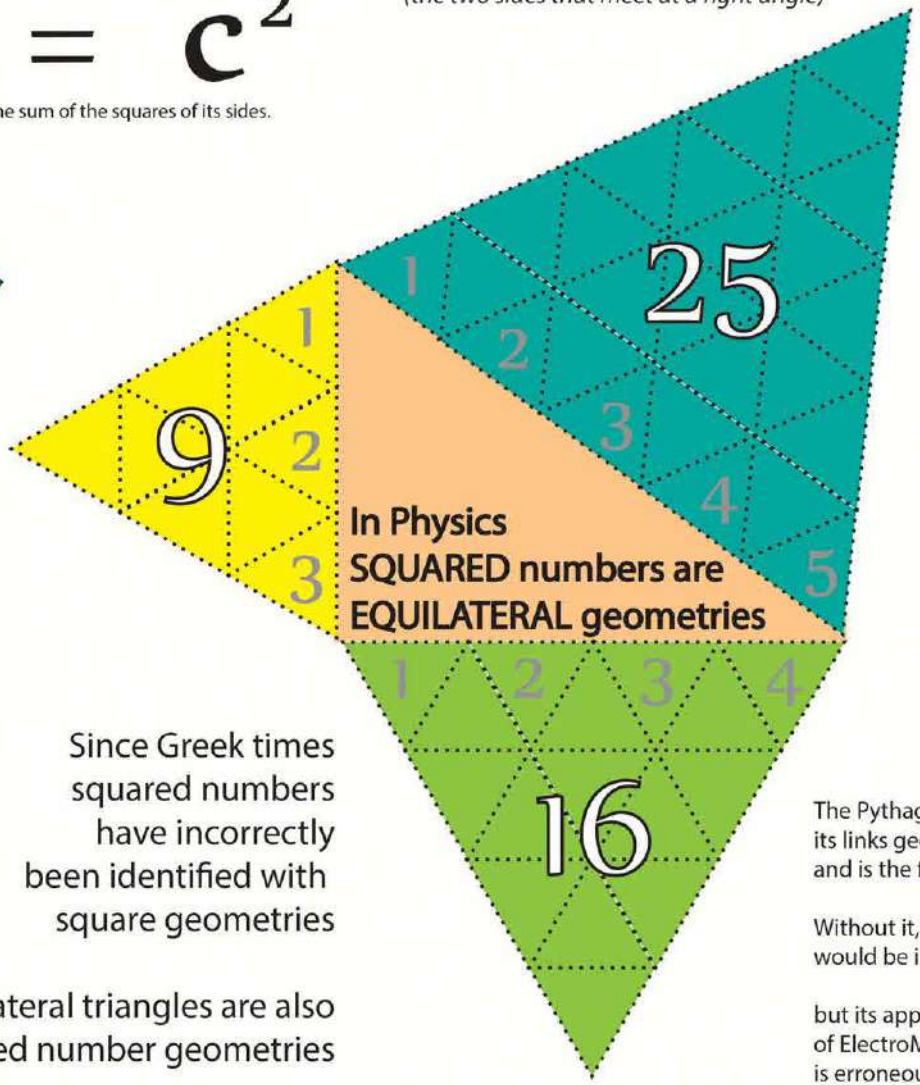
In any right triangle,
the area of the square whose side is the hypotenuse
(the side opposite the right angle) is equal to
the sum of the areas of the squares
whose sides are the two legs
(the two sides that meet at a right angle)

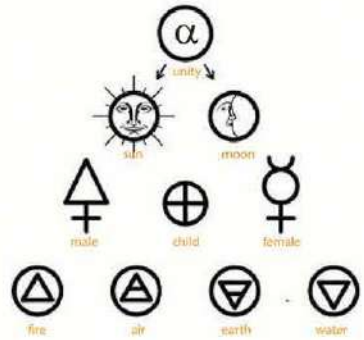
Pythagoras of Samos



about (570 – 495 BC)







Pythagorean Tetractys

Since Greek times
squared numbers
have incorrectly
been identified with
square geometries

Equilateral triangles are also
squared number geometries

The Pythagorean equation is at the core of much of geometry,
its links geometry with algebra,
and is the foundation of trigonometry.

Without it, accurate surveying, mapmaking, and navigation
would be impossible,

but its application to the energy-momenta geometries
of ElectroMagnetic fields and Matter in motion in Physics
is erroneous and must be corrected for science to advance

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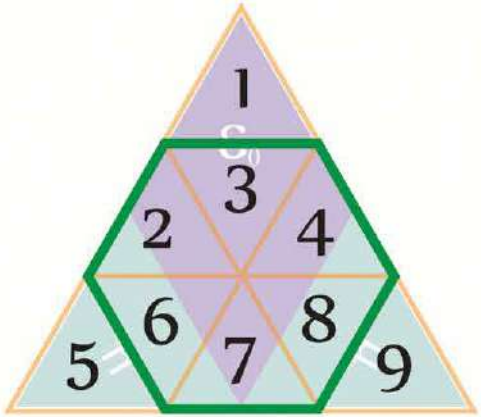
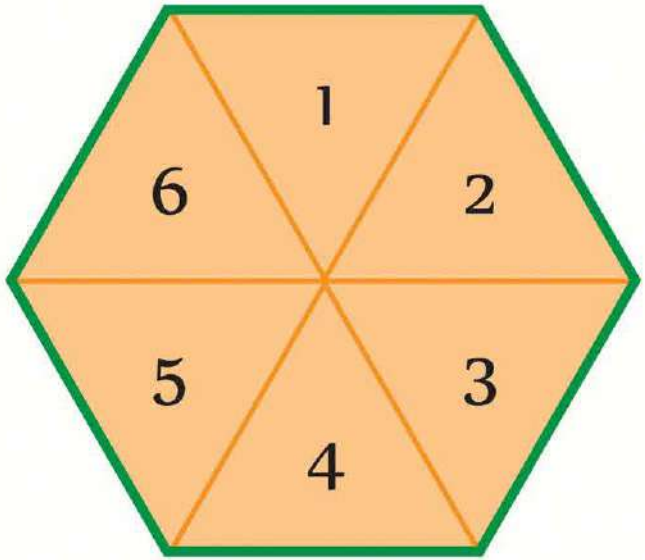
Hexagons



Energy geometries

A regular hexagon can be subdivided into six equilateral triangles

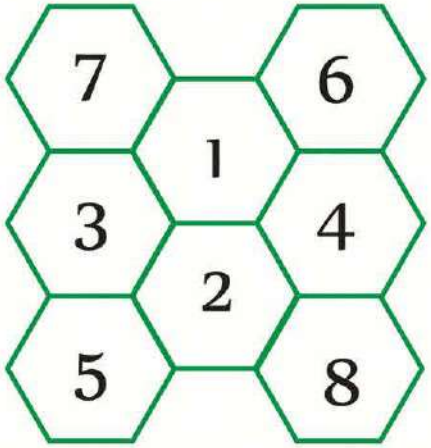
Hexagons are the only regular polygon that can be subdivided into another regular polygon



Hexagons are the unique regular polygon such that the distance between the center and each vertex is equal to the length of each side

An interesting relationship between circular and hexagonal geometry is that hexagonal patterns often appear spontaneously when natural forces are trying to approximate circles

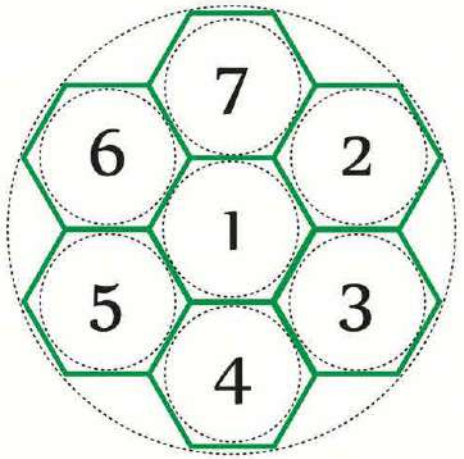
Atomic nuclei geometries



Hexagons can be tiled or tessellated in a regular pattern on a flat two-dimensional plane

Six is a highly composite number, the second-smallest composite number, and the first perfect number.

That is, 1*2*3=1+2+3=6



Hexagonal tessellation is topologically identical to the close packing of circles on a plane

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Platonic Solids

The Pythagoreans knew that there were only five regular convex solids, the tetrahedon, cube, octahedron, icosohedron and dodecahedron and each one could be accurately circumscribed by a sphere.

FIRE

4 triangles meet to form a Tetrahedron

EARTH

6 squares meet to form a Cube

AIR

8 triangles meet to form a Octahedron

tetryons 4

regular deltahedrons

leptons 12

8 quarks

regular deltahedrons

20 Baryons

$$F - E + V = 2$$

faces edges vertexs

Plato

(c.428-348 BC)

The philosopher Plato concluded that they must be the fundamental building blocks – the atoms – of nature, and assigned to them what he believed to be the essential elements of the universe.

12 pentagons meet to form a Dodecahedron

THE HEAVENS

20 triangles meet to form a Icosahedron

WATER

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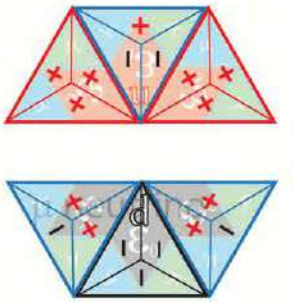
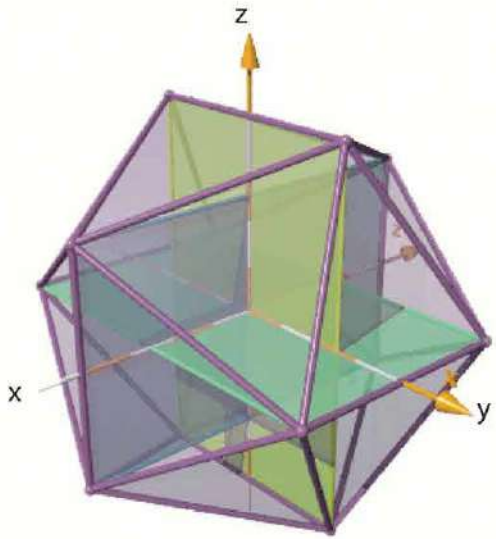
Tetryonic Solids

Despite their unique topologies Tetryonic solids are not unlike Platonic solids save that their toplogies are comprised entirely from complex hitherto undescribed **4nπ equilateral Planck mass-energy momenta geometries** that also match the Euler numbers of Platonic solids





mass geometries **4π** *tetryons* **4π** Matter topologies

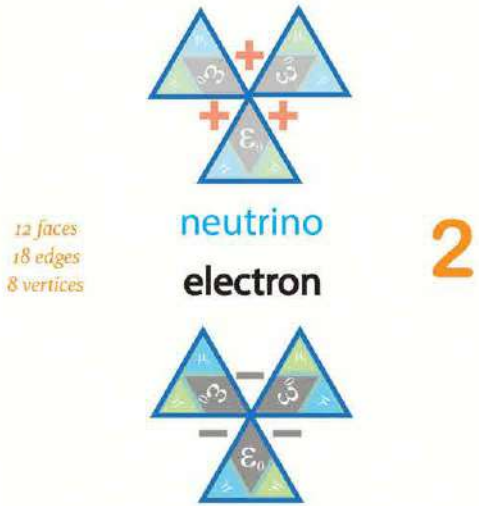
regular deltahedrons

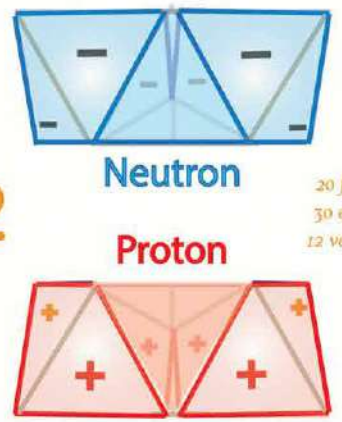
12π *leptons* **12π**

Matter topologies **8π** *quarks* **12π** mass geometries

regular deltahedrons

20π *Baryons* **36π**





Their equilateral topologies are best described as regular topologic-deltahedrons:

tetra-delta-hedrals	tetryons	4π external charge fascia
octa-delta-hedrals	quarks	8π external charge fascia
dodeca-delta-hedrals	leptons	12π external charge fascia
icoso-delta-hedrals	Baryons	20π external charge fascia

note:
Charged mass-energy fascia geometries and edges become "hidden" upon the meshing of delta-hedra to form Matter topologies

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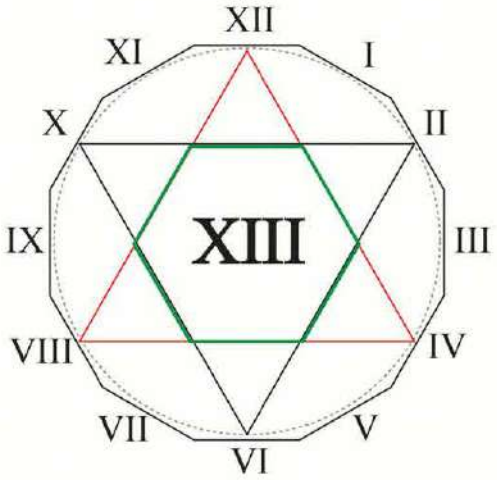
Euclidean geometry

Euclid

(c.330-275 BC, fl. c.300 BC)

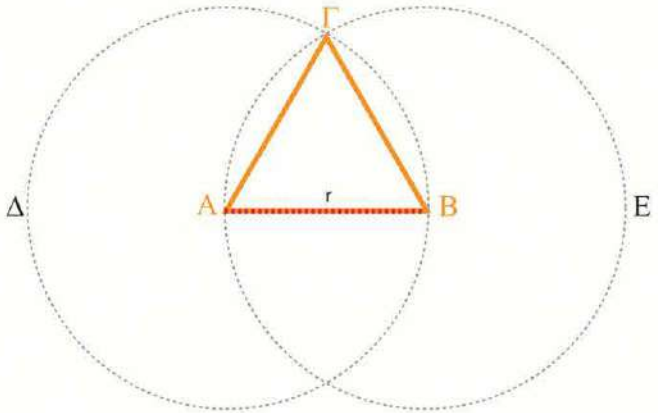
Arguably the most influential Mathematics book ever written is Euclid's 'The Elements'



In all, it contains 465 theorems and proofs, described in a clear, logical and elegant style, and using only a compass and a straight edge.

The Elements - Book 1 - Definition 20

Of the trilateral figures, an equilateral triangle is that which has its three EQUAL sides



Euclid's Elements - Book 1 - Proposition 1
Method of constructing an Equialteral triangle

Euclid's five general axioms were:

Things which are equal to the same thing are equal to each other.

If equals are added to equals, the wholes (sums) are equal.

If equals are subtracted from equals, the remainders (differences) are equal.

Things that coincide with one another are equal to one another.

The whole is greater than the part

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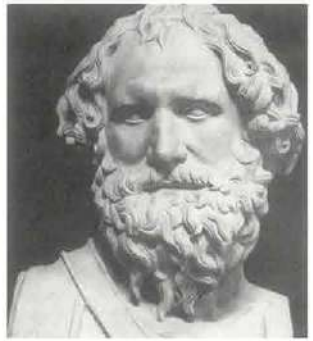
Archimedes



c. (287 BC – c. 212 BC)

As its definition relates to the circle,
π is found in many formulae in trigonometry and geometry,
especially those concerning circles, ellipses, or spheres.

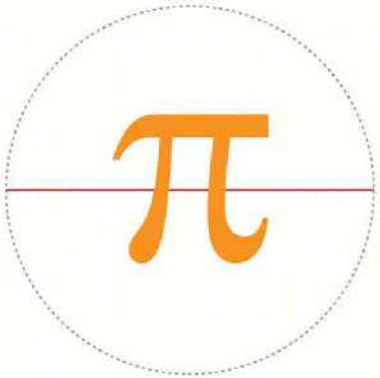
It is also found in formulae from other branches of science,
such as cosmology, number theory, statistics, fractals,
thermodynamics, mechanics, and electromagnetism

Incorrect identification of Pi [c/d] as opposed to Pi radians
in Physics has led to the inappropriate association
of spherical particles to the physical sciences
whereas equilateral triangles & tetrahedra
form its true geometry

The number π is a mathematical constant that is
the ratio of a circle's circumference to its diameter.

Pi

π is an irrational number
its decimal representation
never ends and never repeats.



$\pi = c/d$

The ratio C/d is constant,
regardless of the circle's size

3.141592654.....

Proof of the fact that C=2πr and how Archimedes proved it

Draw any circle.

Make a point anywhere on the circumference of the [green] circle.

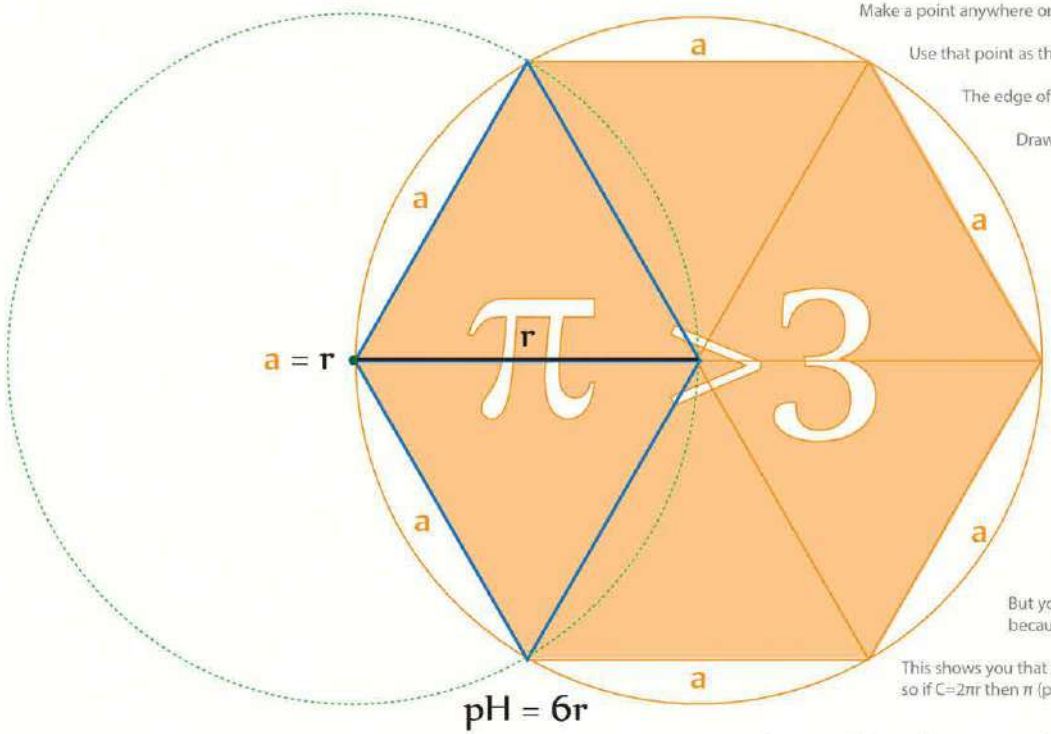
Use that point as the center of a second [blue] circle with the same radius as the green circle.

The edge of the blue circle should touch the center of the green circle.

Draw the line segment connecting the centers of the two circles.

That forms the radius of both of the circles.

Now draw the line connecting the center of the blue circle to where it crosses the green circle
on both sides, and complete the triangles.



You should have two equilateral triangles whose sides are equal to the radius of the green circle

Now extend all of the radius lines so they become diameter lines,
all the way across the circle, and finish drawing all of the triangles to connect them.

You've got six equilateral triangles now, that make an orange hexagon.

So the perimeter of your hexagon is the same as six times the radius of your circle.

But your circumference is a little bigger than the perimeter of your hexagon,
because the shortest distance between two points is always a straight line.

This shows you that the circumference of the blue circle has to be more than 6r,
so if C=2πr then π (pi) has to be a little bigger than 3, which it is.

The more sides we draw on our polygon, the closer we will get to the real value of pi (3.14159 etc.).
Using a polygon with 96 sides, Archimedes was able to calculate that π was a little bigger than 3.1408

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The Golden Ratio

Two quantities are in the golden ratio (φ) if the ratio of the sum of the quantities to the larger quantity is equal to the ratio of the larger quantity to the smaller one.

The figure to the right illustrates the geometric relationship

[1.61803]

L — Interior line length [LM] of the bisector line is equal to 1/2 the side of the original triangle [BC] [AB] or [CA] — M

Φ

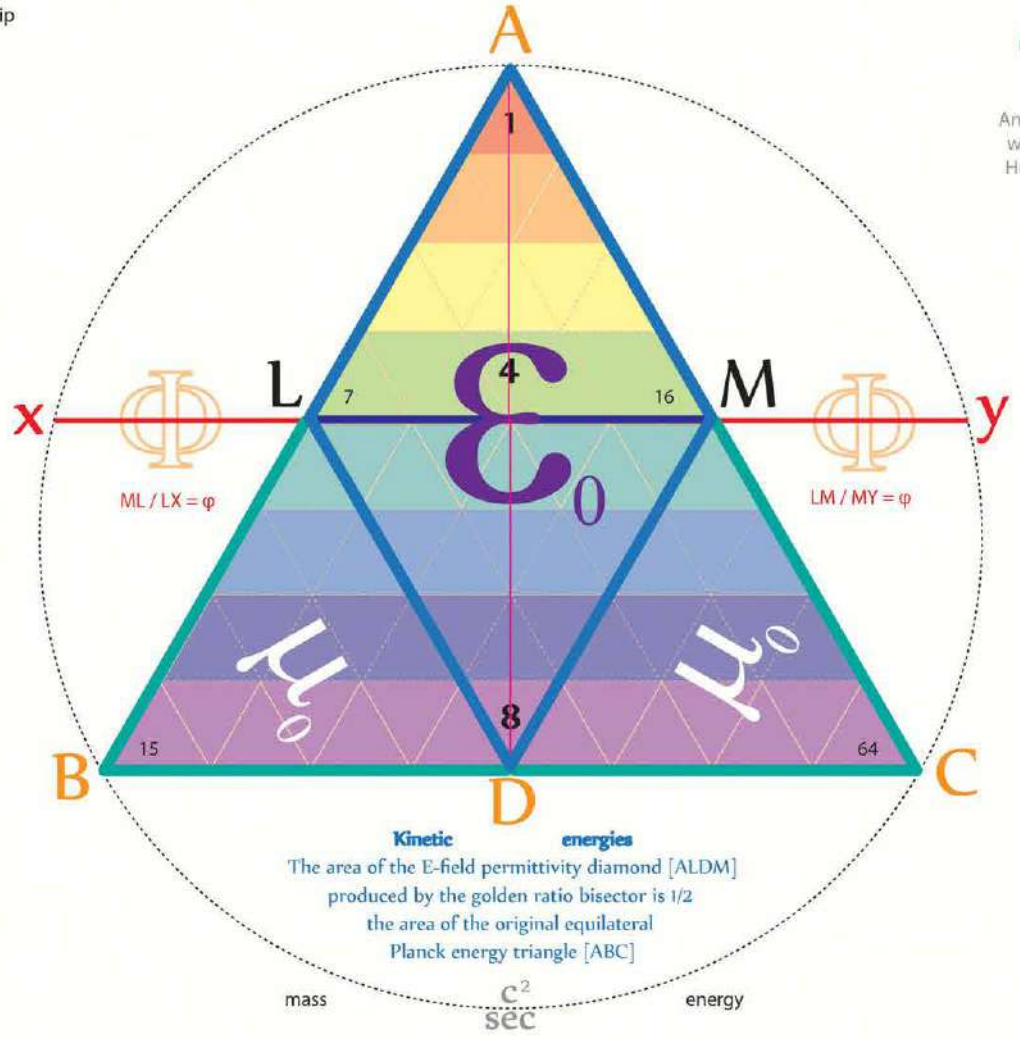
Golden ratio phi

$$\hbar = \frac{h}{2\pi}$$

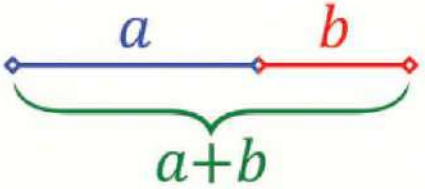
Tetryonic geometry reveals the maximum E-field amplitude of the reduced Planck constant to be an example of the Golden ratio in physics

velocity vectors

The height of the triangle [ALM] produced by the bisecting line is 1/2 the height of the height of [ABC]



Planck's constant [h]



$a+b$ is to a as a is to b

An intriguing showing of φ in an equilateral triangle was observed by George Odom, a resident of the Hudson River Psychiatric Center, in the early 1980s

M — The exterior lines [My] and [Lx] are Phi ratios of the interior line [LM] — y

Let L and M be the midpoints of the sides AB and AC of an equilateral triangle ABC

By measurement and the Intersecting Chords Theorem

MX·MY = AM·MC.

which is of the form

(a + b)·b = a·a.

Denoting a/b = x, we see that

$1 + x = x^2$,

George Odom

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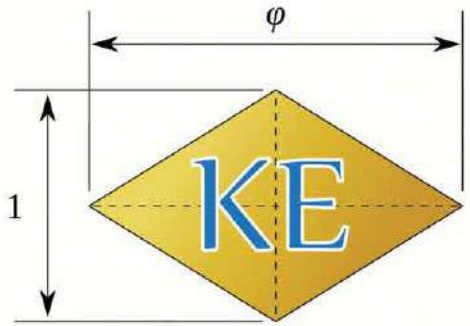
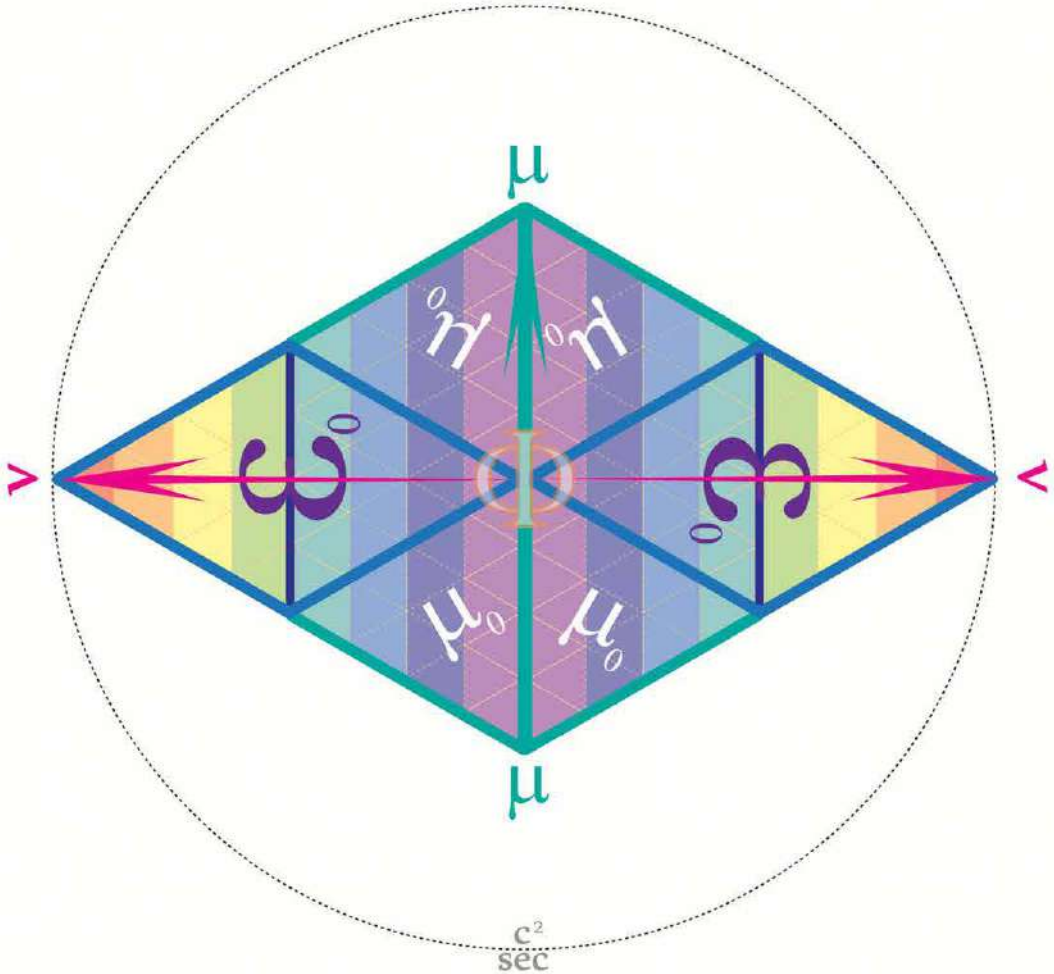


The Golden Rhombus

Applying the golden ratio (φ) to quantum scale electrodynamic geometry we can quickly determine that the linear momentum and magnetic moment vectors of photons & EM waves can also be expressed as a golden ratio

vector velocities
vs
magnetic vector

Φ
Golden ratio phi
[1.61803]



magnetic Force
vs
electric Force

photons
of
EM energy

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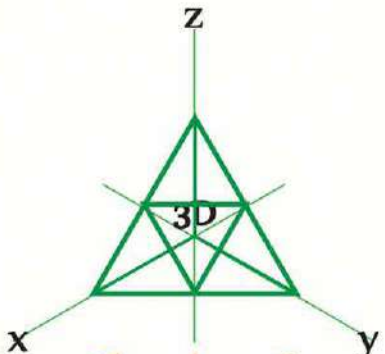
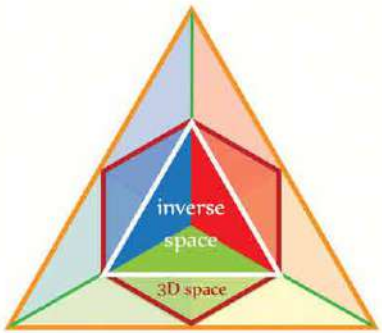
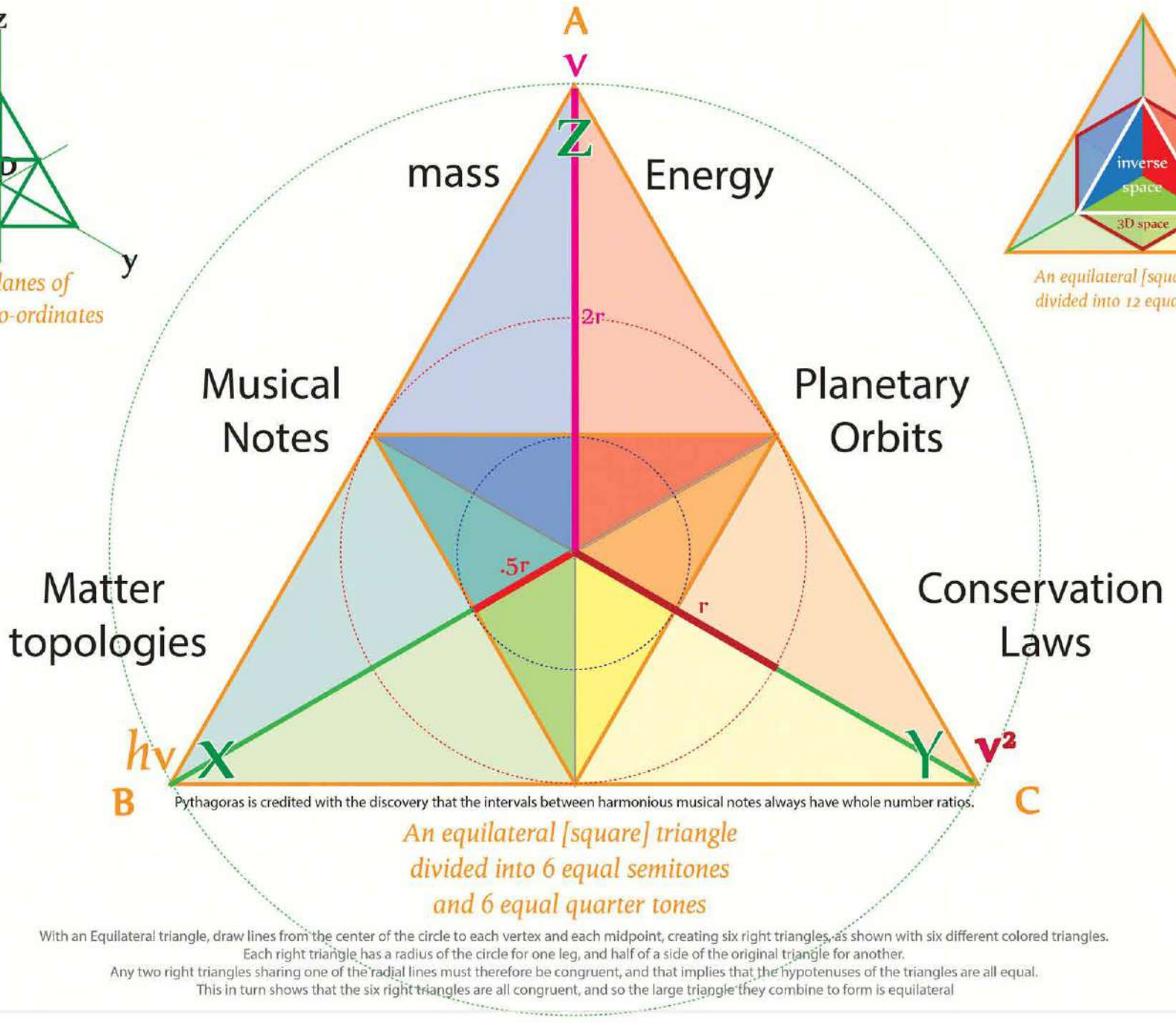


The 3 planes of Cartesian co-ordinates



An equilateral [square] triangle divided into 12 equal semitones



Pythagoras is credited with the discovery that the intervals between harmonious musical notes always have whole number ratios.

An equilateral [square] triangle divided into 6 equal semitones and 6 equal quarter tones

With an Equilateral triangle, draw lines from the center of the circle to each vertex and each midpoint, creating six right triangles, as shown with six different colored triangles.
Each right triangle has a radius of the circle for one leg, and half of a side of the original triangle for another.
Any two right triangles sharing one of the radial lines must therefore be congruent, and that implies that the hypotenuses of the triangles are all equal.
This in turn shows that the six right triangles are all congruent, and so the large triangle they combine to form is equilateral

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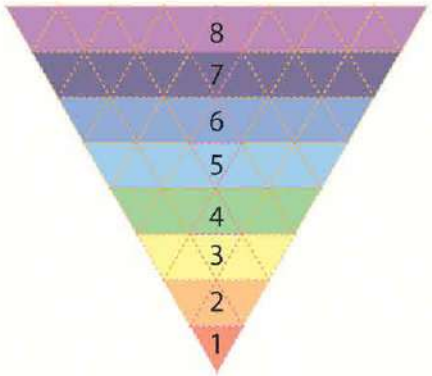
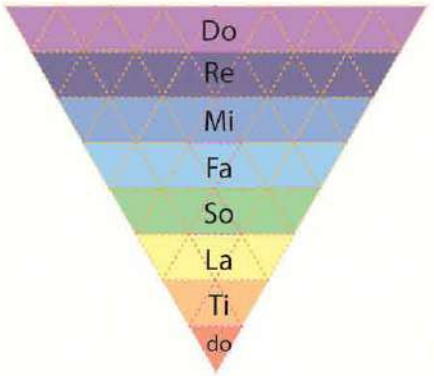
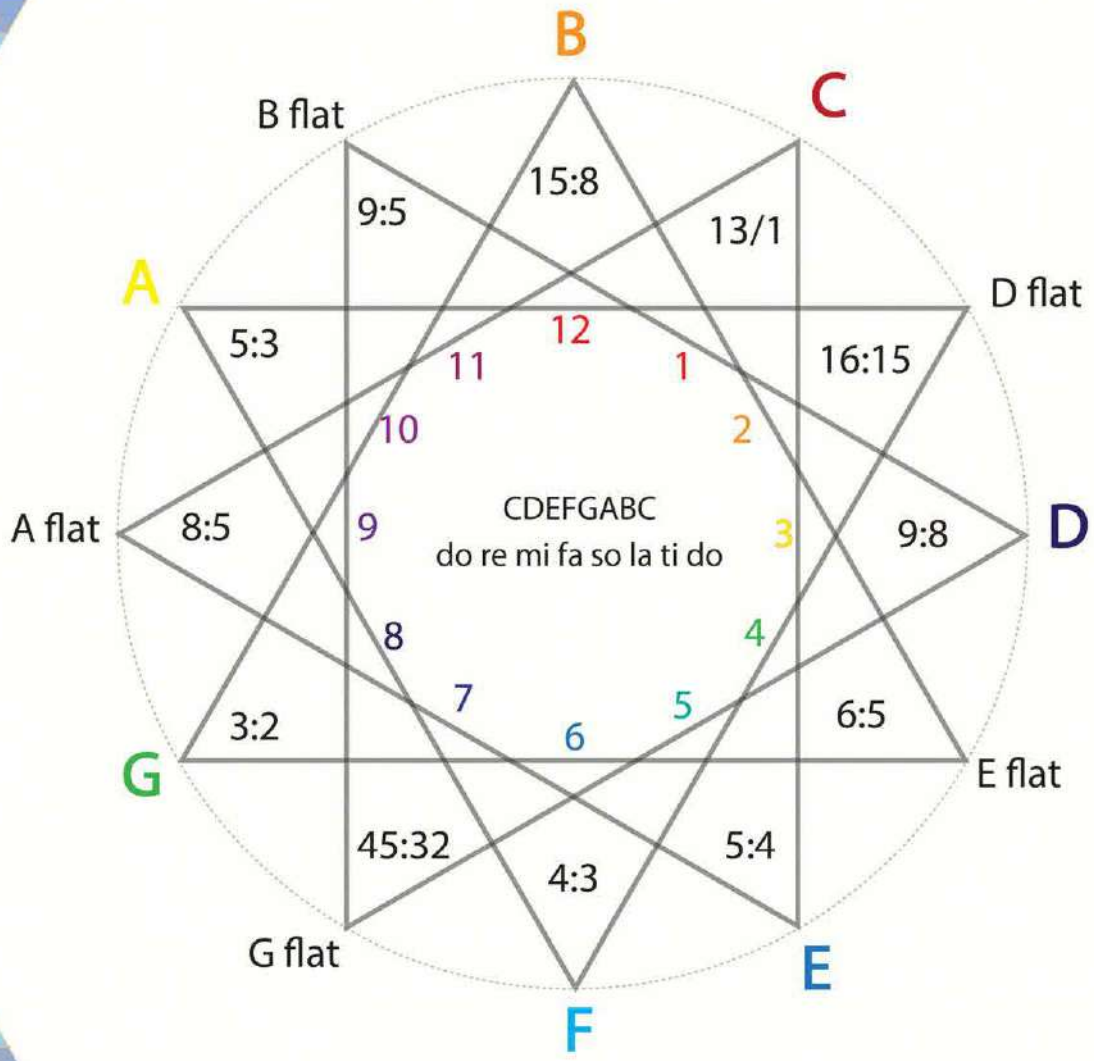
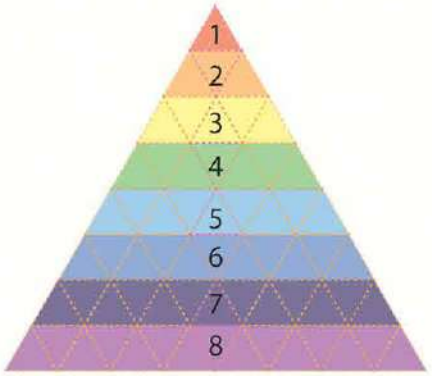
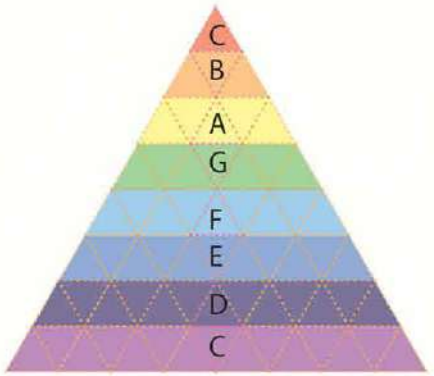
Equilateral Fifths











Musical Notes

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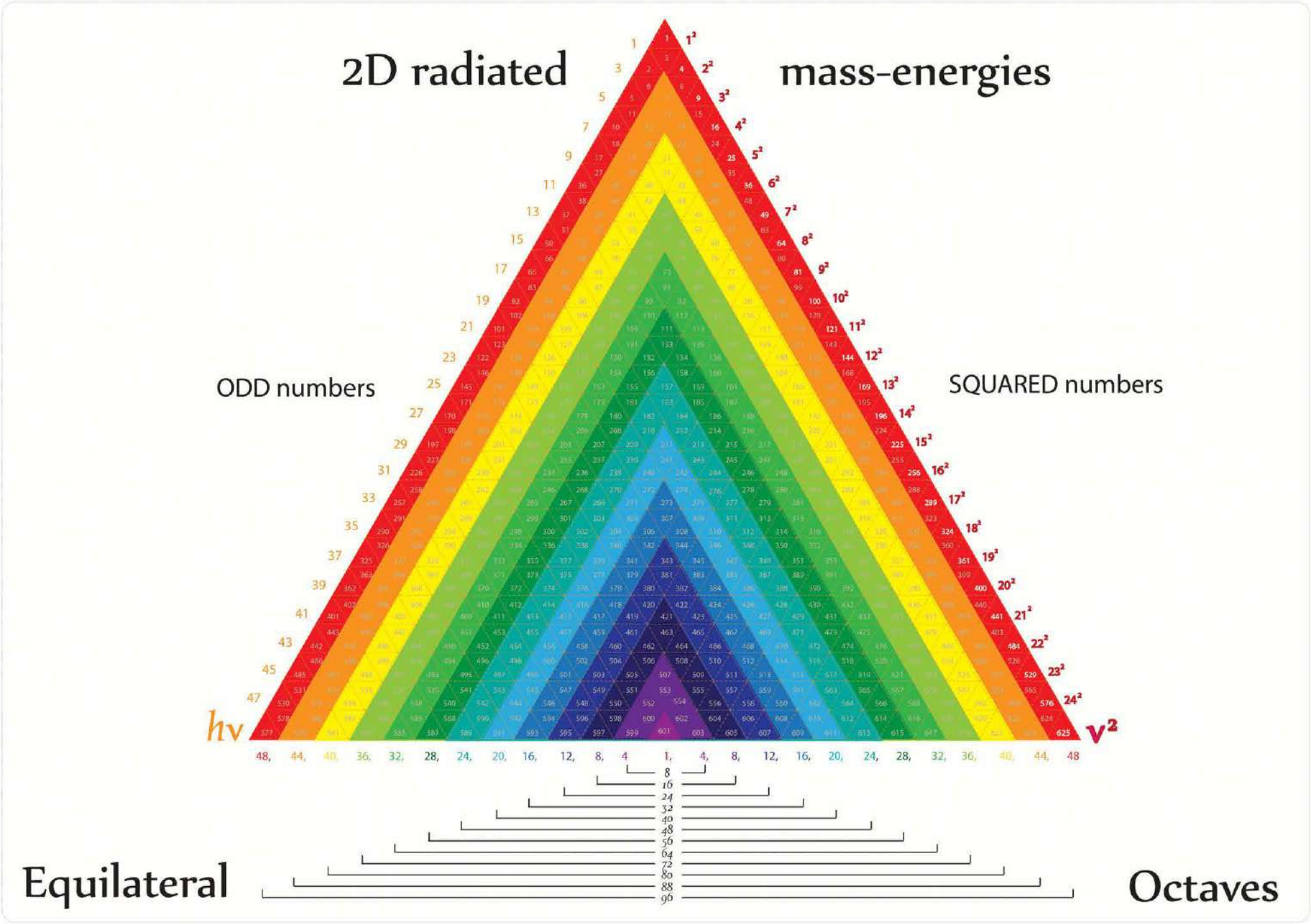

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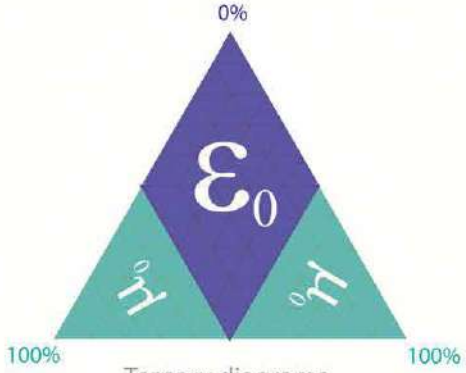
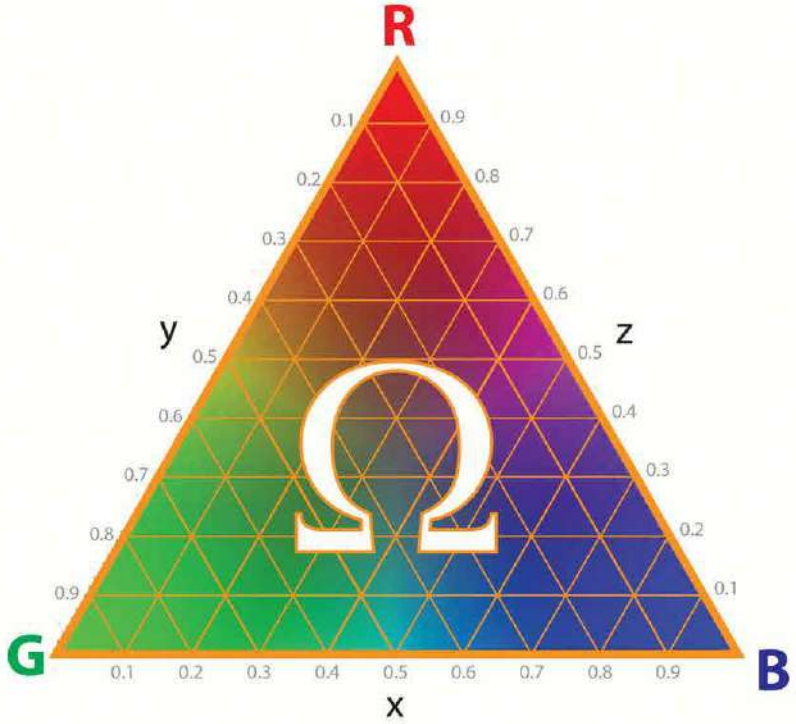
Ternary Diagrams

Viviani's Theorem implies that lines parallel to the sides of an equilateral triangle provide (homogeneous/barycentric/areal/trilinear) coordinates for ternary diagrams for representing three quantities A,B,C whose sum is a constant (which can be normalized to unity).

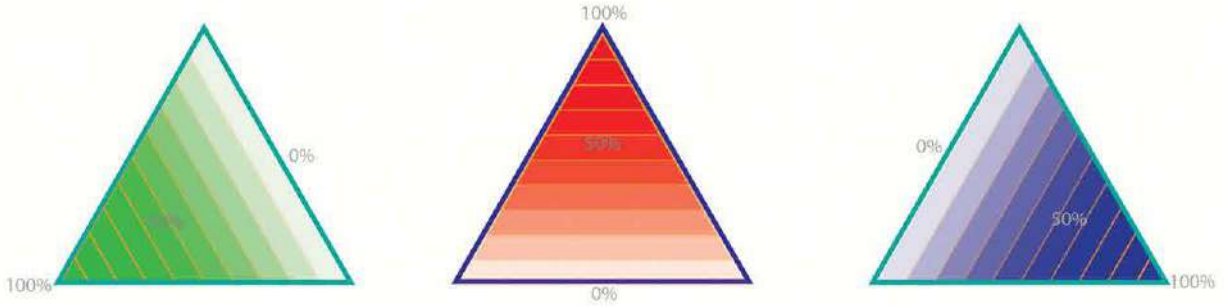


Ternary diagrams should NOT be used to model EM field strengths



In a ternary plot, of EM energy the Electric field [E] and the Magnetic dipole [N-S] must renormalise to 1

A ternary diagram is simply a triangular coordinate system in which the 3 edges correspond to the axes.



Trilinear charts are commonly used for finding the result of mixing three components (such as gases, chemical compounds, soil, color, etc.) that add to 100% of a quantity.

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Whilst the Pythagorean Theorem boasts a slightly greater economy of terms than the Eutrigon Theorem (Wayne Roberts 2003), the latter contains an important area not included in the former:

the area enclosed or swept out by the three points of the triangle in question

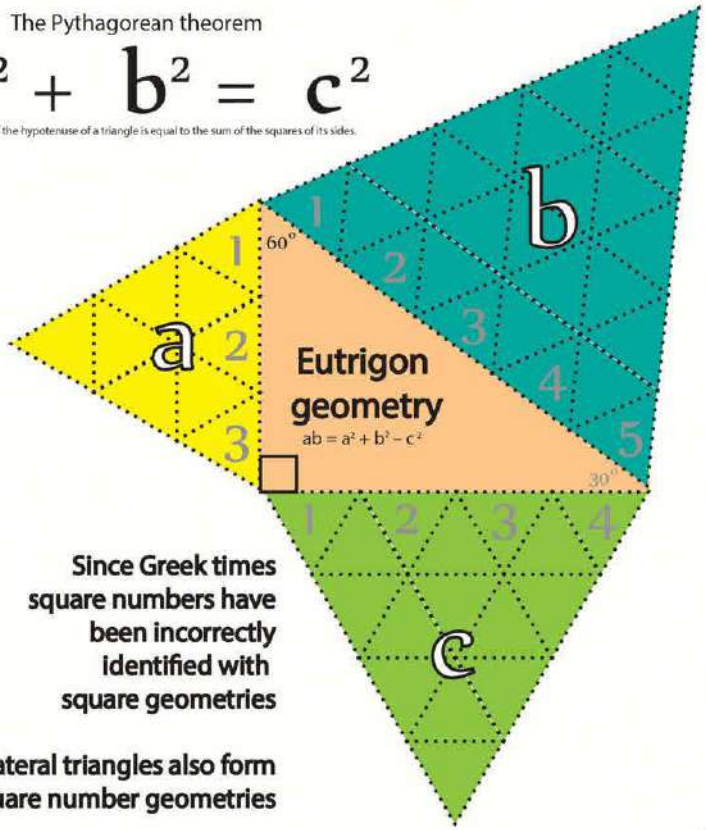
$$ab = a^2 + b^2 - c^2$$

the area of any eutrigon is equal to the combined areas of the equilateral triangles on legs 'a' and 'b', minus the area of the equilateral triangle on its hypotenuse 'c'.

The Pythagorean theorem

$$a^2 + b^2 = c^2$$

The square of the hypotenuse of a triangle is equal to the sum of the squares of its sides.



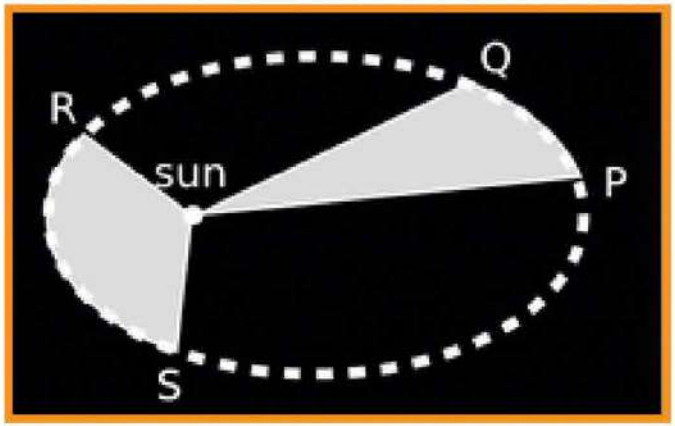
Since Greek times square numbers have been incorrectly identified with square geometries

Equilateral triangles also form square number geometries

Eutrigons

are an important new class of triangle (mathematically defined by Wayne Roberts), as the analogue of the right-triangle in orthogonal (Cartesian) coordinate geometry

Kepler's Second Law of planetary motion



The orbit of every planet is an ellipse with the Sun at one of the two foci.

A line joining a planet and the Sun sweeps out equal areas during equal intervals of time.

The algebraic form of the Eutrigon Theorem, (like the algebraic form of Pythagoras' Theorem), is proven to be special case of the Cosine Rule...

Tetryonic theory reveals the equilateral [square] energy geometry that reveals the 'harmonics at play' in physical laws such as the second law of Kepler, and in many other phenomena in physics, chemistry, cosmology, biochemistry and number theory thus providing the foundation for the mathematics of quantum mechanics

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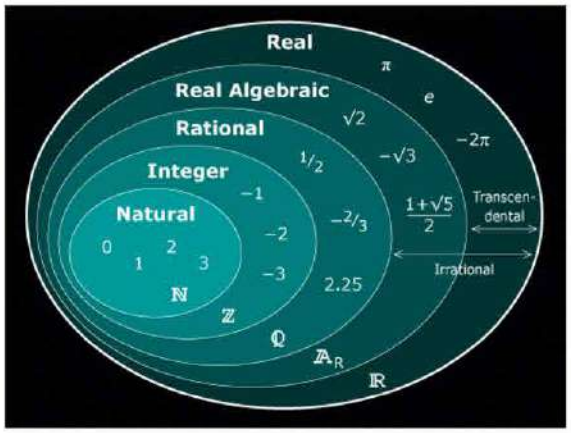
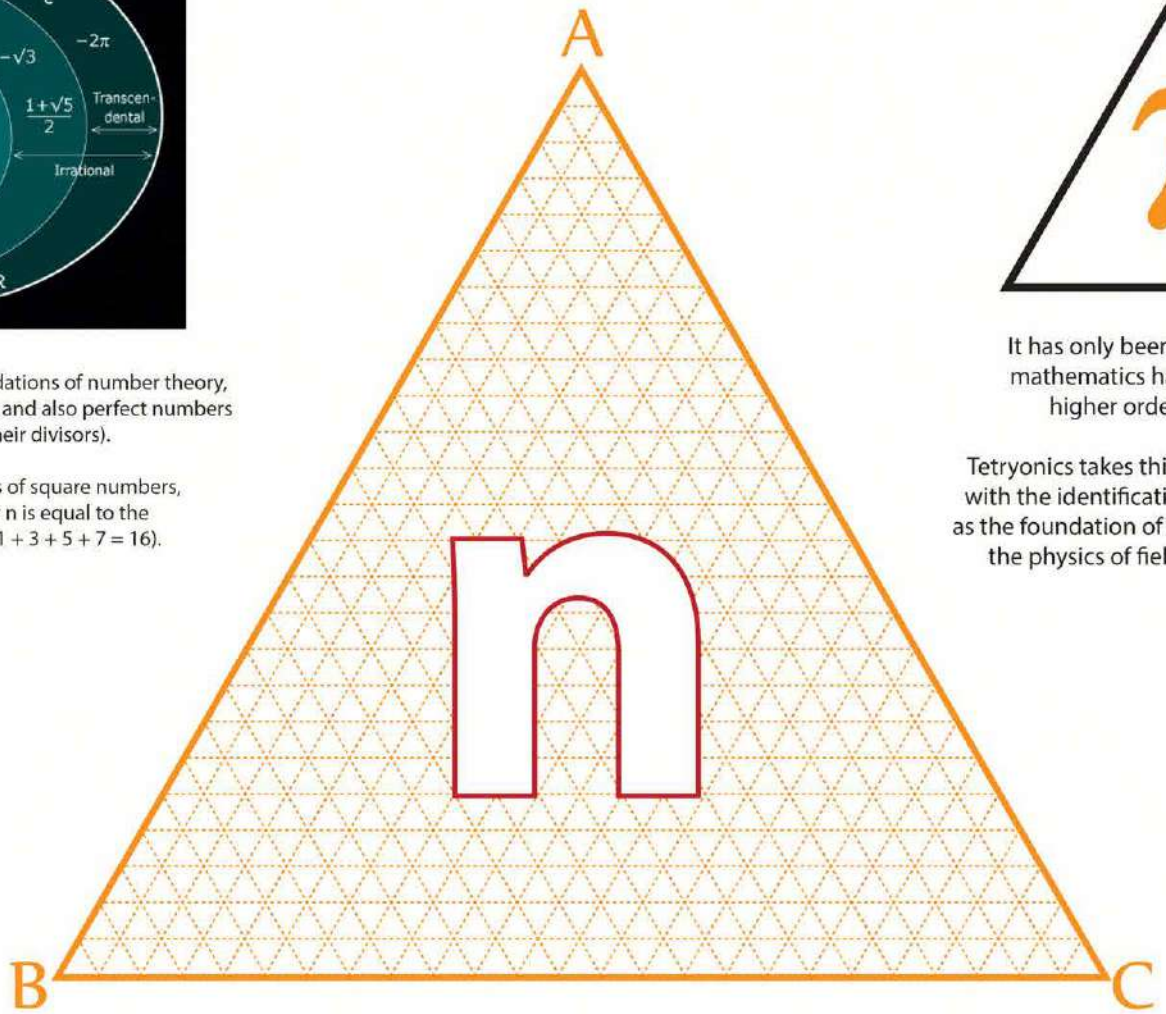
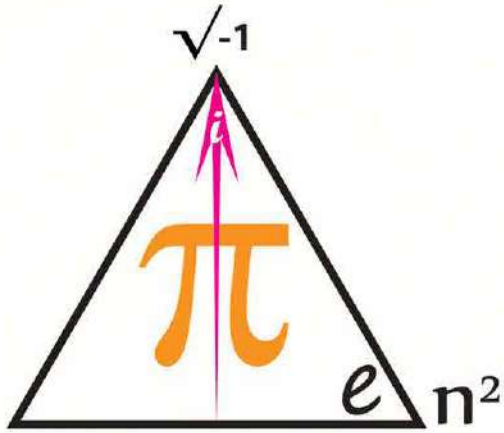
Number theory



The Pythagoreans also established the foundations of number theory, with their investigations of triangular, square and also perfect numbers (numbers that are the sum of their divisors).

They discovered several new properties of square numbers, such as that the square of a number n is equal to the sum of the first n odd numbers (e.g. 1 + 3 + 5 + 7 = 16).





It has only been in recent centuries that mathematics has begun to explore the higher order irrational numbers

Tetryonics takes this investigation to new levels with the identification of equilateral geometries as the foundation of transcendental numbers and the physics of fields and particles in motion

What mathematics has failed to appreciate is the significance application of equilateral geometries to the 'square' numbers of physics and science in general

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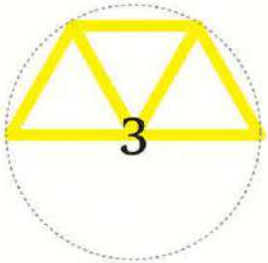
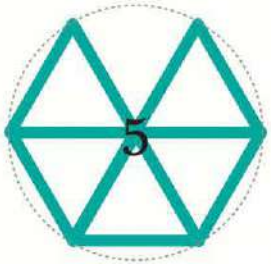
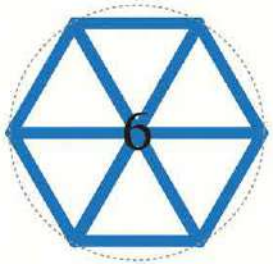
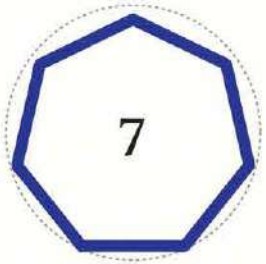
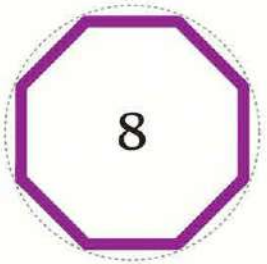


TETRYONICS

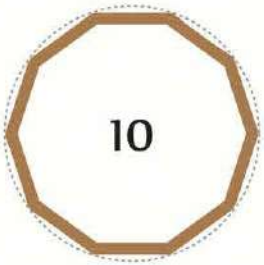


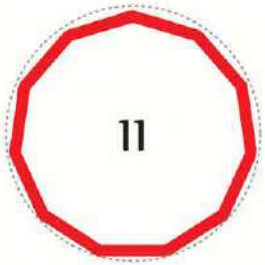






COUNTING POLYGONS





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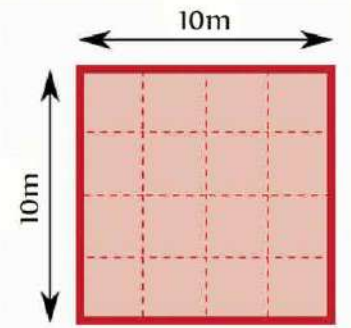
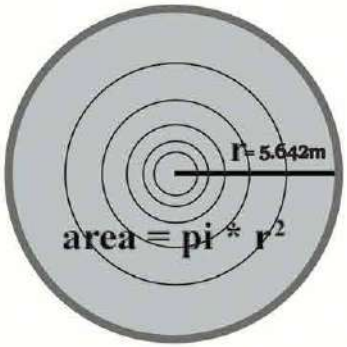
SQUARED energies in quantum mechanics are EQUILATERAL geometries



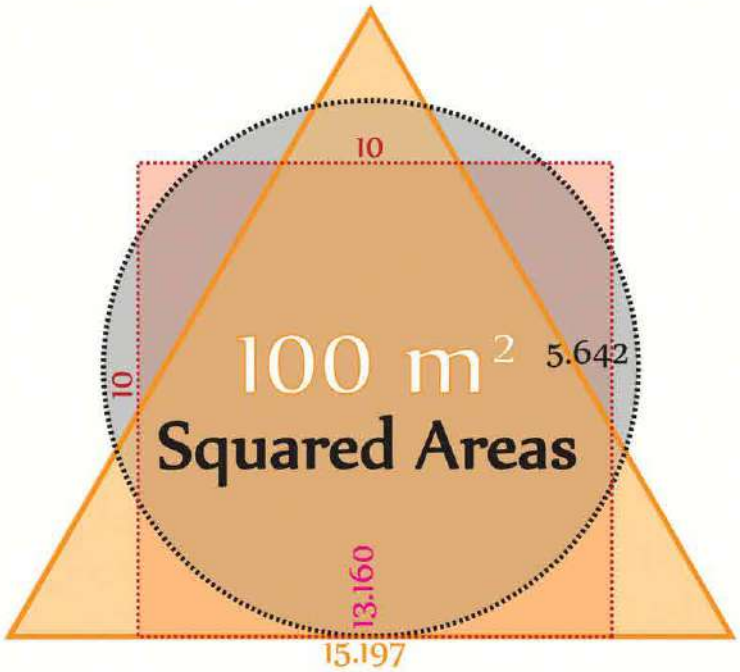
Square

area = s^2 = [100]

Circles



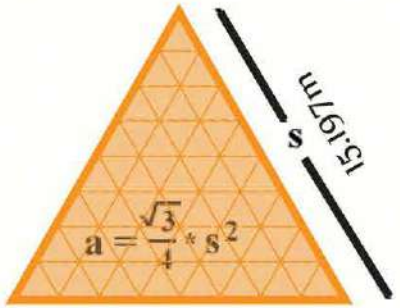
= pi *$[5.642]^2$
= 100



can be created by a number of planar geometries

For a long time it has been assumed by scientists (and mathematicians) that circular [and squared] geometries are the geometric foundation of all physics, leading to a serioulsy flawed model of particles and forces in quantum mechanics

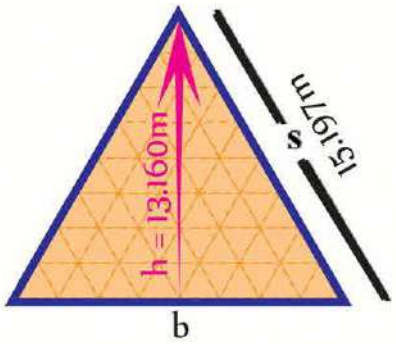
Tetryonic theory now reveals that quantised equilateral angular momenta creates the foundational geometry of all the mass-Energy-Matter & forces of physics



Equilateral

area = $(\frac{1}{2}*b)*h$

Triangles



b h
[.5x15.197] x 13.160
= 100

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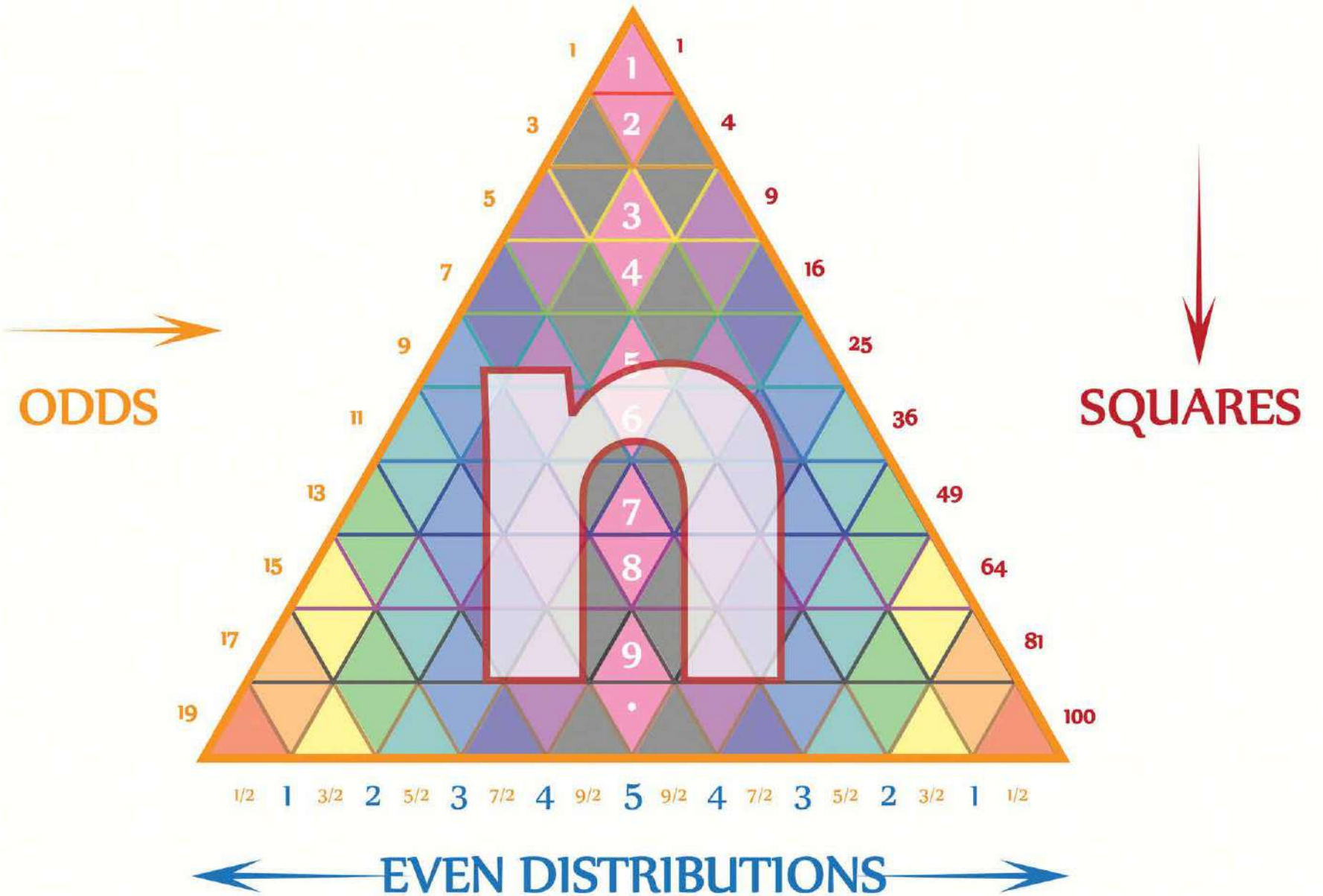
0.987654321

SQUARE ROOTS

80/81



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Integers

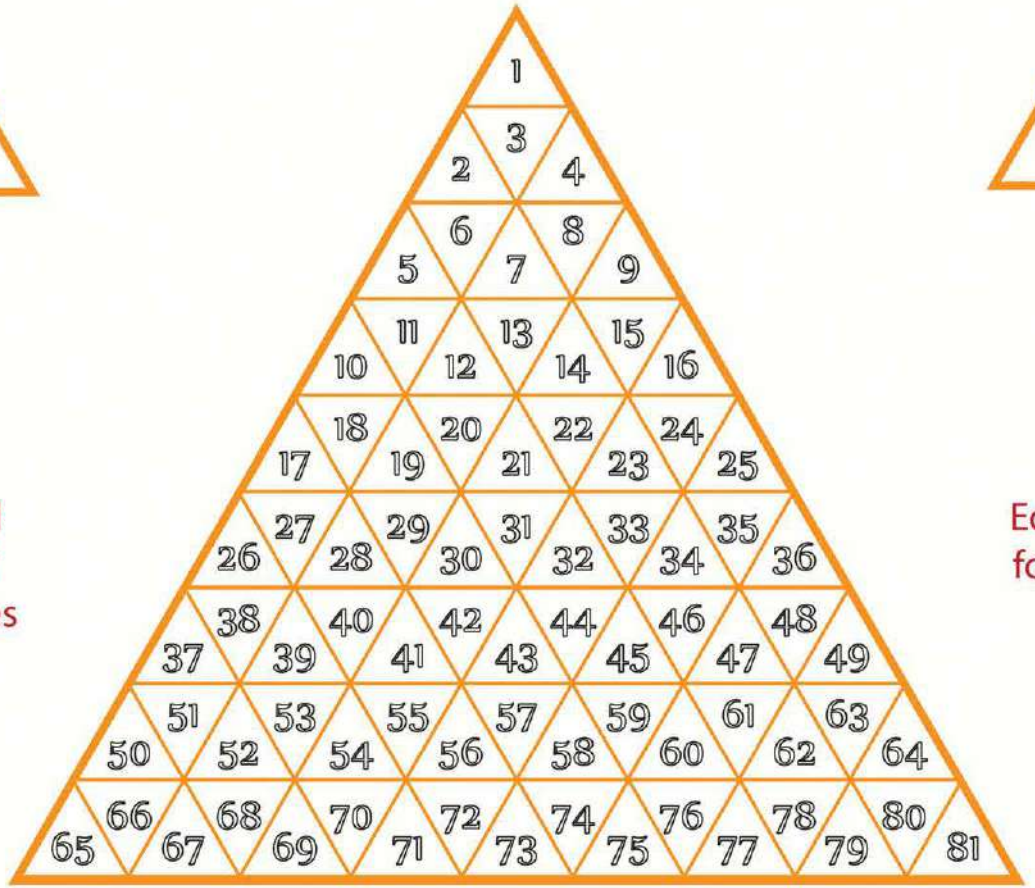
The integers (from the Latin integer), literally "untouched", hence "whole"
in Tetryonics it is the basis for the Planck charge quantum

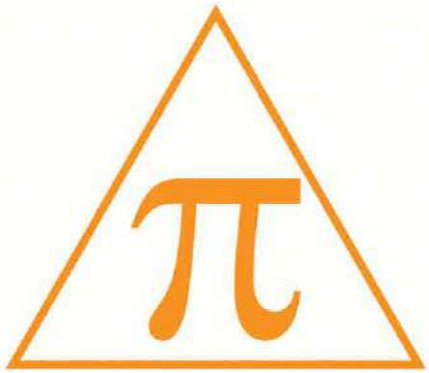
$$2n-1$$

$$[n] + [n-1]$$

Triangular numbered geometries are NOT equialteral geometries

0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...





$$\sum_{1}^{n} [2n-1]$$

Equilateral geometries form **SQUARE** number geometries

1, 4, 9, 16, 25, 49, 64, 81, 100, 121, 144, ...

Equilateral energy quanta form a normal longitudinal distribution

Viewed as a subset of the real numbers, they are numbers that can be written without a fractional or decimal component

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Bosons are a transverse measure of scalar energy momenta

ODD numbers

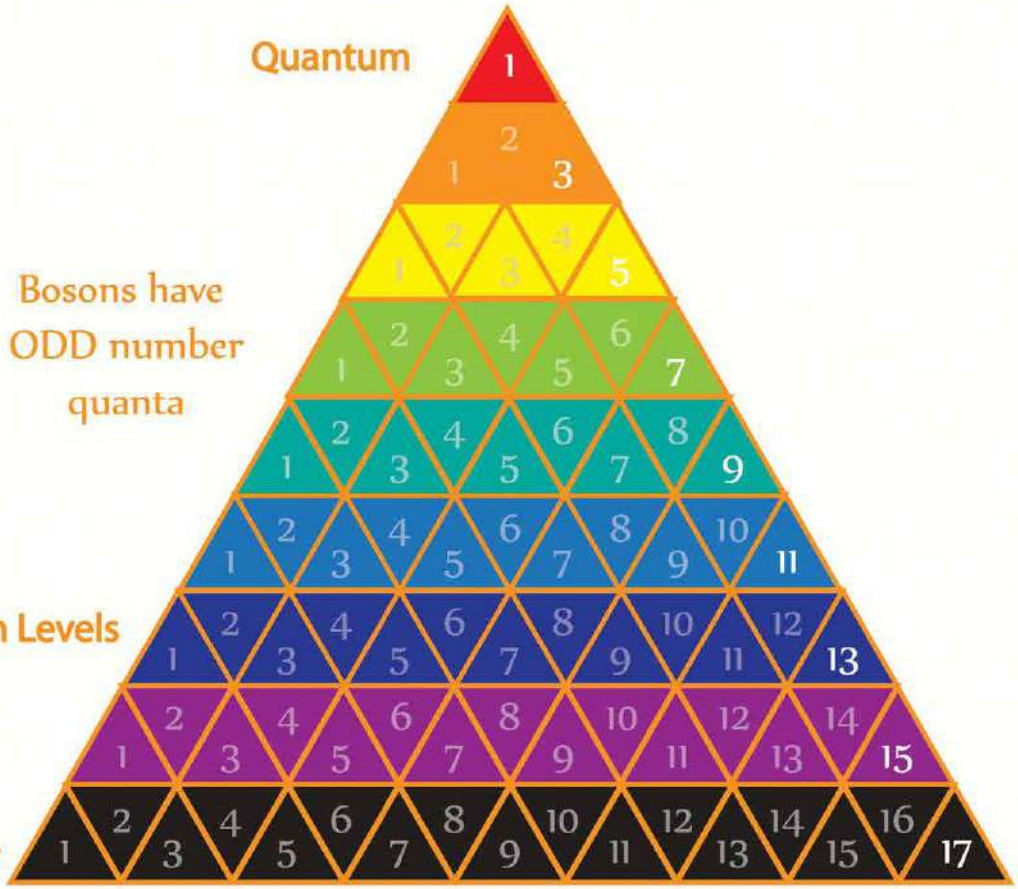
An odd number is an integer which is not a multiple of two.

Quantum

Bosons have ODD number quanta

Quantum Levels

$h\nu$



1 3 5 7 9 11 13 15 17

An odd number, when divided by two, will result in a fraction

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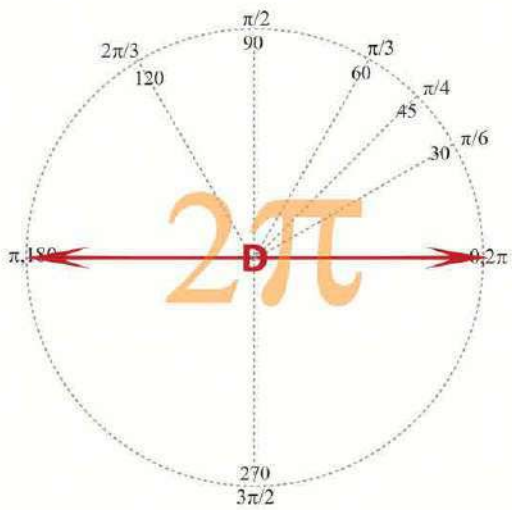
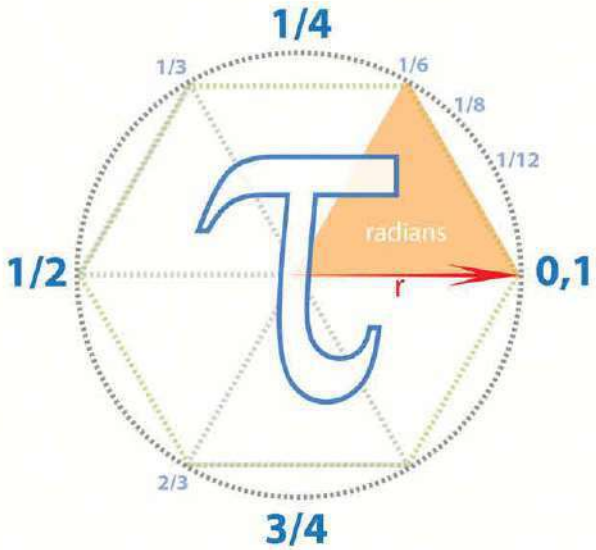
Tau radians

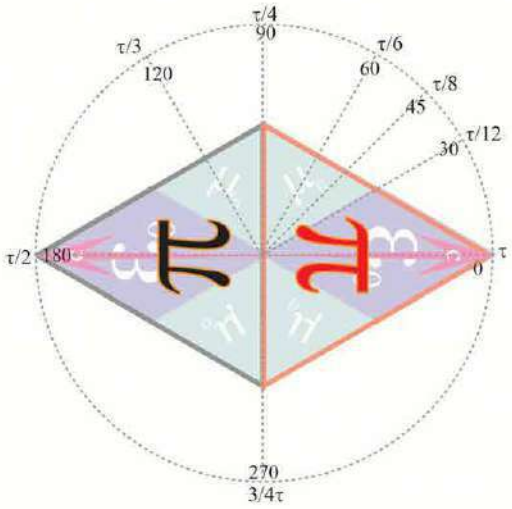
Around the whole outside of a circle,
there are about 6.283 radians - or, Tau radians

3.141592654

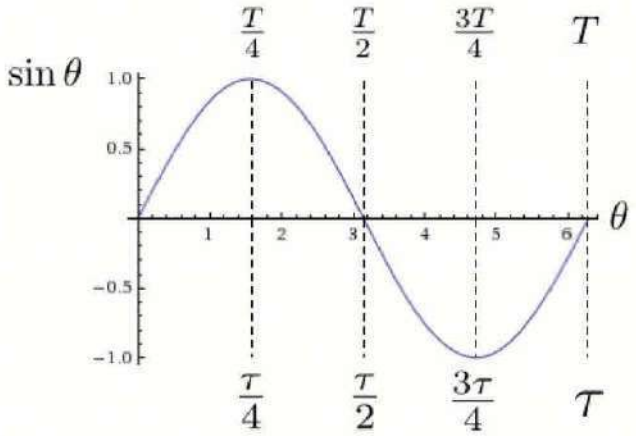




6.283185307



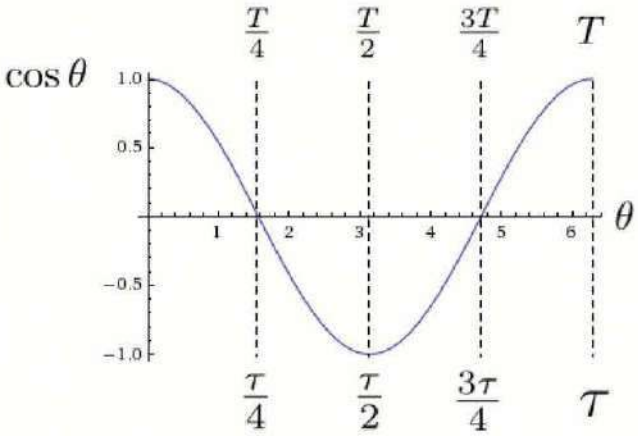
τ is a more 'natural' radian system for geometric physics than π
Tau = 2π = 360 degree rotation about a point



π
historically defined as the
ratio of a circle's circumference to its DIAMETER
should be redefined in physics to

τ
the ratio of its circumference to its RADIUS

in doing so many of the π/2 terms common to physics
will re automatically rationalised and will better reflect
the Tetryonic geometry of mass-ENERGY-Matter in motion



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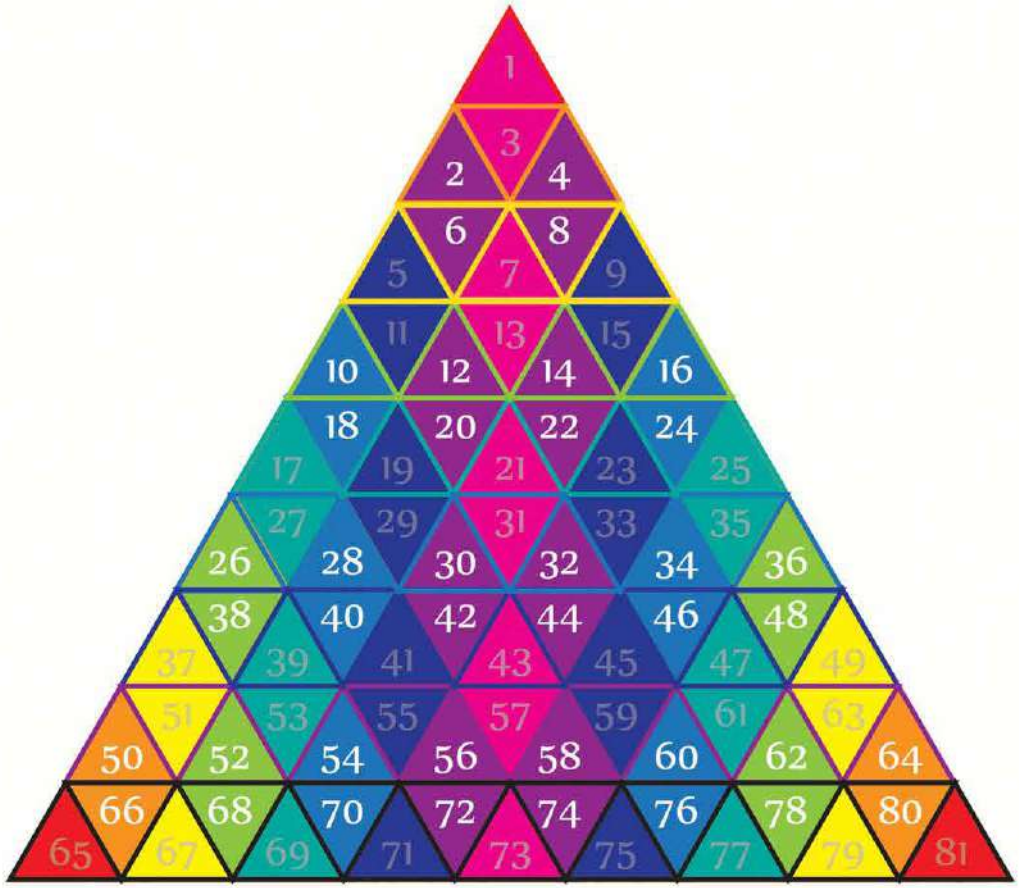
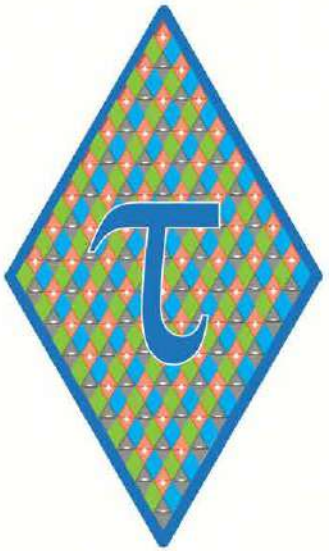
Photons are a longitudinal measure of scalar energy momenta

Photons are EVEN number quantums

EVEN numbers

An integer that is not an odd number is an even number





EM waves are comprised of EVEN numbered quanta

If an even number is divided by two, the result is another whole number

1/2 1 3/2 2 5/2 3 7/2 4 9/2 4 7/2 3 5/2 2 3/2 1 1/2

If an odd number is divided by two, the result is a fractional number

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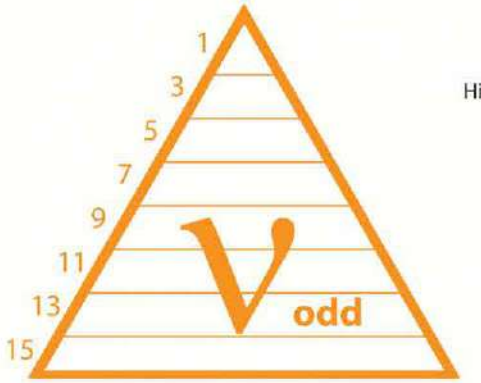
Triangular numbers

Historically, a triangular number counts quanta that can pack together to form an equilateral triangle

1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...

this form of geometric counting of same charges over-complicated the simpler physical reality

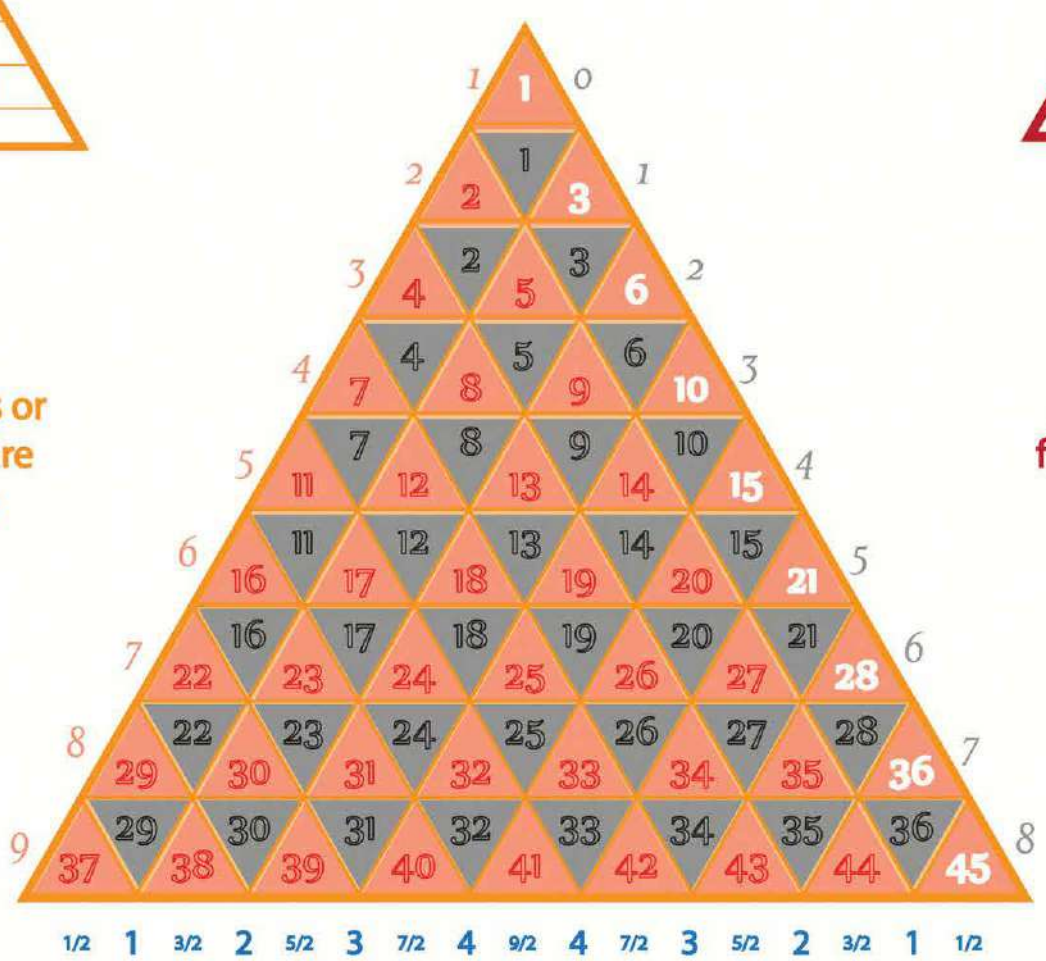


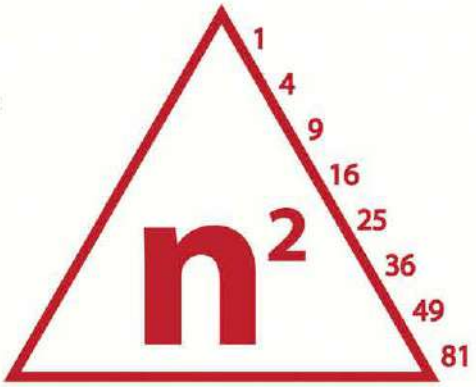
$$2v-1$$

$$[v] + [v-1]$$

Equilateral chords or quantum levels are ODD numbers

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21,....





$$\sum_{1}^{n} [2n-1]$$

Equilateral geometries form SQUARE numbered geometries

1, 4, 9, 16, 25, 49, 64, 81, 100, 121, 144, ...

1/2 1 3/2 2 5/2 3 7/2 4 9/2 4 7/2 3 5/2 2 3/2 1 1/2

Triangular energy quanta form normal distributions

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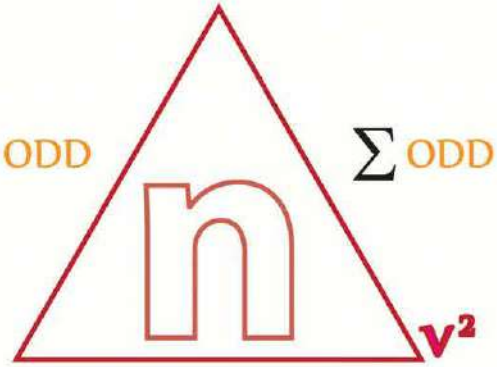
Squared numbers

A square number, sometimes also called a perfect square,
is the result of an integer multiplied by itself



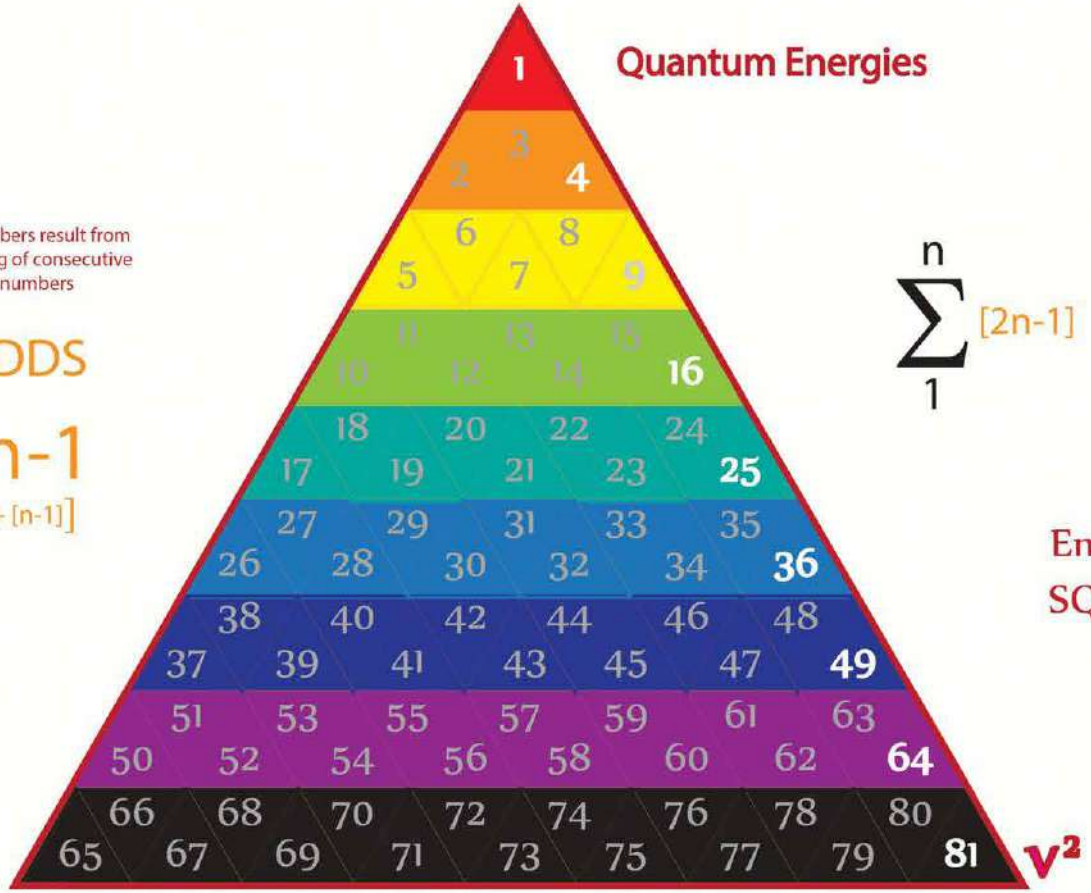
1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17

Square numbers result from the summing of consecutive ODD numbers

ODDS

2n-1

[n] + [n-1]



$$\sum_{1}^{n} [2n-1]$$

Energy levels have SQUARE number quanta

Compton Frequency

In Tetryonics Square numbers produce equilateral geometries

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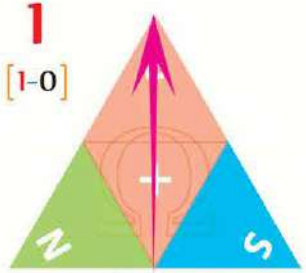
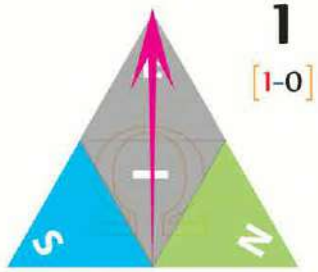
Square roots

A square root of a number is a number that, when it is multiplied by itself (squared) , gives the first number again.

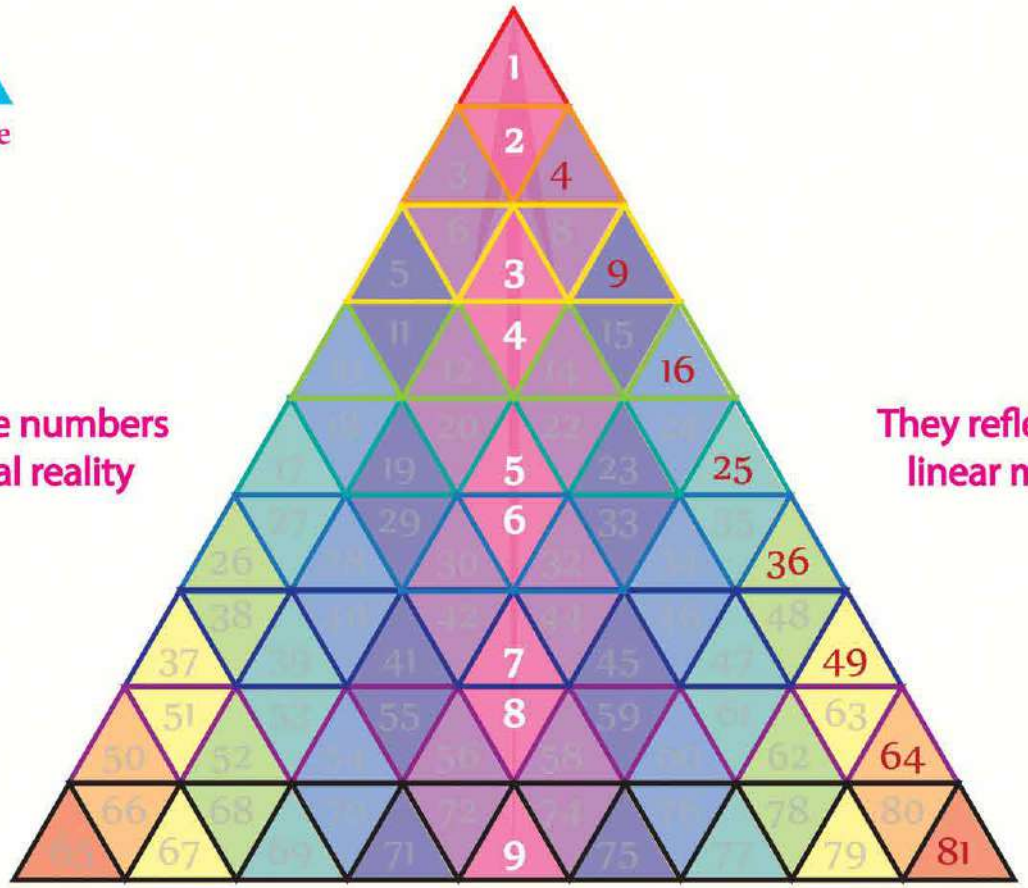


Root of positive one

-*i* and +*i*



Root of negative one



Square roots of negative numbers have a basis in physical reality

They reflect the real non-negative linear momentum of a system

A whole number with a square root that is also a whole number is called a perfect square
in Tetryonic theory they are actually equilateral geometries

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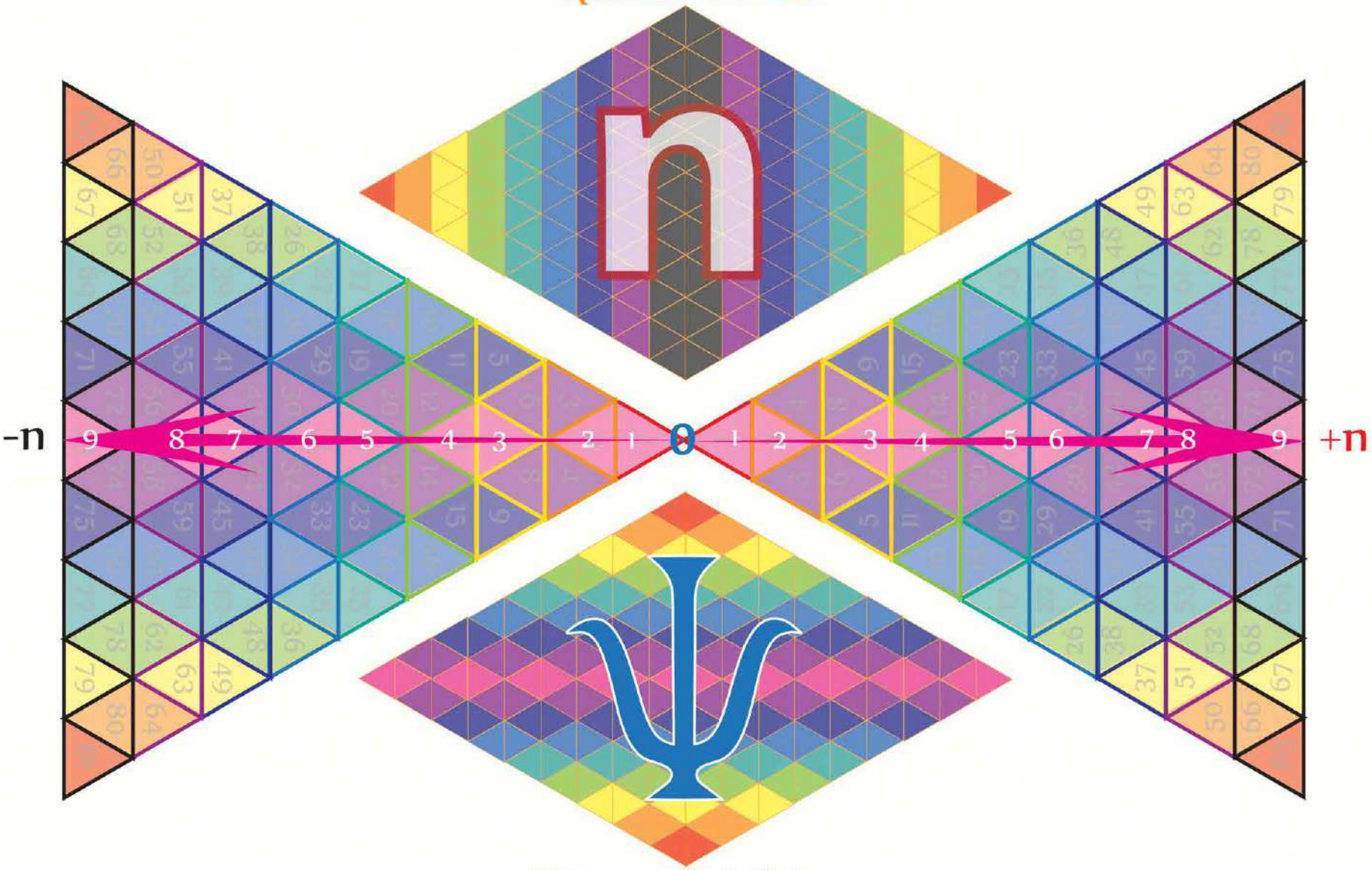
Real Numbers

In mathematics, a real number is a value that represents a quantity along a continuous line. The real numbers include all the rational numbers,

Quantum levels



Wave probabilities

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ONE to ∞^2

Quantum levels

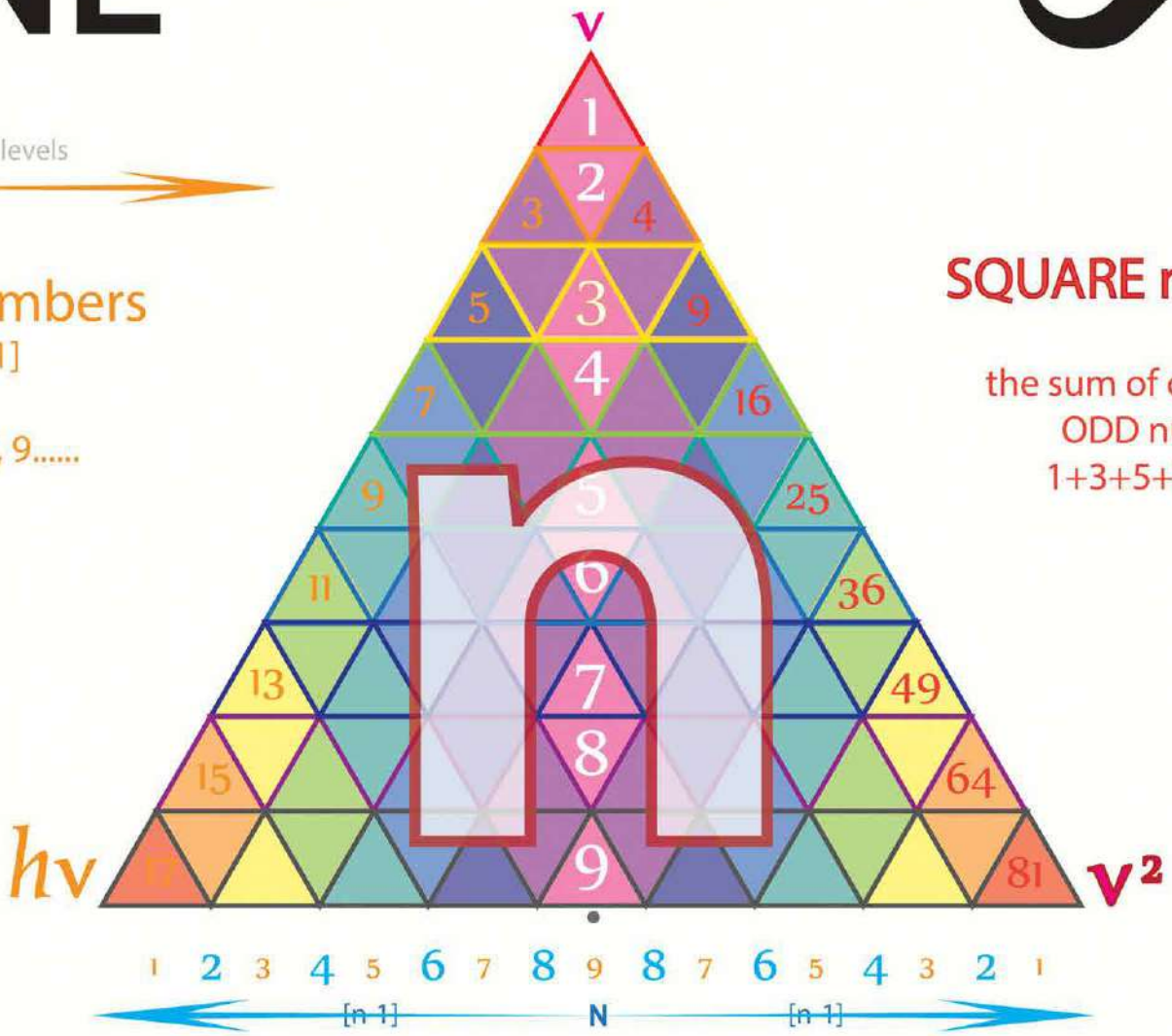
ODD numbers
[2n-1]

1, 3, 5, 7, 9.....

SQUARE numbers

the sum of consecutive
ODD numbers
1+3+5+7+9+.....

Scalar Energies



Linear energy momentum

NORMAL DISTRIBUTION

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Basic Properties of nested scribed Equilateral Triangles

Given an equilateral triangle of side s

altitude

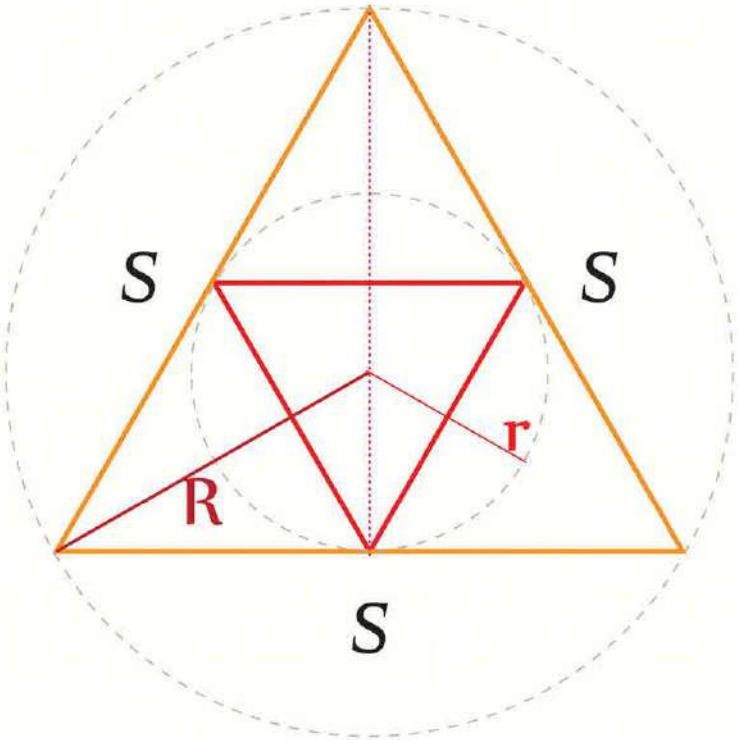
$\sqrt{3/2}\,S$

$3S$

perimeter

$\sqrt{3/4}\,S^2$

area



$\sqrt{3/6}\,S$

in-radius

$\sqrt{\pi/12}\,S^2$

in-circle area

circum-radius

$\sqrt{3/3}\,S$

circum-circle area

$\sqrt{\pi/3}\,S^2$

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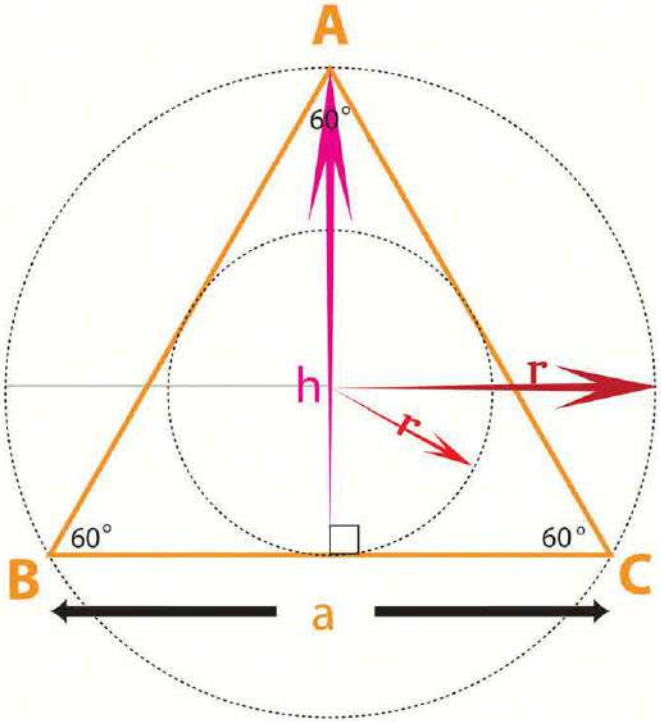
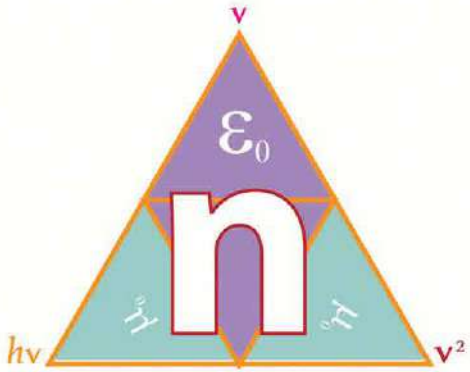
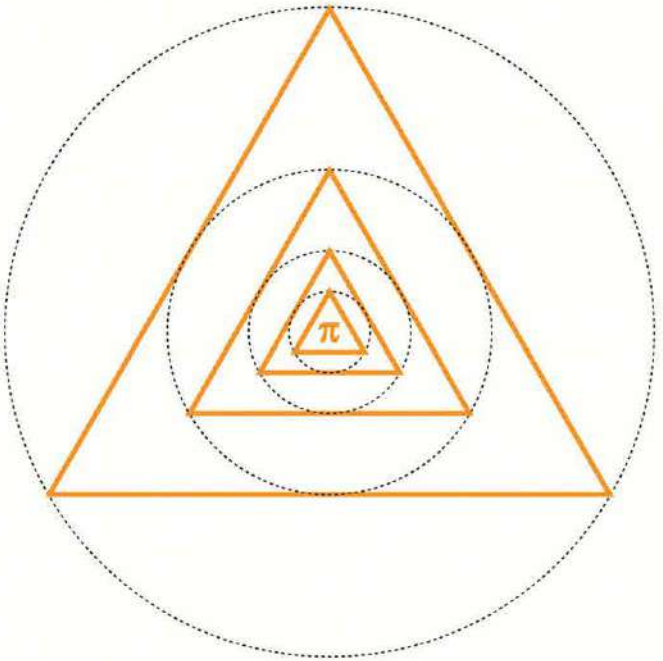
Tetryonic [equilateral] geometry

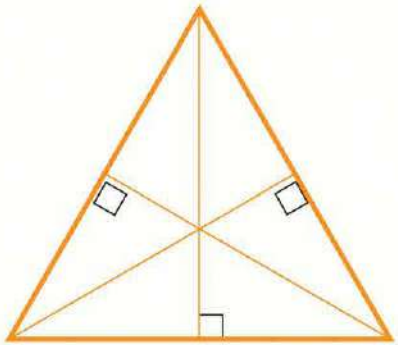




The equilateral triangle exhibits 'square symmetry'
it can always be divided into n^2 [number]
of smaller self-similar parts

All triangles are flat euclidean π radian geometries [180°]





An equilateral triangle is the most symmetrical triangle,
having 3 lines of reflection and rotational symmetry of order 3 about its center

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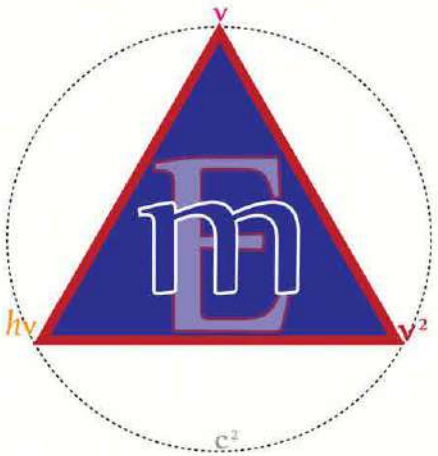
CHARGE

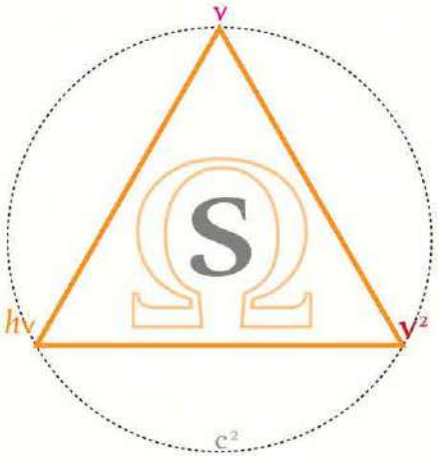
Scribed equilateral geometries

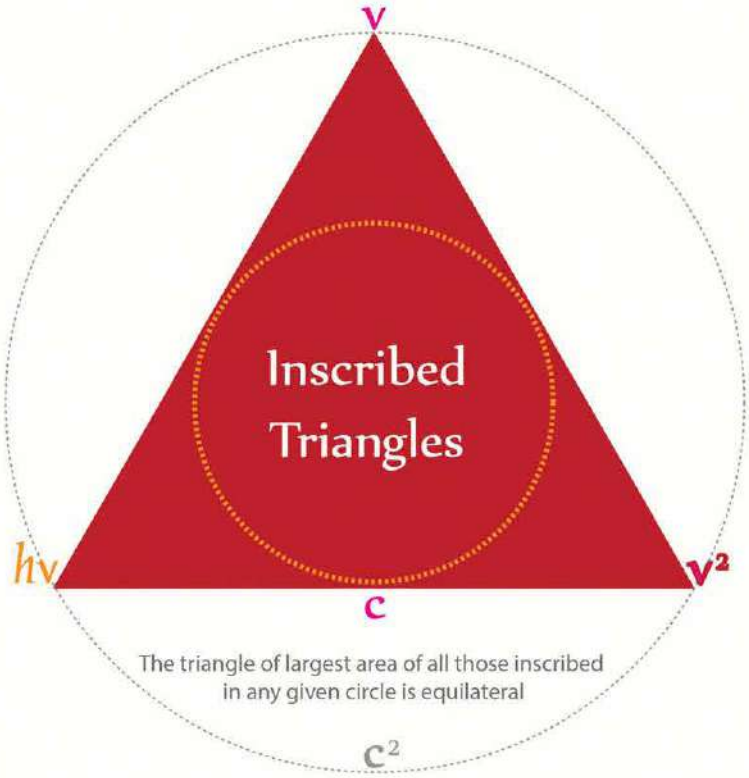
reflect space-time's geometric relationship with charged mass-energy

Energy



QAM





Energy per spatial unit

mass

QAM per spatial unit

seconds

$$m = \frac{E}{c^2}$$

$$\frac{\Omega}{c^2} = s$$

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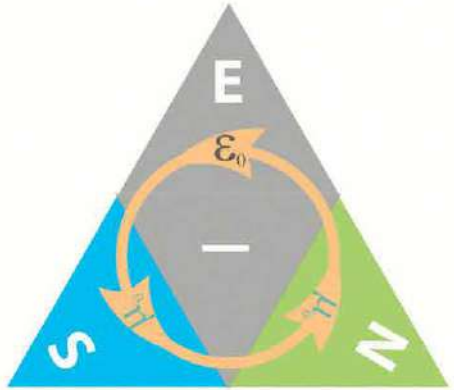
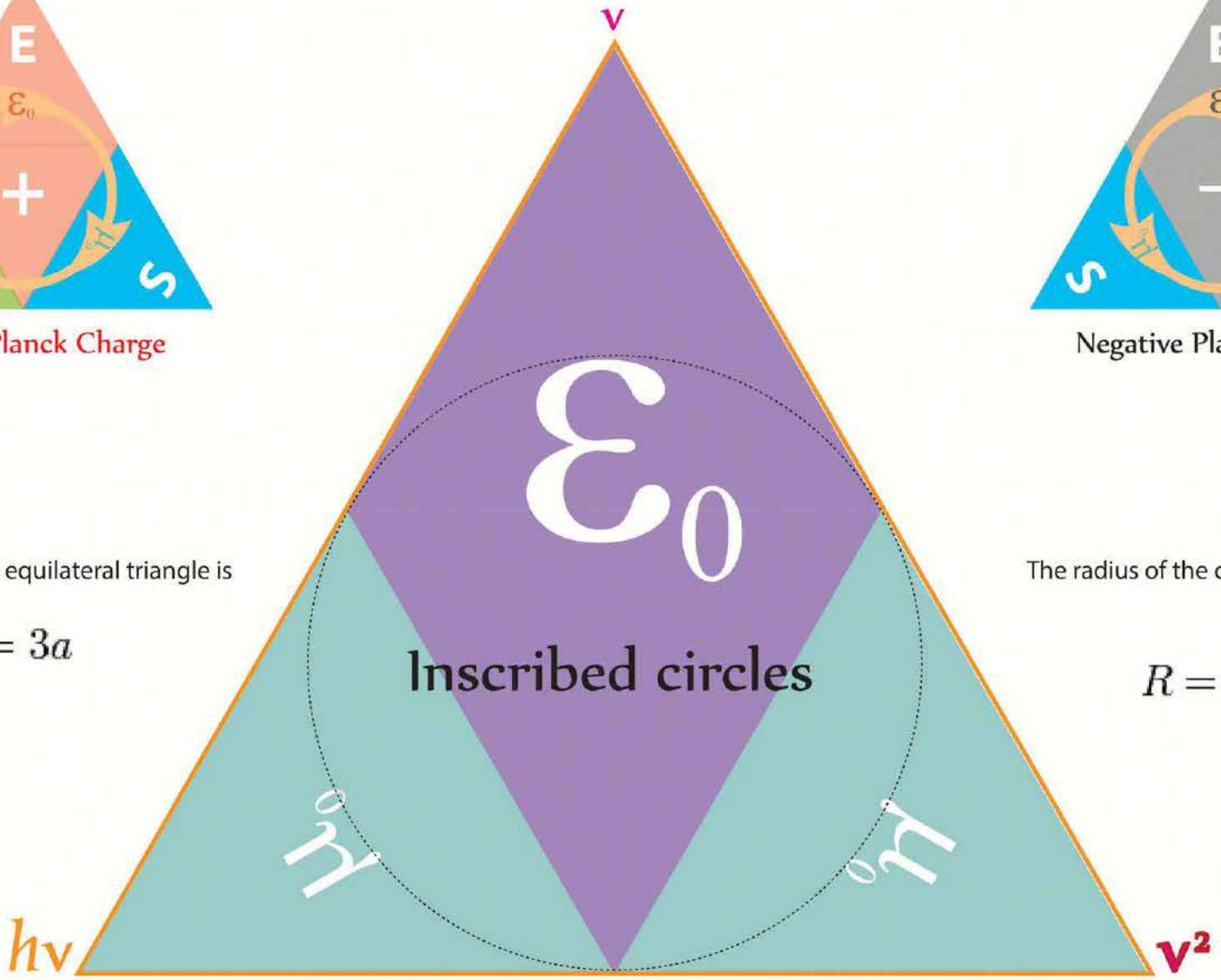
Circumscribed Triangles

reflect Energy's relationship with Time

Positive Planck Charge



Negative Planck Charge



The perimiter of an equilateral triangle is

$$p = 3a$$

The radius of the circumscribed circle is

$$R = \frac{\sqrt{3}}{3}a$$

The equilateral triangle has the smallest area of all those circumscribed around a given circle

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Circumscribed circles

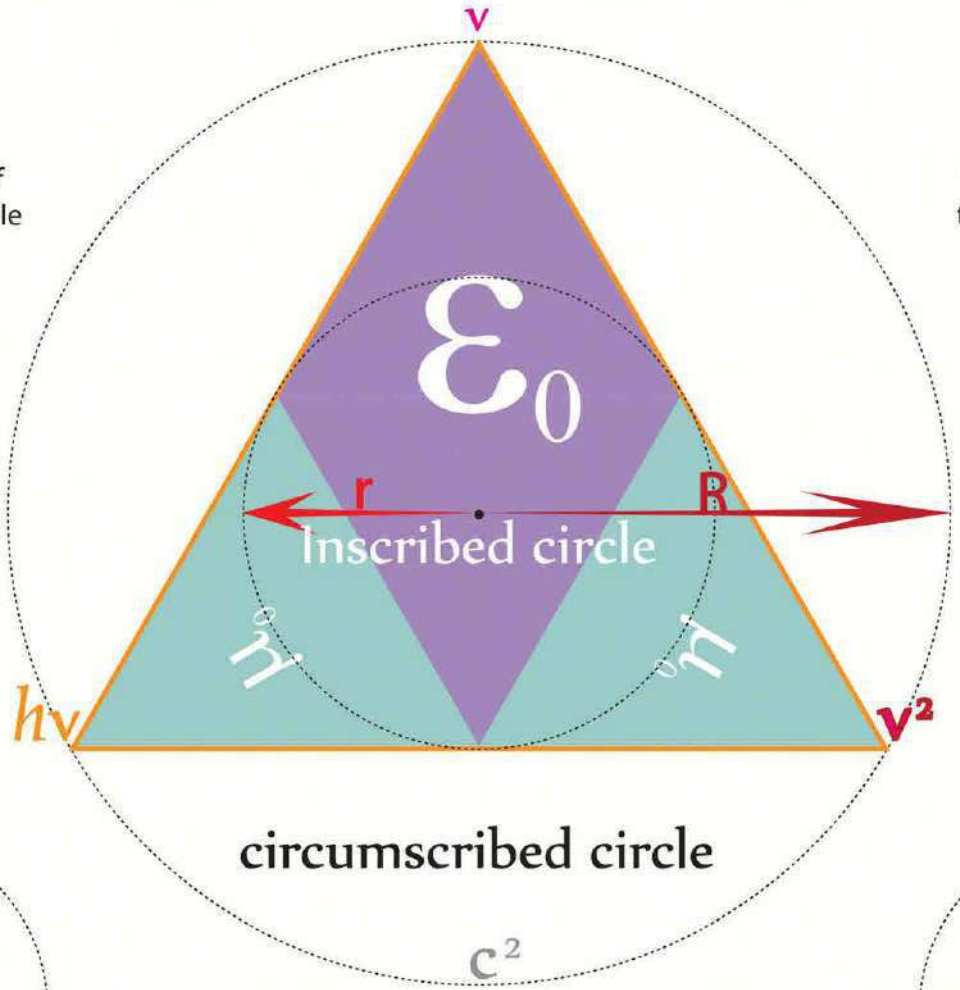
By Euler's inequality, the equilateral triangle has the smallest ratio R/r of the circumradius to the inradius of any triangle: specifically, R/r = 2

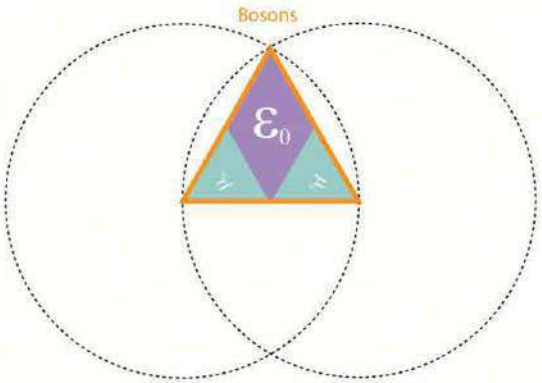
The ratio of the area to the square of the perimeter of an equilateral triangle

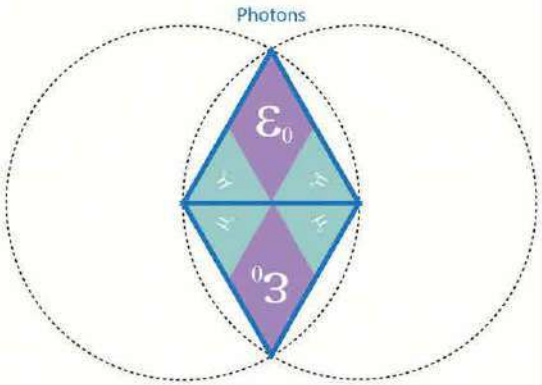
$$\frac{1}{12\sqrt{3}}$$

The ratio of the area of the incircle to the area of an equilateral triangle

$$\frac{\pi}{3\sqrt{3}}$$







Equilateral triangles and Tetrahedrons will scale at exactly the same proportion as Circles and Spheres scribing them

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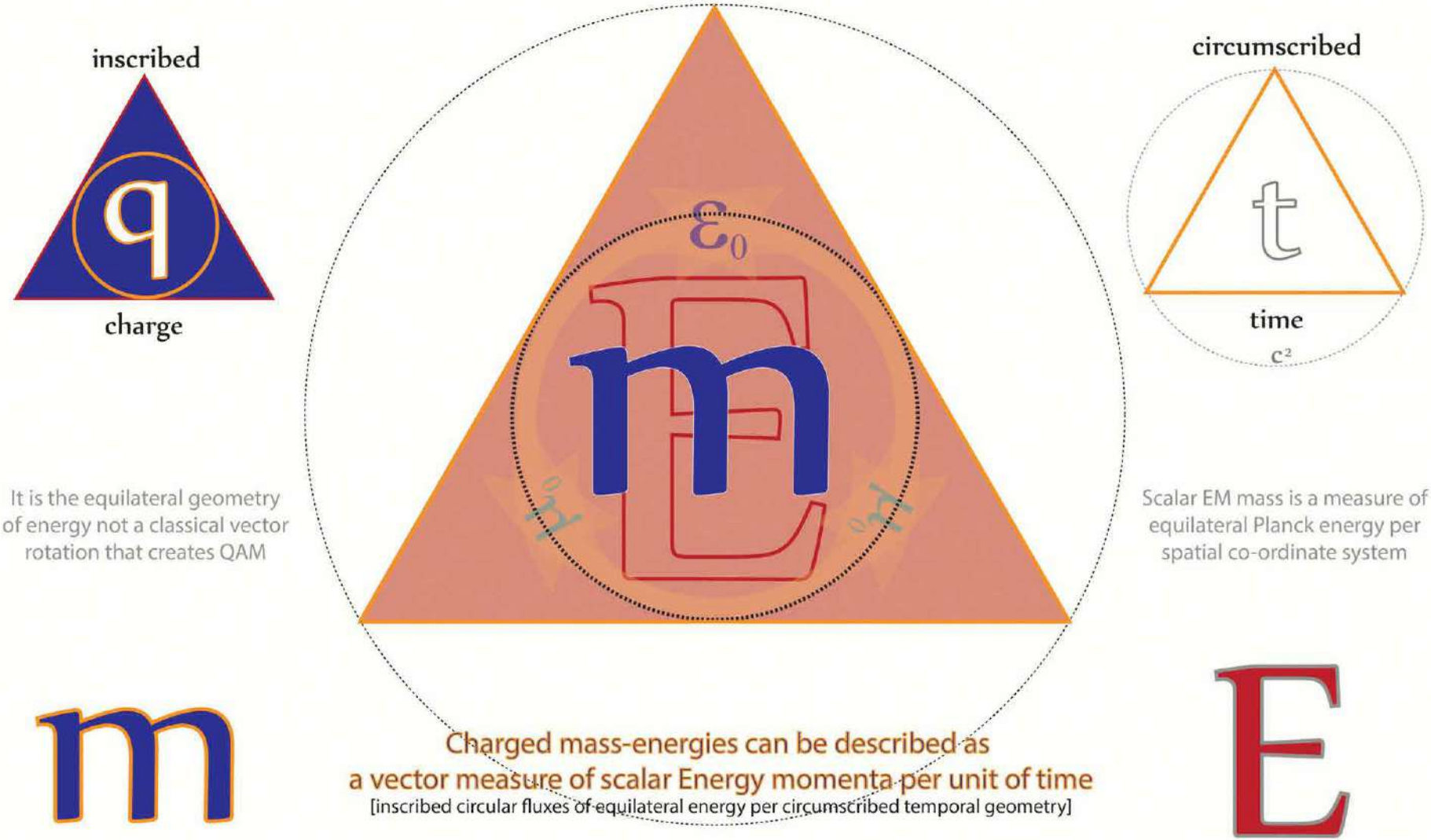
Charged mass-ENERGIES

Charge is the result of quantised angular momenta
[the inscribed circular flux of energy in equilateral geometries]

Time is a measure of changing quantised angular momenta
[the circumscribed spatial co-ordinate of equilateral energy geometries]



Charged mass-energies can be described as a vector measure of scalar Energy momenta per unit of time
[inscribed circular fluxes of equilateral energy per circumscribed temporal geometry]

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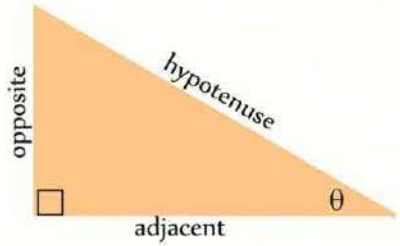
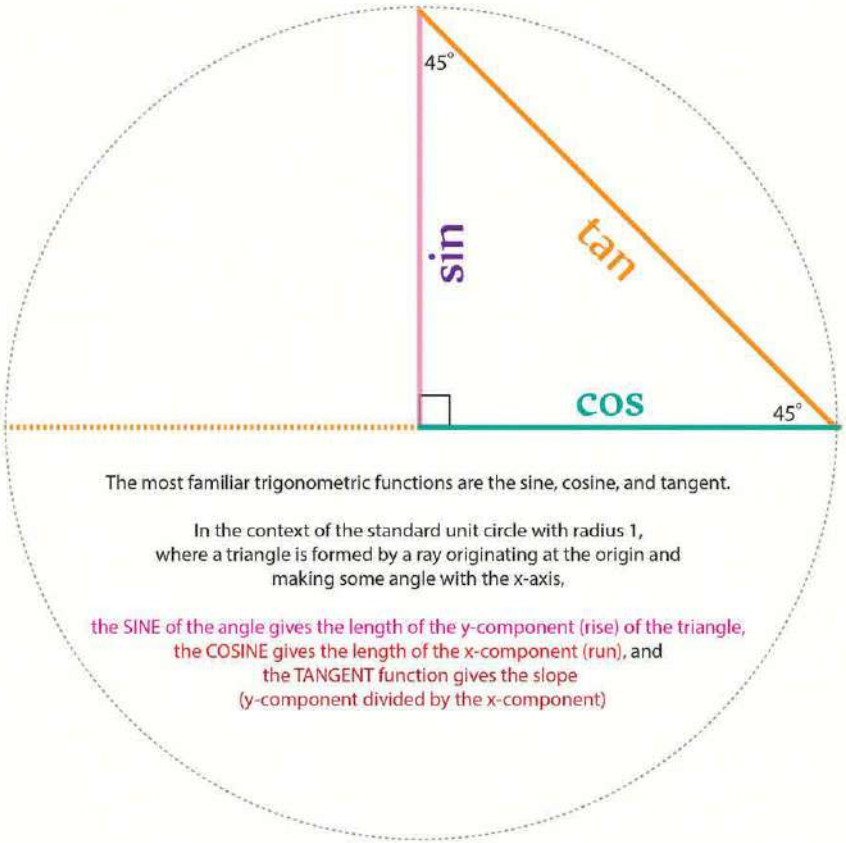
Trigometric functions

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$



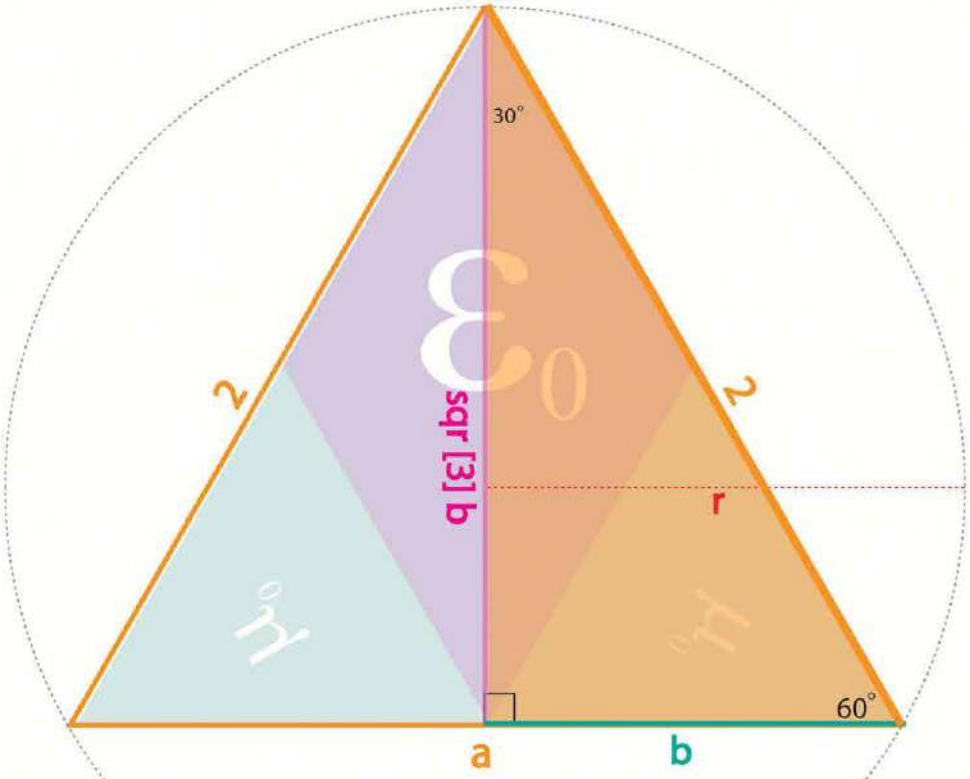


The most familiar trigonometric functions are the sine, cosine, and tangent.

In the context of the standard unit circle with radius 1,
where a triangle is formed by a ray originating at the origin and
making some angle with the x-axis,

the SINE of the angle gives the length of the y-component (rise) of the triangle,
the COSINE gives the length of the x-component (run), and
the TANGENT function gives the slope
(y-component divided by the x-component)

Standard trigometric functions must be carefully applied to measurements of equilateral Planck mass-energy geometries in scribed circular space-time co-ordinate systems



In most cases it is in fact easier to
ignore the trigonomteric functions and math
and simpy draw their related equilateral geometries

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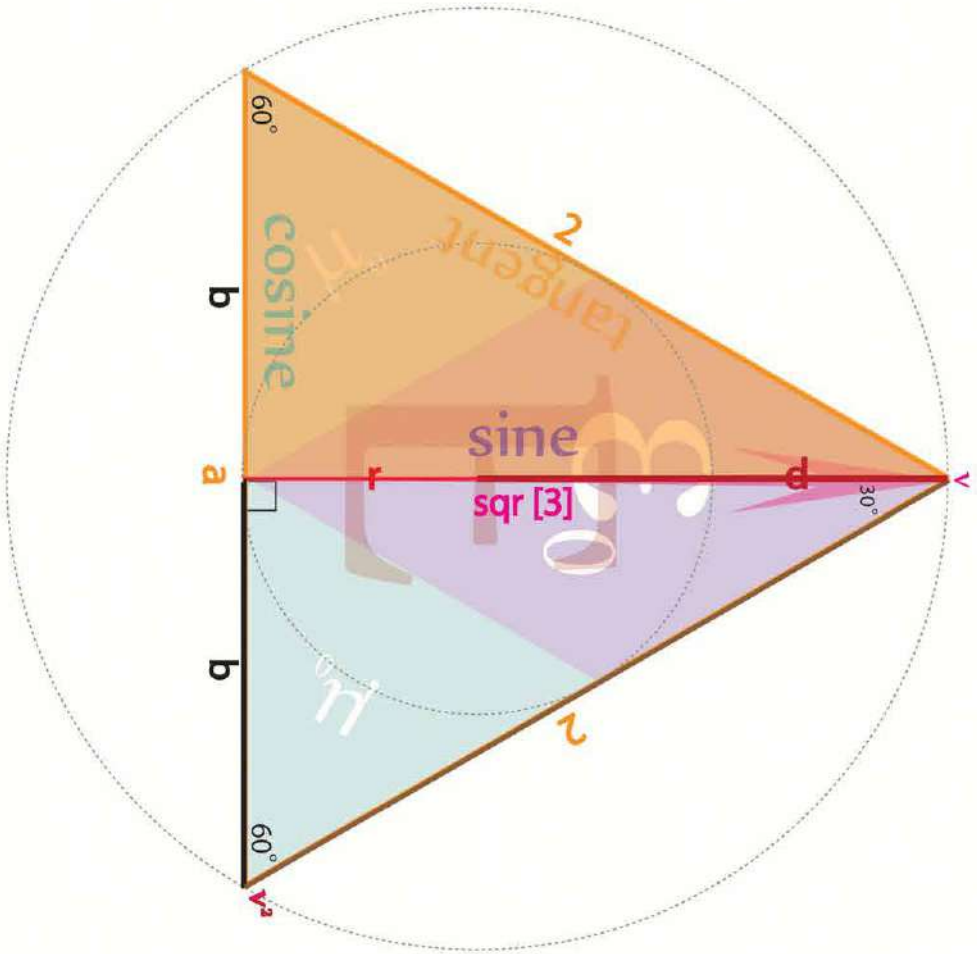
The roots of scribed equilateral triangles

Scalar equilateral energies map directly onto circular space-time co-ordinates
through their square root linear momentum

r

The ratio of the
circumscribed circle of
an equilateral triangle
to its inscribed circle
is 2:1

d



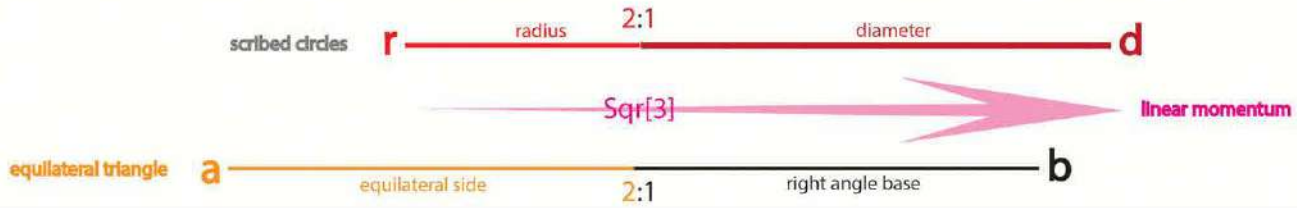
0.866 r

The ratio of the
side of an equilateral triangle
to the radius of
its incribed circle
is sqr [3]/2

a

The ratio of the
side of an equilateral triangle
to the radius of
its circumscribed circle
is sqr [3]

1.732 d



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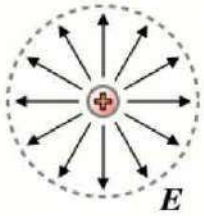
Equilateral triangles and scribed circles

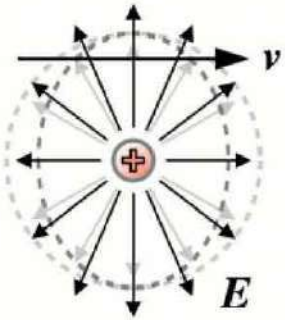
$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}} = \frac{1}{\sqrt{1 - \beta^2}} = \frac{dt}{d\tau}$$

$$\gamma(\beta) = 1 + \frac{1}{2}\beta^2 + \frac{3}{8}\beta^4 + \frac{5}{16}\beta^6 + \frac{35}{128}\beta^8 + \dots$$

$$L = L'\sqrt{1 - \frac{v^2}{c^2}}$$

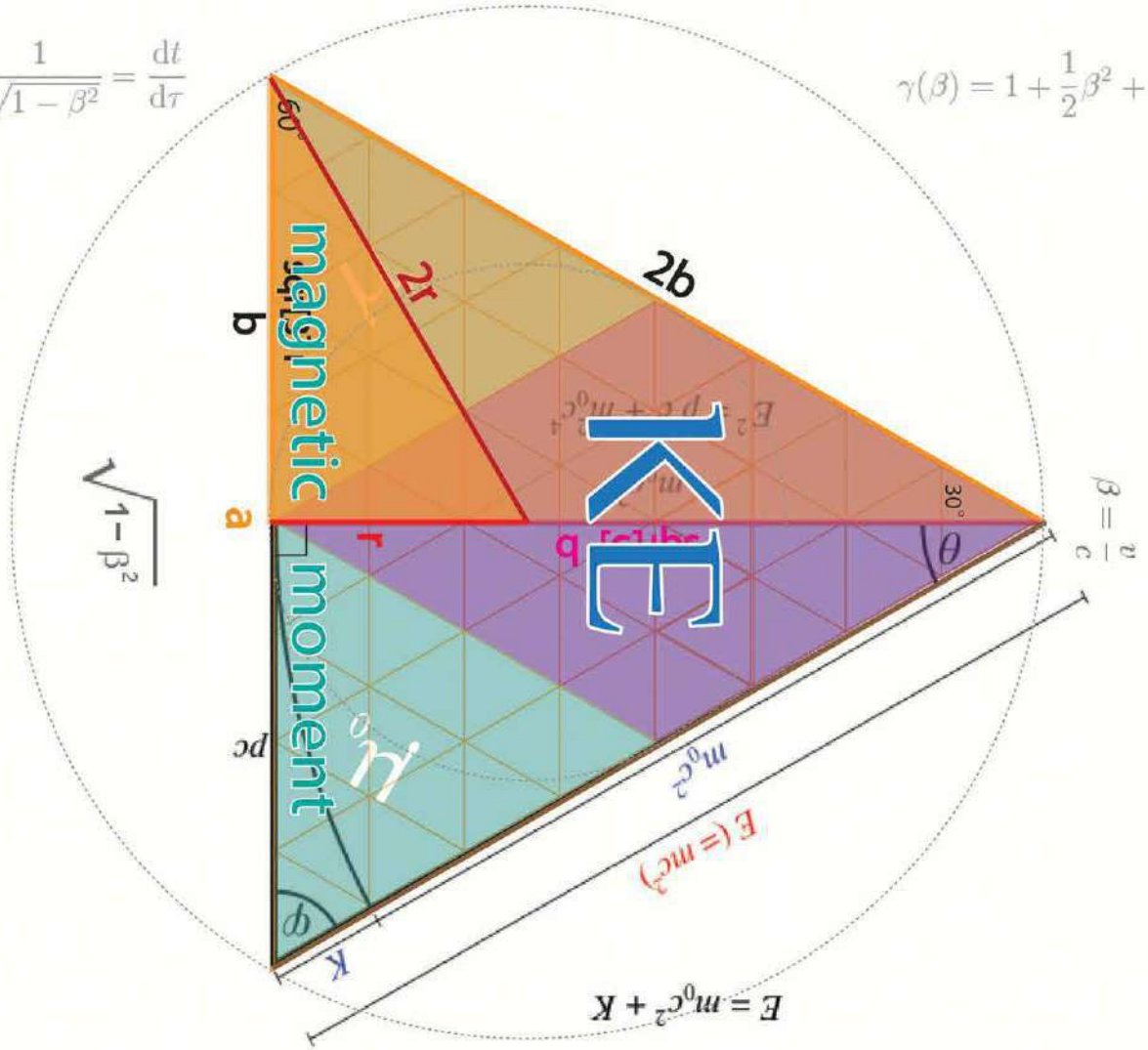
$$E_k = \frac{mc^2}{\sqrt{1 - (v/c)^2}} - mc^2$$





$$mc^2\left\{\frac{1}{\sqrt{1 - v^2/c^2}} - 1\right\}$$

$$p = \frac{m_0 v}{\sqrt{1 - \frac{v^2}{c^2}}} = \gamma m_0 v$$



$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\sqrt{1 - \left(\frac{v}{c}\right)^2}$$

All the relativistic relationships historically attributed to circularised energies and modelled through the use of the math of right angled triangles are in fact the result of equilateral, scalar geometries

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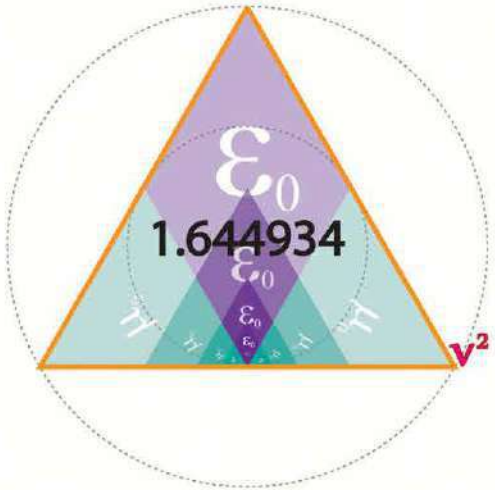
Finite sequences and series have defined first and last terms,

$$\sum a_n = a_0 + a_1 + a_2$$



$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \lim_{n \to +\infty} \left(\frac{1}{1^2} + \frac{1}{2^2} + \cdots + \frac{1}{n^2} \right).$$

whereas infinite sequences and series continue indefinitely

The Basel problem is a famous problem in mathematical analysis with relevance to number theory, first posed by Pietro Mengoli in 1644 and solved by Leonhard Euler in 1735.

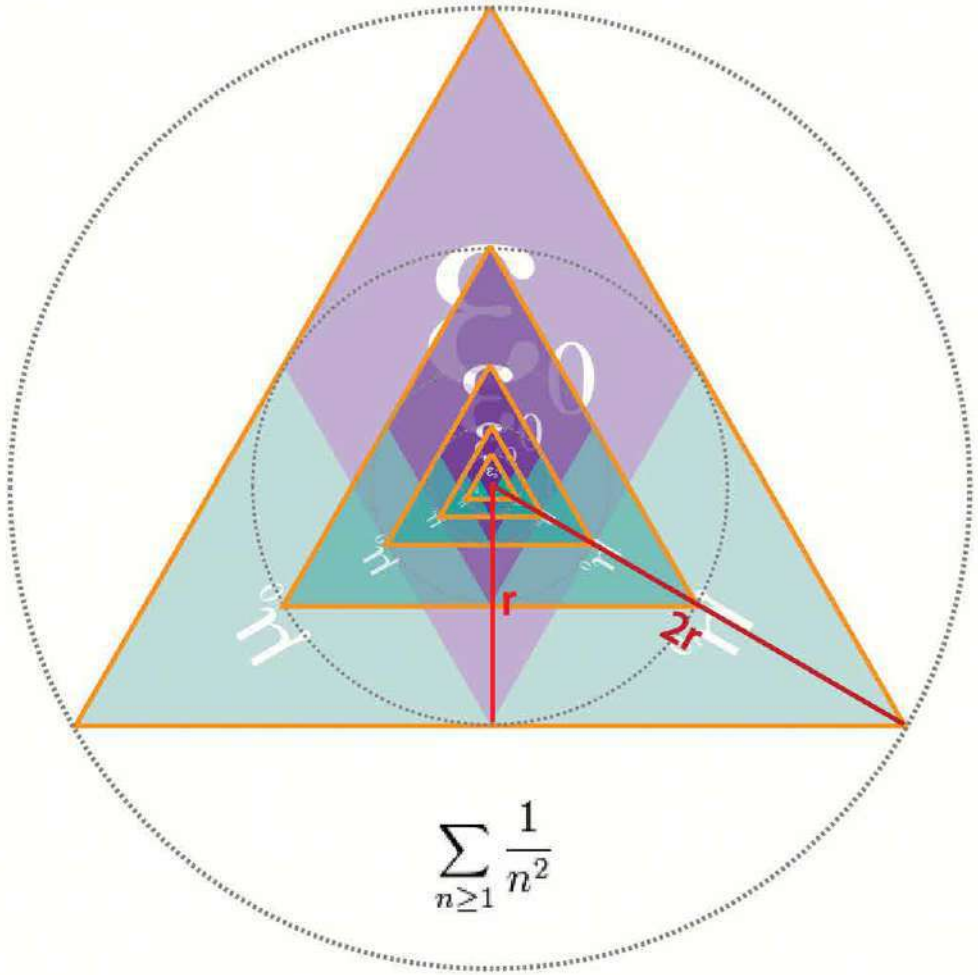
$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{6}$$

Tetryonics now provides a geometric solution to visualising and solving the Basel problem

$$\zeta(2) = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \cdots = \frac{\pi^2}{6} \approx 1.645;$$

Tetryonic Infinite Series

is a infinite sequence of square numbers,
the result of adding all those terms together
[or their geometric inverse]



$$\sum_{n \geq 1} \frac{1}{n^2}$$

The entire sum of the series is equal to
twice the size of the radius of the largest inscribed circle
which is equal to the largest circle circumscribing the triangular series.

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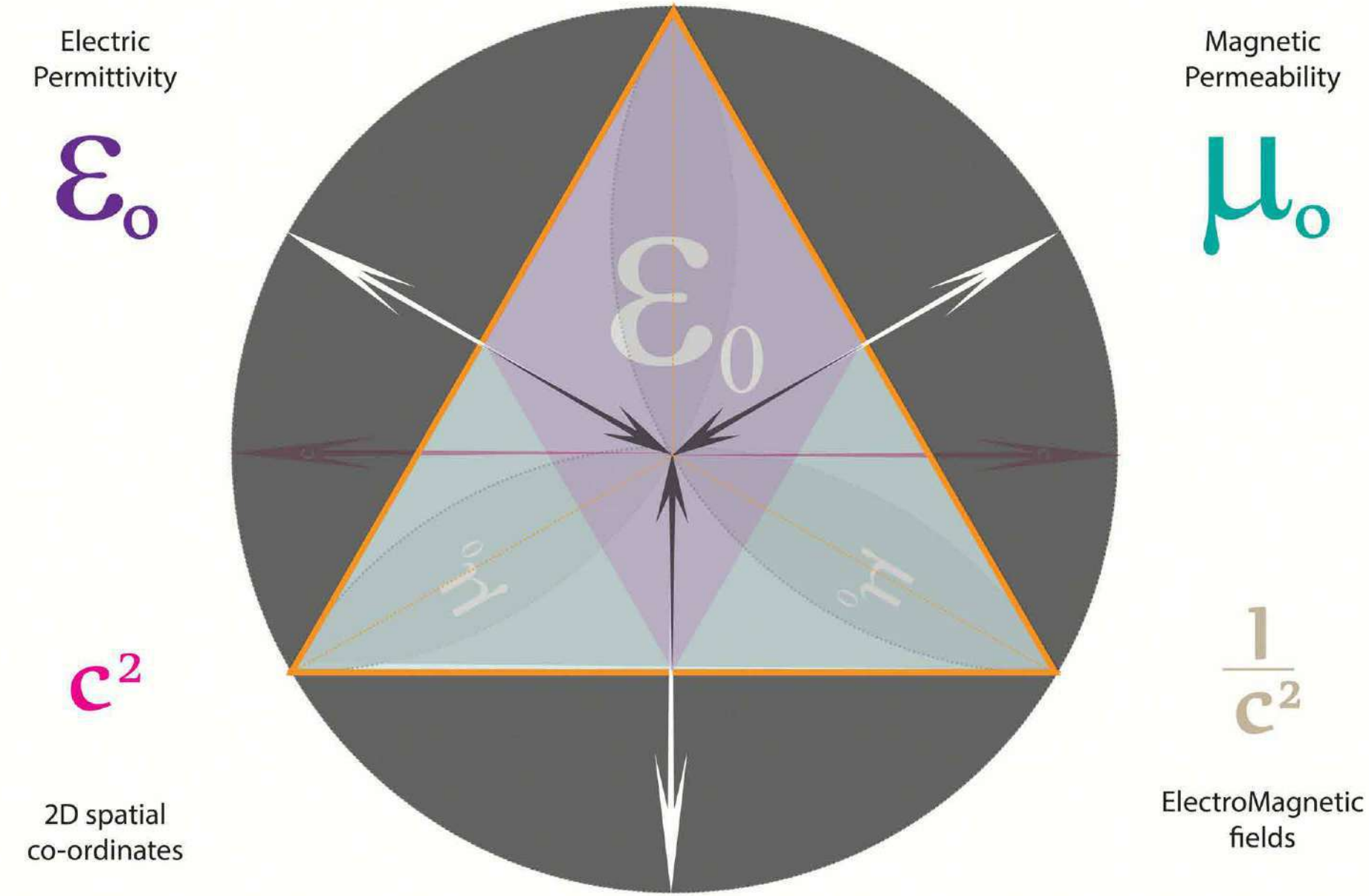
Inverting the Circle



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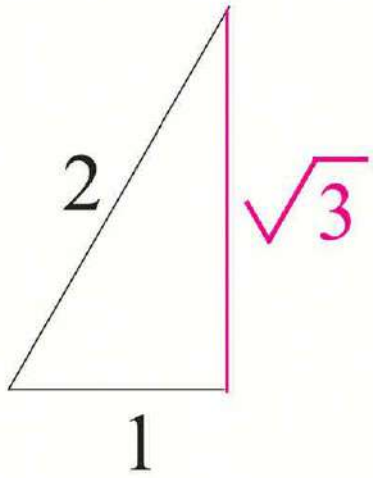
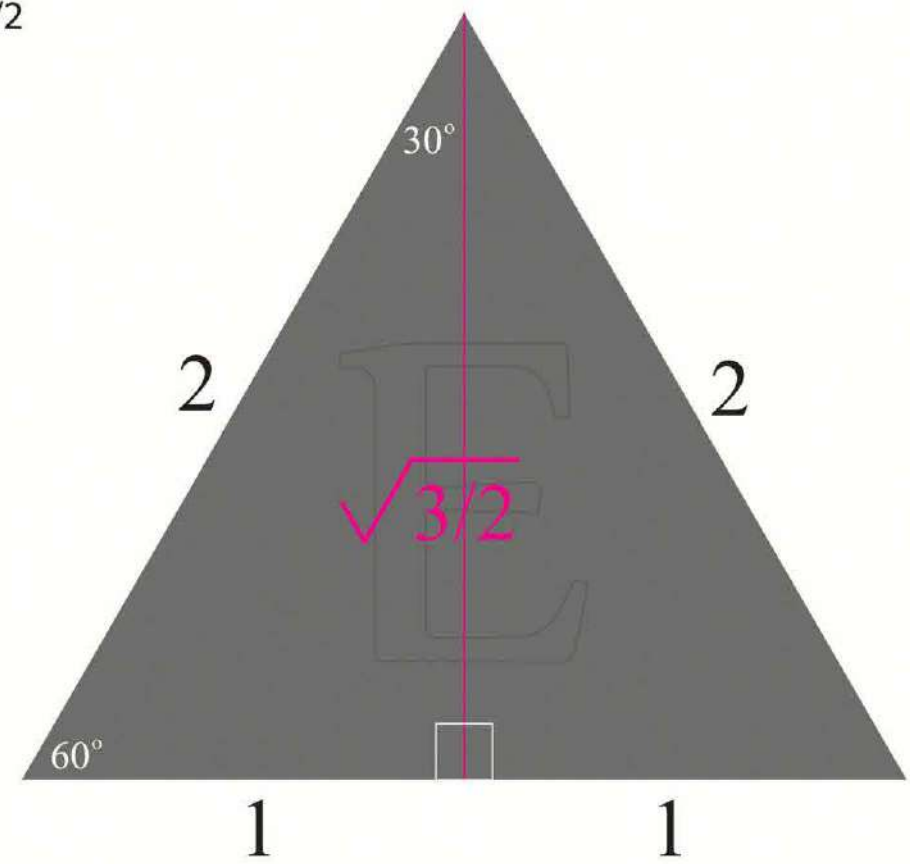
Irrational numbers

an irrational number cannot be represented as a simple fraction.
Irrational numbers are those real numbers that cannot be represented as terminating or repeating decimals

sin(x)=-square root of (3)/2





0.866025403.....

Pythagφras' theoreom
and irratiφnal numbers expressed in terms of right-angled triangles in Physics
offer a 'half truth' regarding the equilateral geometry of Energy

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Leibniz

Leibniz introduced the concept of vis viva (living force) which attempted to quantify life force

$E=mv^2$

Newton

linear momentum

v

Newton focused his work on linear momentum which he developed into his famous laws of motion

Newton and Leibniz disagreed about what the world is made of and how its physics shaped our scientific concepts of force, energy, and momentum

Tetryonics reveals the physical relationships they both described mathematically as geometric properties of equilateral Planck energy momenta

$p=mv$

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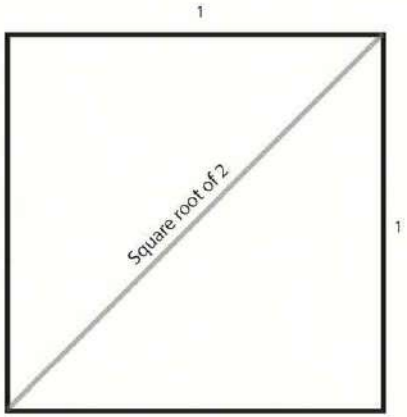
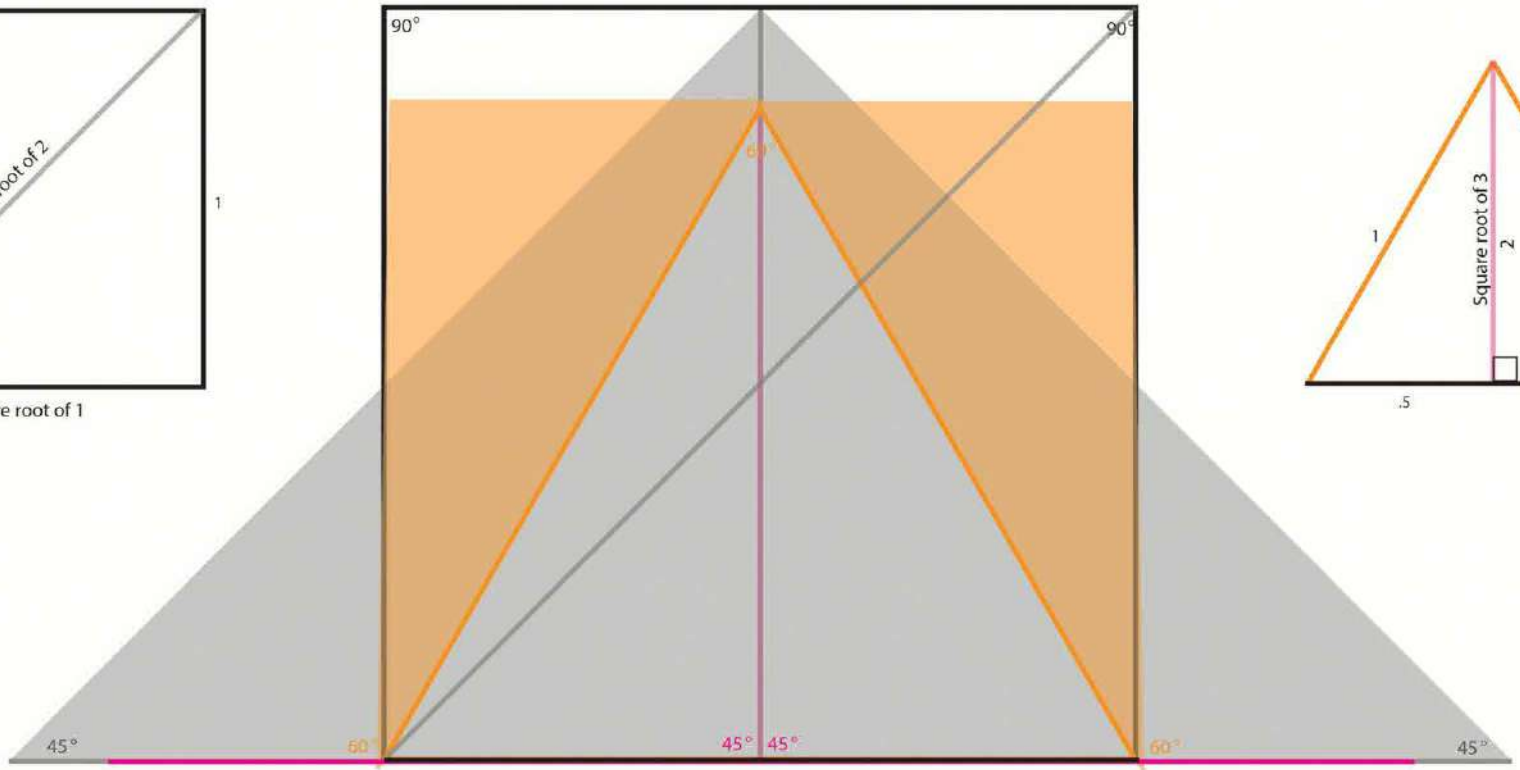
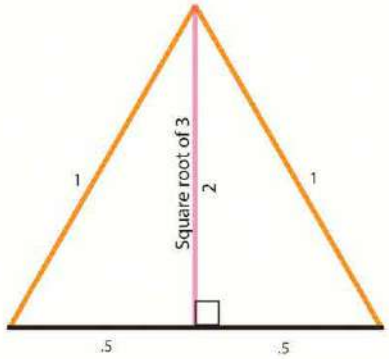
Geometric Square Roots

In geometrical terms, the square root function maps the area of a square to its side length.



Square root of 1





"In mathematics, as in any scientific research, we find two tendencies present. On the one hand, the tendency toward abstraction seeks to crystallize the logical relations inherent in the maze of material that is being studied, and to correlate the material in a systematic and orderly manner. On the other hand, the tendency toward intuitive understanding fosters a more immediate grasp of the objects one studies, a live rapport with them, so to speak, which stresses the concrete meaning of their relations"

Square root of 1

Square root of 2

Square root of 3

"As to geometry, in particular, the abstract tendency has here led to the magnificent systematic theories of Algebraic Geometry, of Riemannian Geometry, and of Topology; these theories make extensive use of abstract reasoning and symbolic calculation in the sense of algebra.

Notwithstanding this, it is still as true today as it ever was that intuitive understanding plays a major role in geometry. And such concrete intuition is of great value not only for the research worker, but also for anyone who wishes to study and appreciate the results of research in geometry"

David Hilbert [Geometry and the Imagination]

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Square Roots in Physics

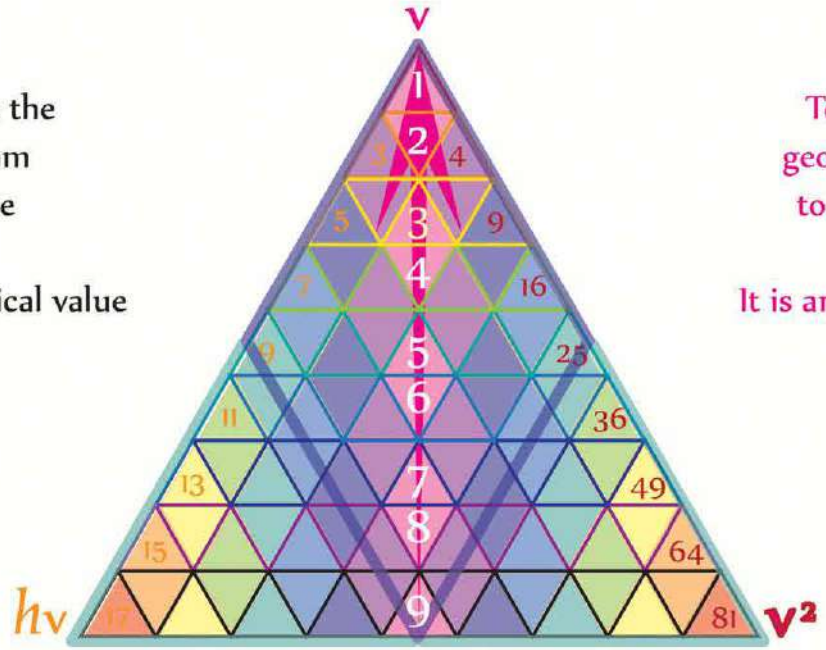
In mathematics, a square root of a number a is a number [n] such that [n]2 = x,
or, in other words, a number [n] whose square (the result of multiplying the number by itself, or [n × n]) is x.

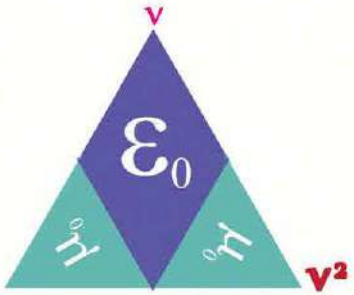
Modern calculators use the
Square Root Algorithm
to calculate the value

It is an approximate numerical value

Tetryonics uses the
geometric Square Root
to calculate the value

It is an exact geometric value

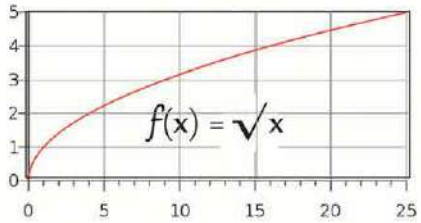




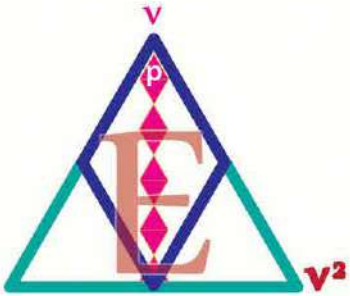
$$E = mv^2$$

In classical geometry,
the square root function maps the
area of a square to its side length.

$$p = \sqrt{E}$$



Geometry can easily map irrational numbers



$$p^2 = E$$

In physics,
the square root function maps
ENERGY [E] to momentum [mv]

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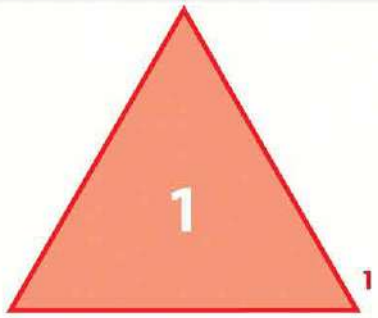
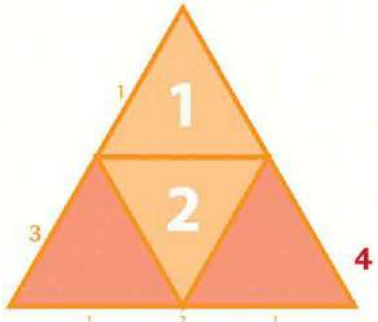
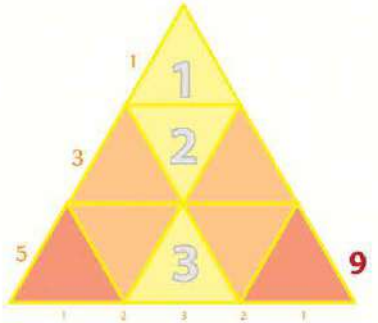
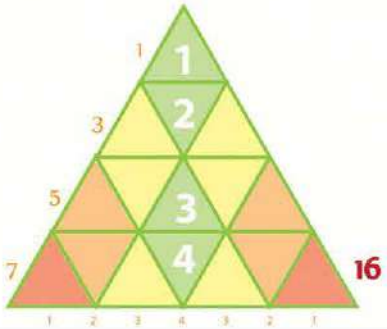
The Square roots of n

Historically, any number raised to the power of 2 has been modeled using a polygon--the square
That's why we call raising a number to the second power "squaring the number."



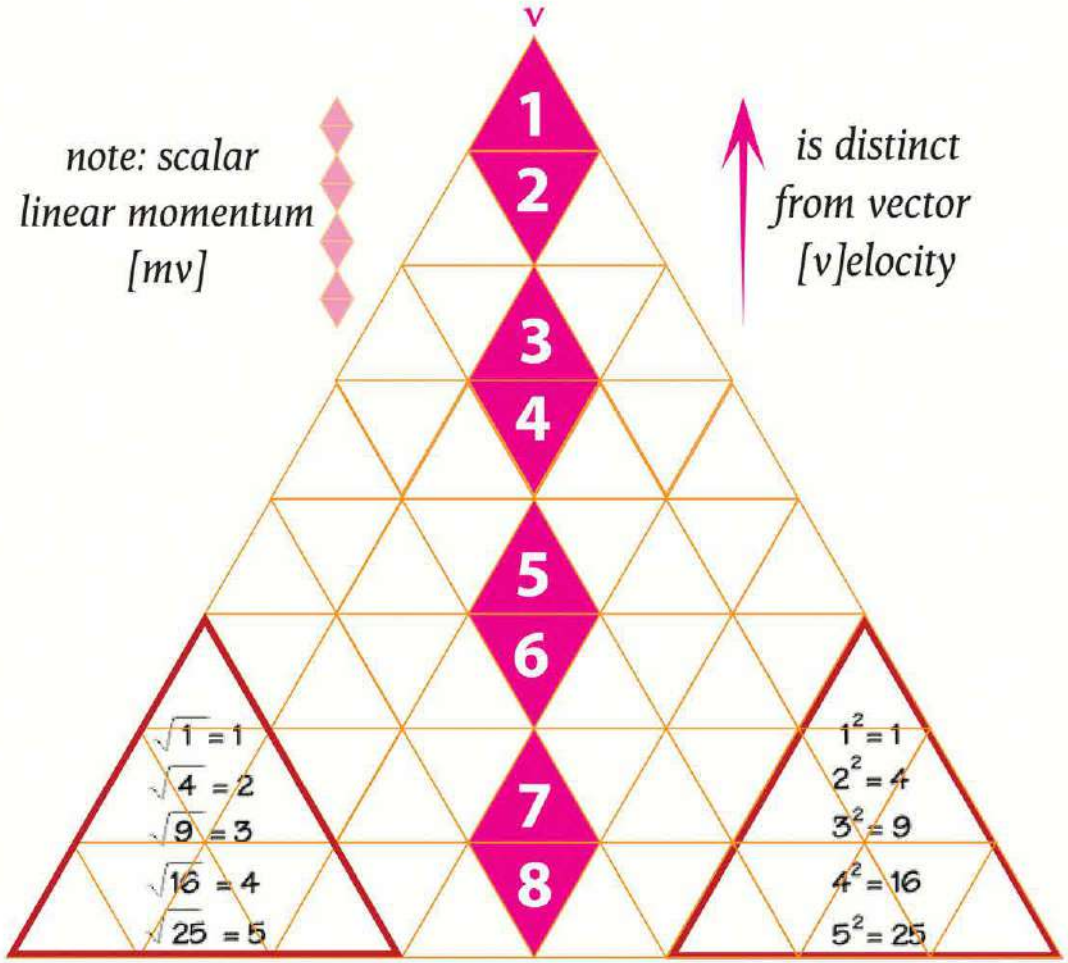




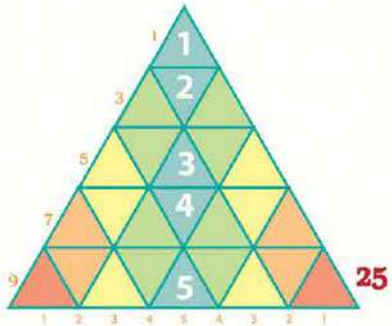


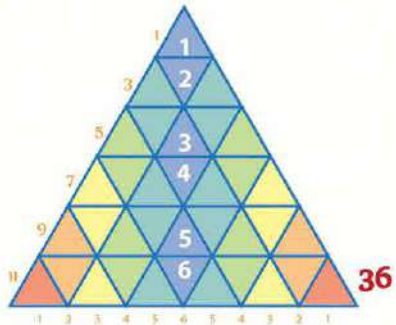
note: scalar linear momentum [mv]

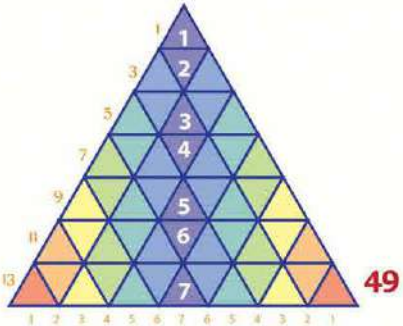
is distinct from vector [v]elocity

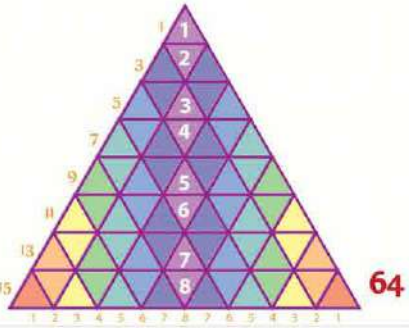


[In physics square numbers are in fact equilateral geometries]
The perfect squares are squares of whole numbers.
Here are the first eight perfect squares









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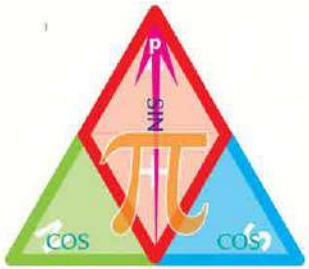
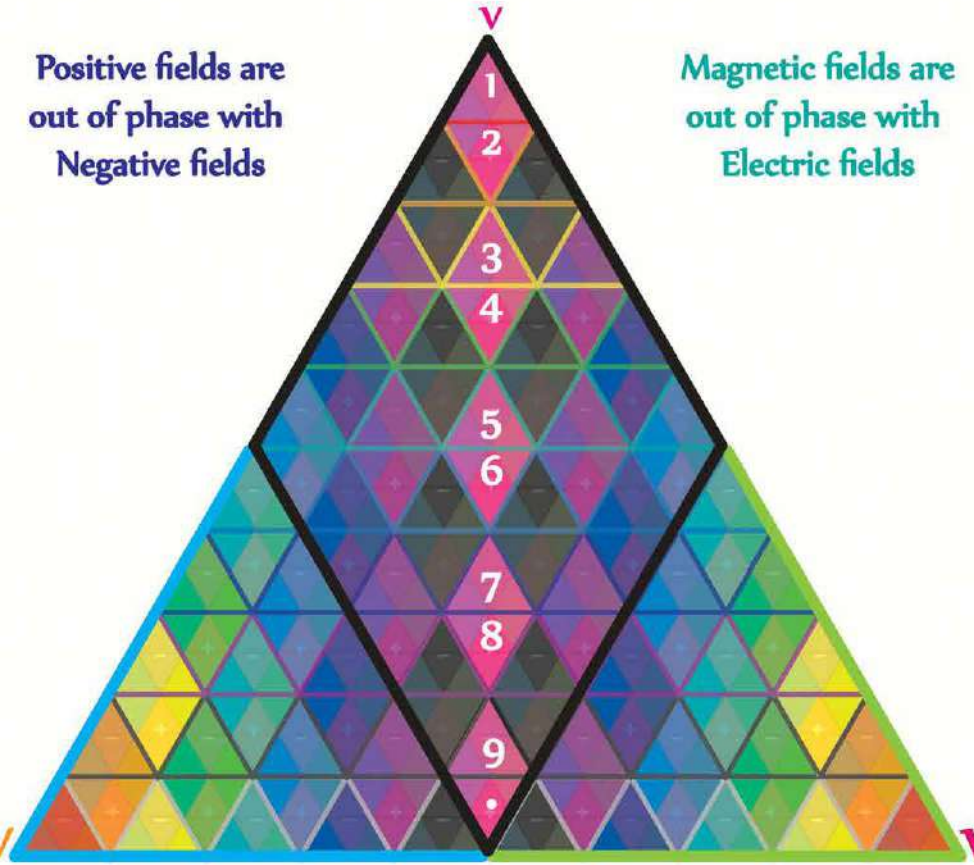
The Square root of Negative 1



Positive fields are out of phase with Negative fields



Magnetic fields are out of phase with Electric fields

Euler's Formula

Euler's formula is often considered to be the basis of the complex number system. In deriving this formula, Euler established a relationship between the trigonometric functions, sine and cosine, and e raised to a power

$$e^{ix} = \cos(x) + i\sin(x)$$

a mathematical description of EM-Energy waveforms

Leonhard Euler

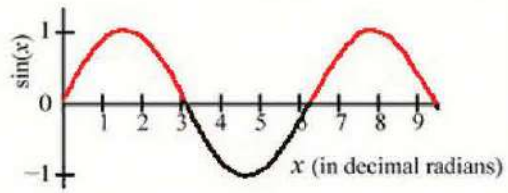
(15 April 1707 – 18 September 1783)

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots$$

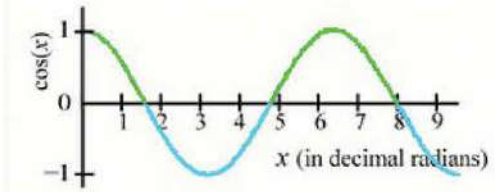
$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots$$

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$

$$\sin x + \cos x = 1 + x - \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$



$$e^{i\pi} = -1 \qquad e^{i\pi} + 1 = 0$$



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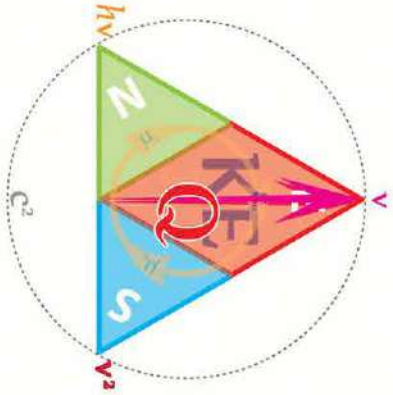
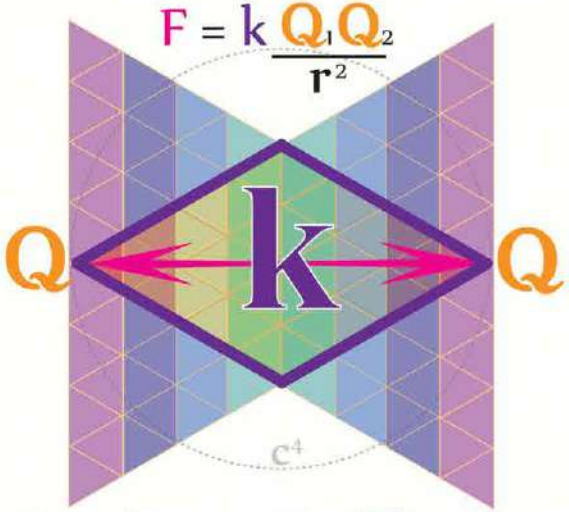
Geometric means

The geometric mean of two numbers, is the square root of their product

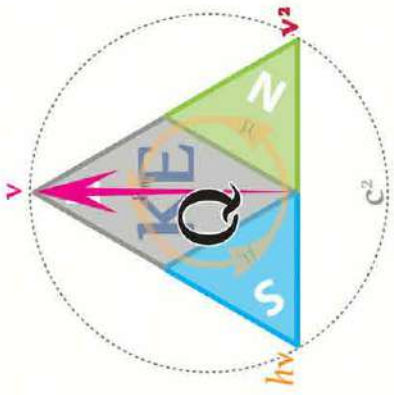
geometric square root of positive one



$$F = k \frac{Q_1 Q_2}{r^2}$$

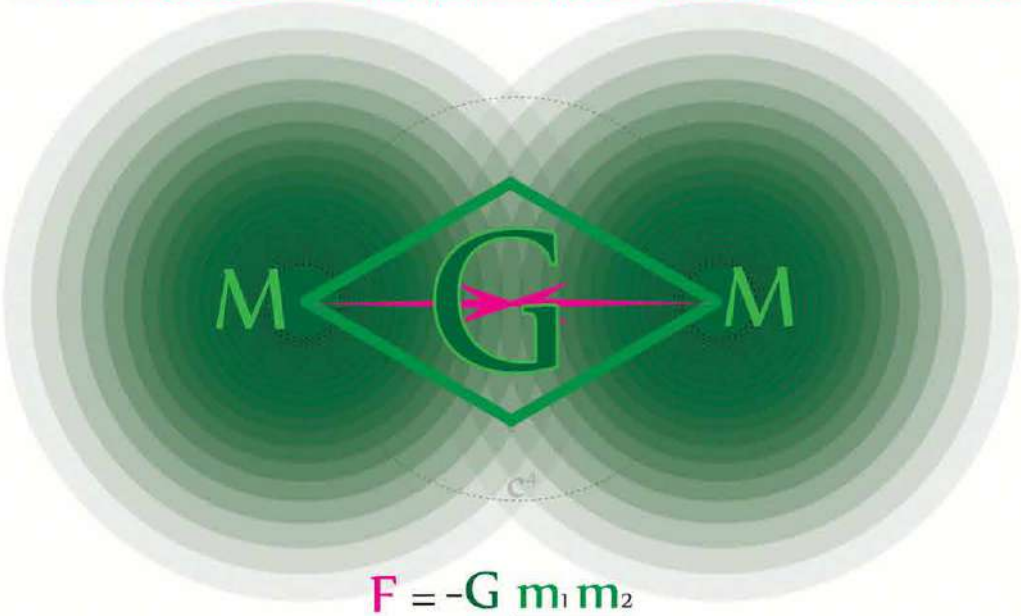


geometric square root of negative one



In physics, the geometric mean of two superpositioned fields produces a vector square root Force

It is generally stated that the geometric mean applies only to positive numbers.



$$F = -G \frac{m_1 m_2}{r^2}$$

In Tetryonic geometry the geometric mean applies to positive & negative fields.

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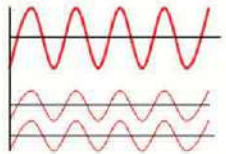
Superpositioning

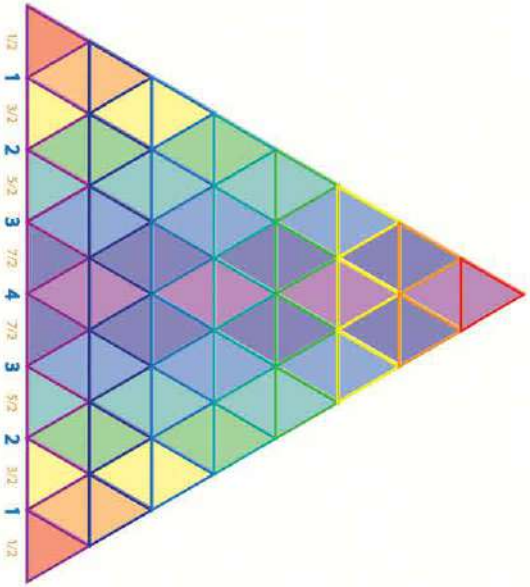
When two or more waves traverse the same space,
the net amplitude at each point is the
sum of the amplitudes of the individual waves.

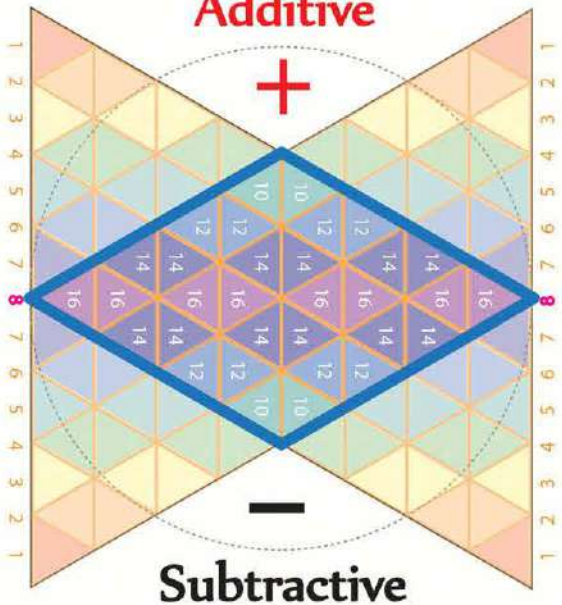


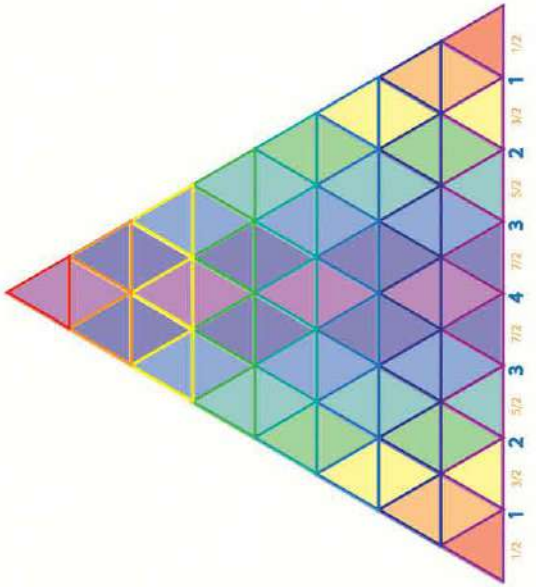
constructive interference

In phase

Additive

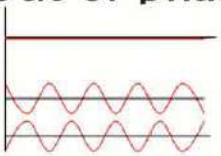






Subtractive

Out of phase



destructive interference

When two or more waves traverse the same space,
if the summed variation has a smaller amplitude
than the constiuent component variations.

The lines of Force

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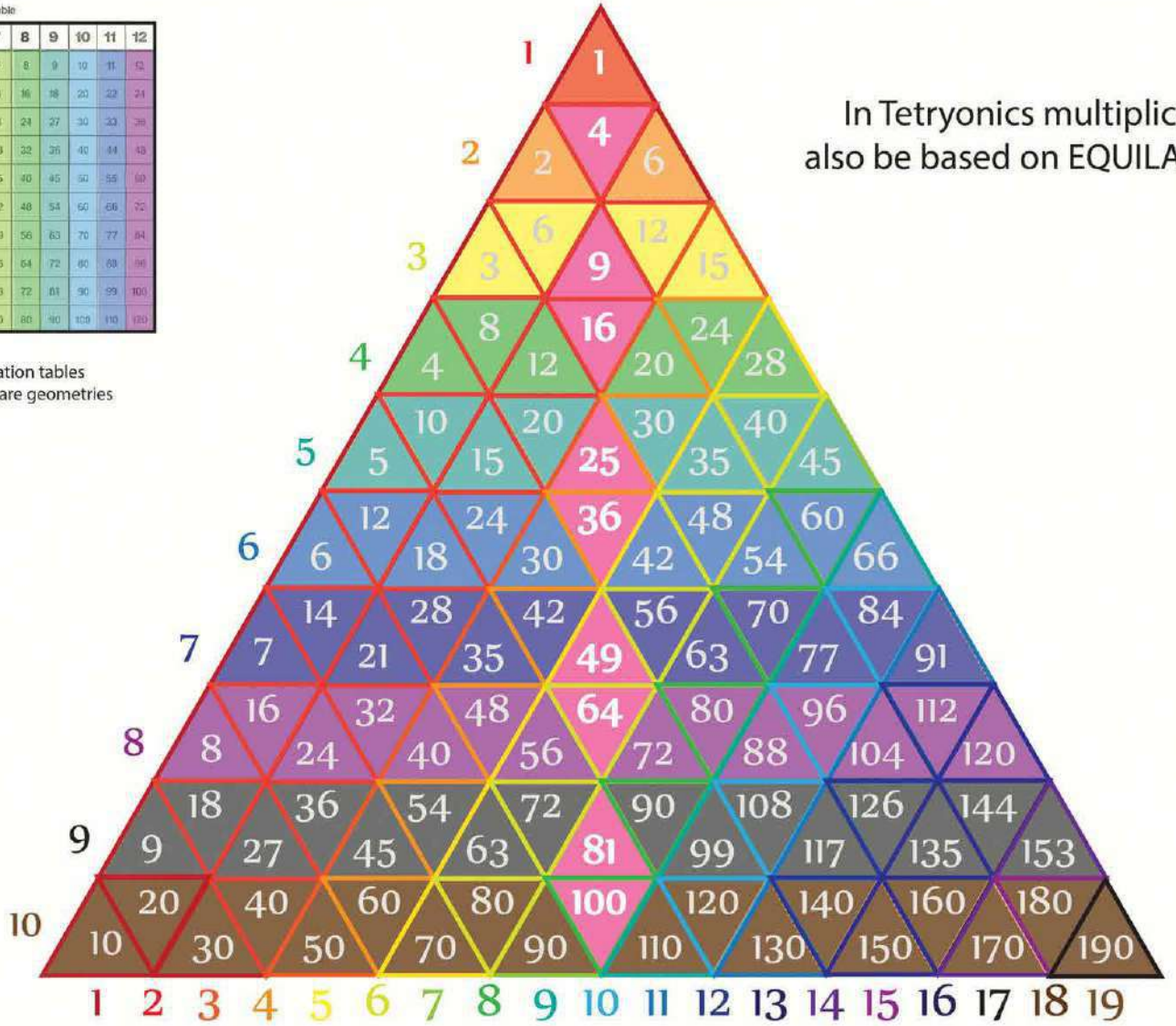
Tetryonic Multiplication table

A multiplication table is a mathematical grid used to define a multiplication operation and its results

Multiplication Table

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120

Historically Multiplication tables have been based on Square geometries



In Tetryonics multiplication tables can also be based on EQUILATERAL geometries

The integer multiplicitors are colour coded

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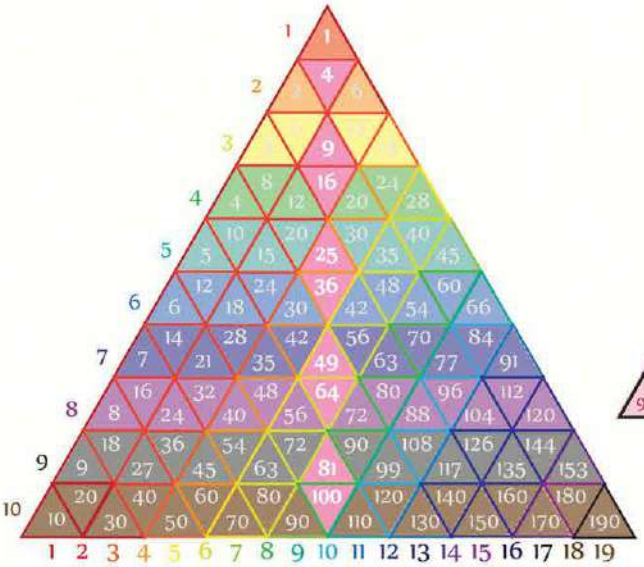
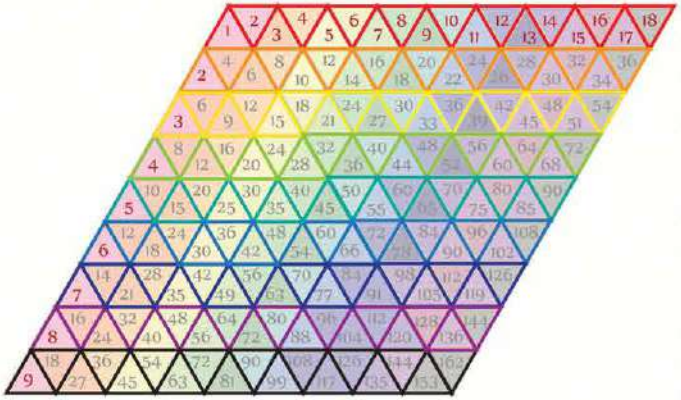
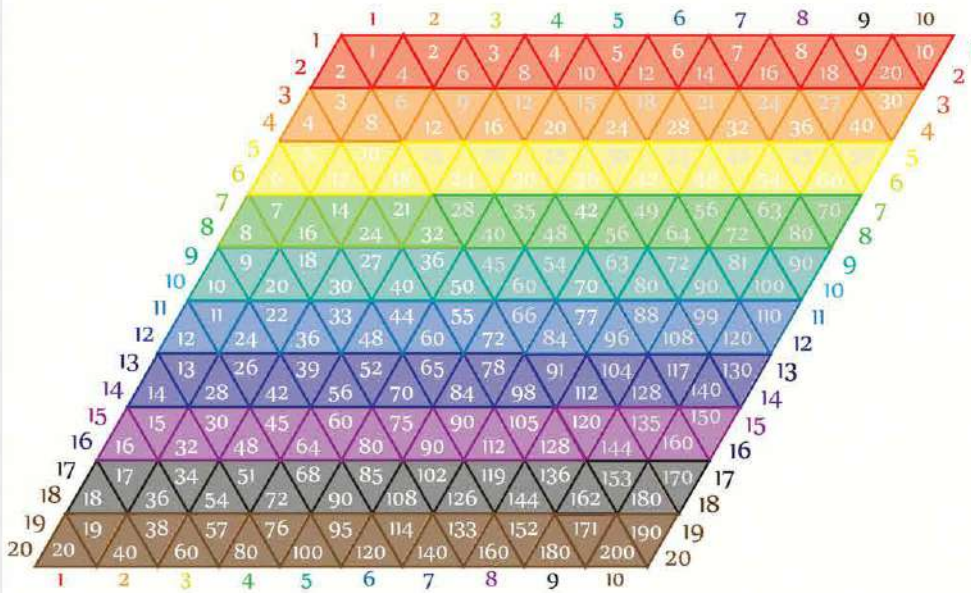
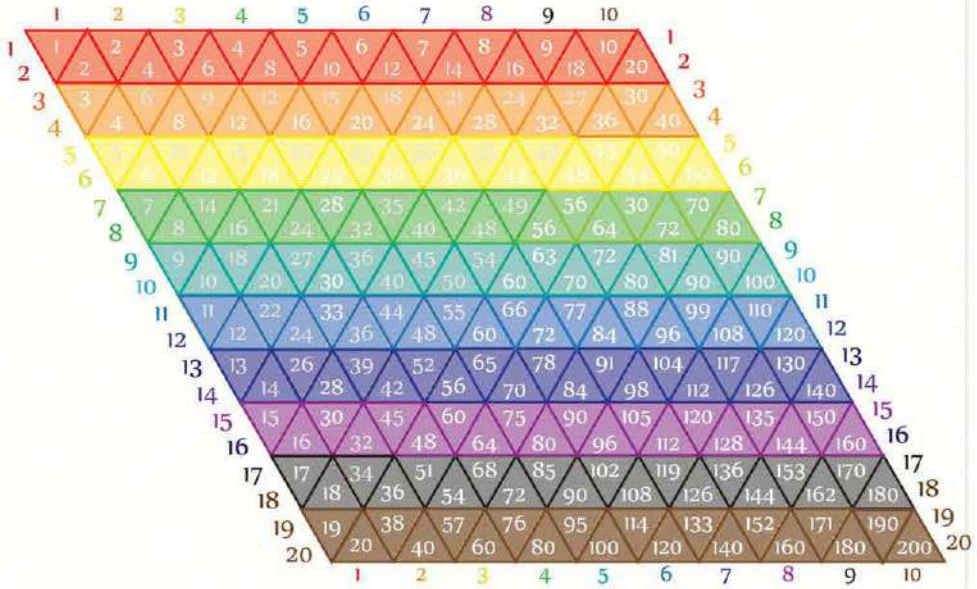
Rhombic Multiplication Tables

1	2	3	4	5	6	7	8	9	10
2	**4**	6	8	10	12	14	16	18	20
3	6	**9**	12	15	18	21	24	27	30
4	8	12	**16**	20	24	28	32	36	40
5	10	15	20	**25**	30	35	40	45	50
6	12	18	24	30	**36**	42	48	54	60
7	14	21	28	35	42	**49**	56	63	70
8	16	24	32	40	48	56	**64**	72	80
9	18	27	36	45	54	63	72	**81**	90
10	20	30	40	50	60	70	80	90	**100**









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Photonic Root Tables

Tetryonic multiplication table can take a number of geometric forms

Square root median

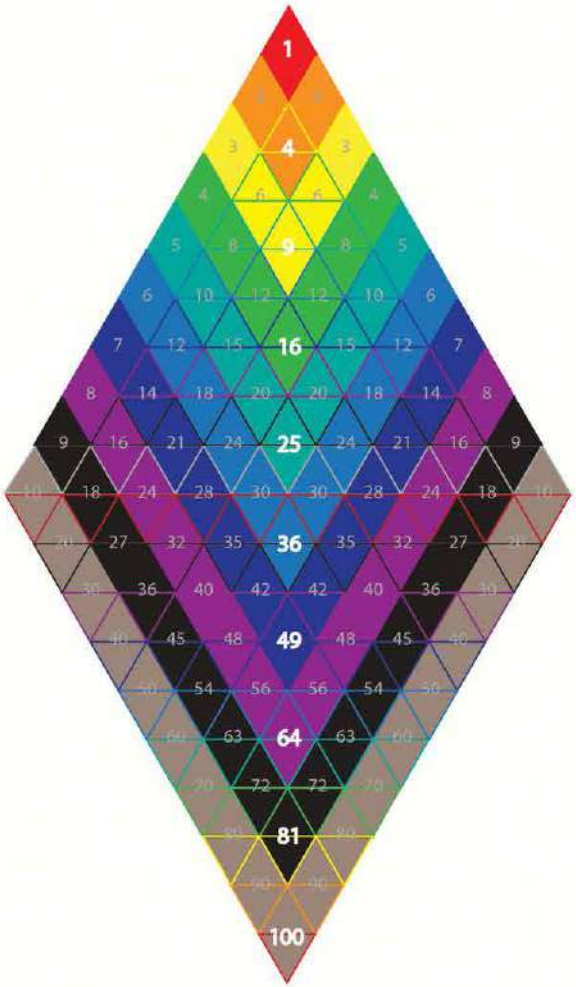
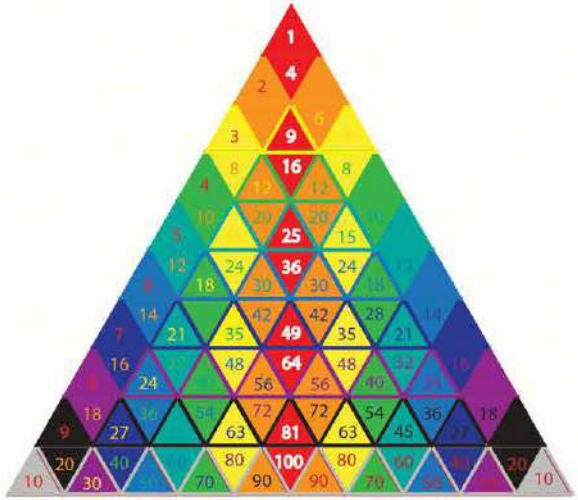


Table read diagonally



1	2	3	4	5	6	7	8	9	10
2	**4**	6	8	10	12	14	16	18	20
3	6	**9**	12	15	18	21	24	27	30
4	8	12	**16**	20	24	28	32	36	40
5	10	15	20	**25**	30	35	40	45	50
6	12	18	24	30	**36**	42	48	54	60
7	14	21	28	35	42	**49**	56	63	70
8	16	24	32	40	48	56	**64**	72	80
9	18	27	36	45	54	63	72	**81**	90
10	20	30	40	50	60	70	80	90	**100**

Integer median

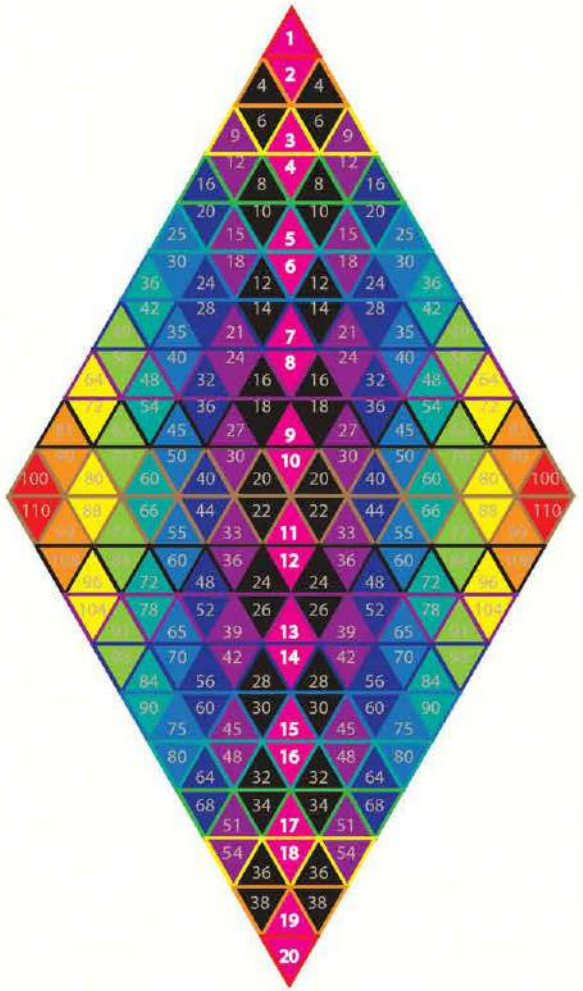


Table read from centre
to outside edge then down

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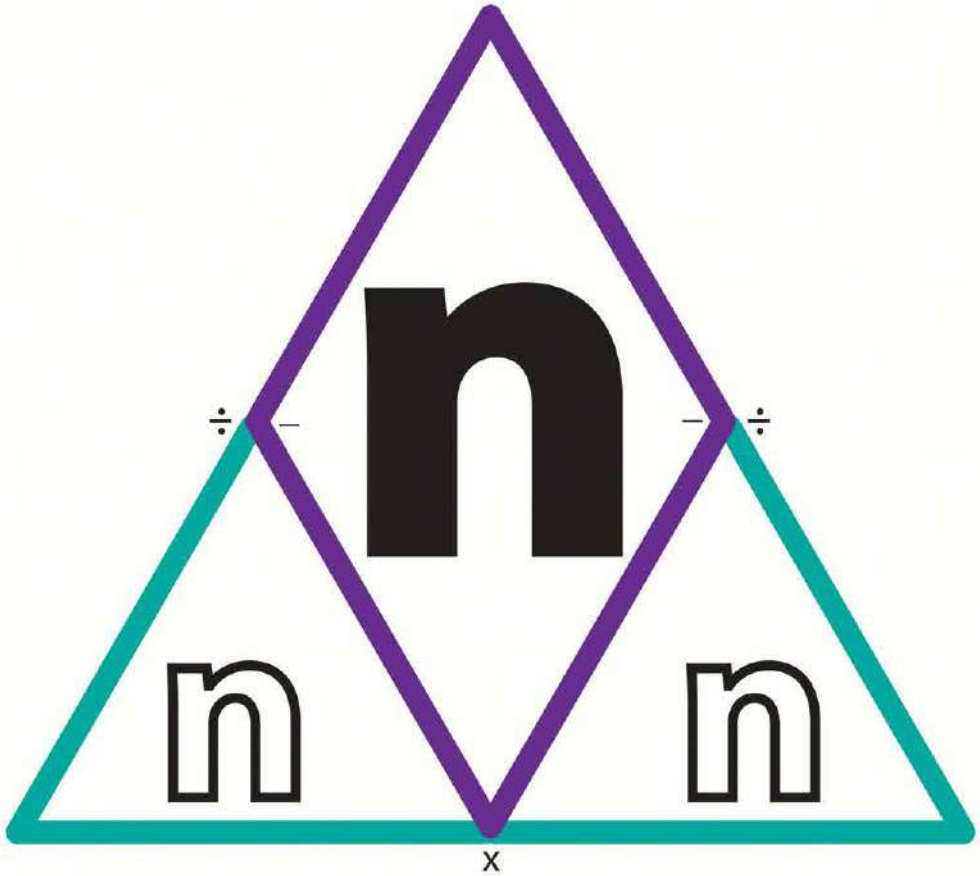
Divide [division] tables

Minus [subtraction] tables



Times [multiplication] tables

Plus [addition] tables

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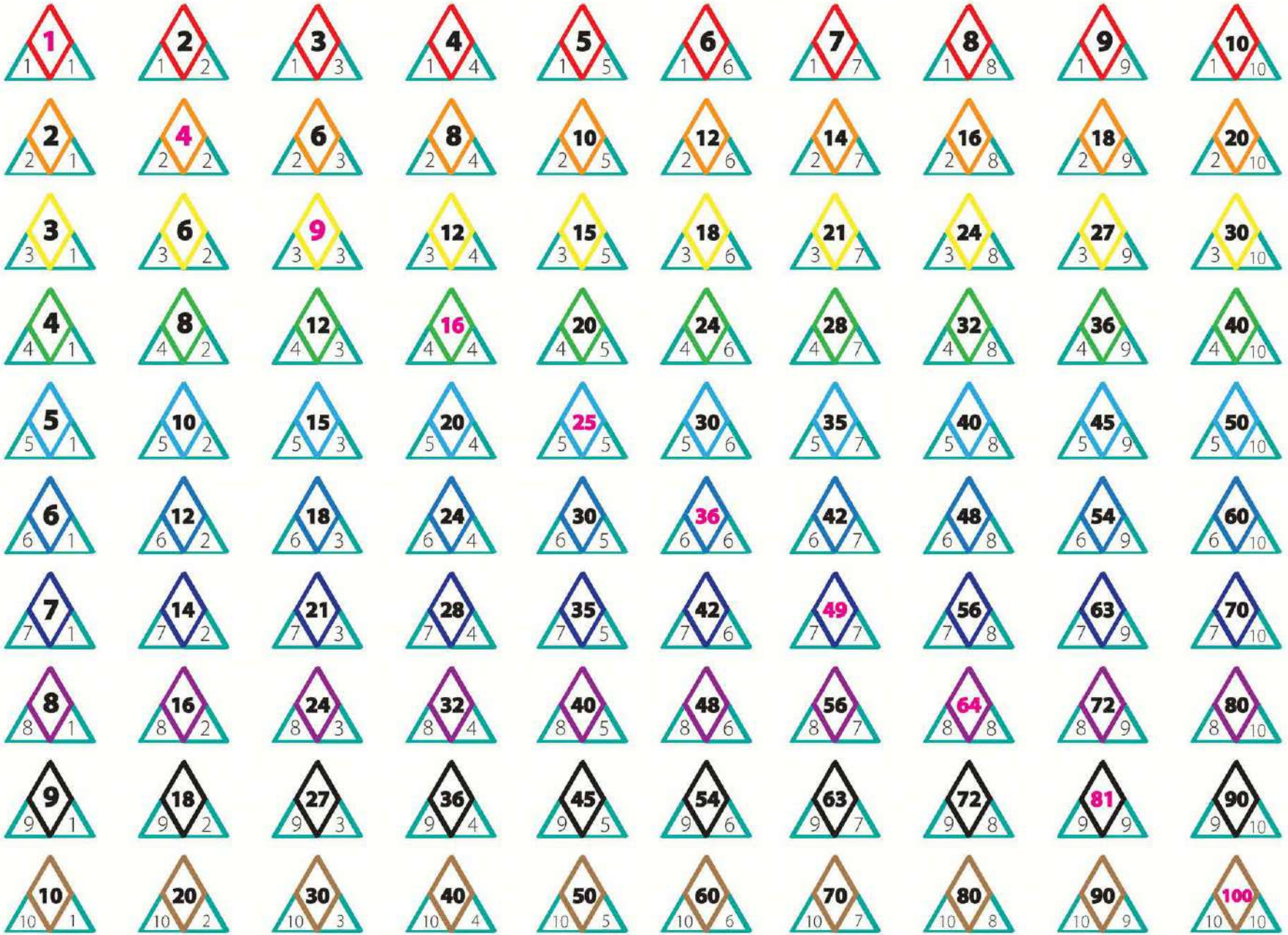

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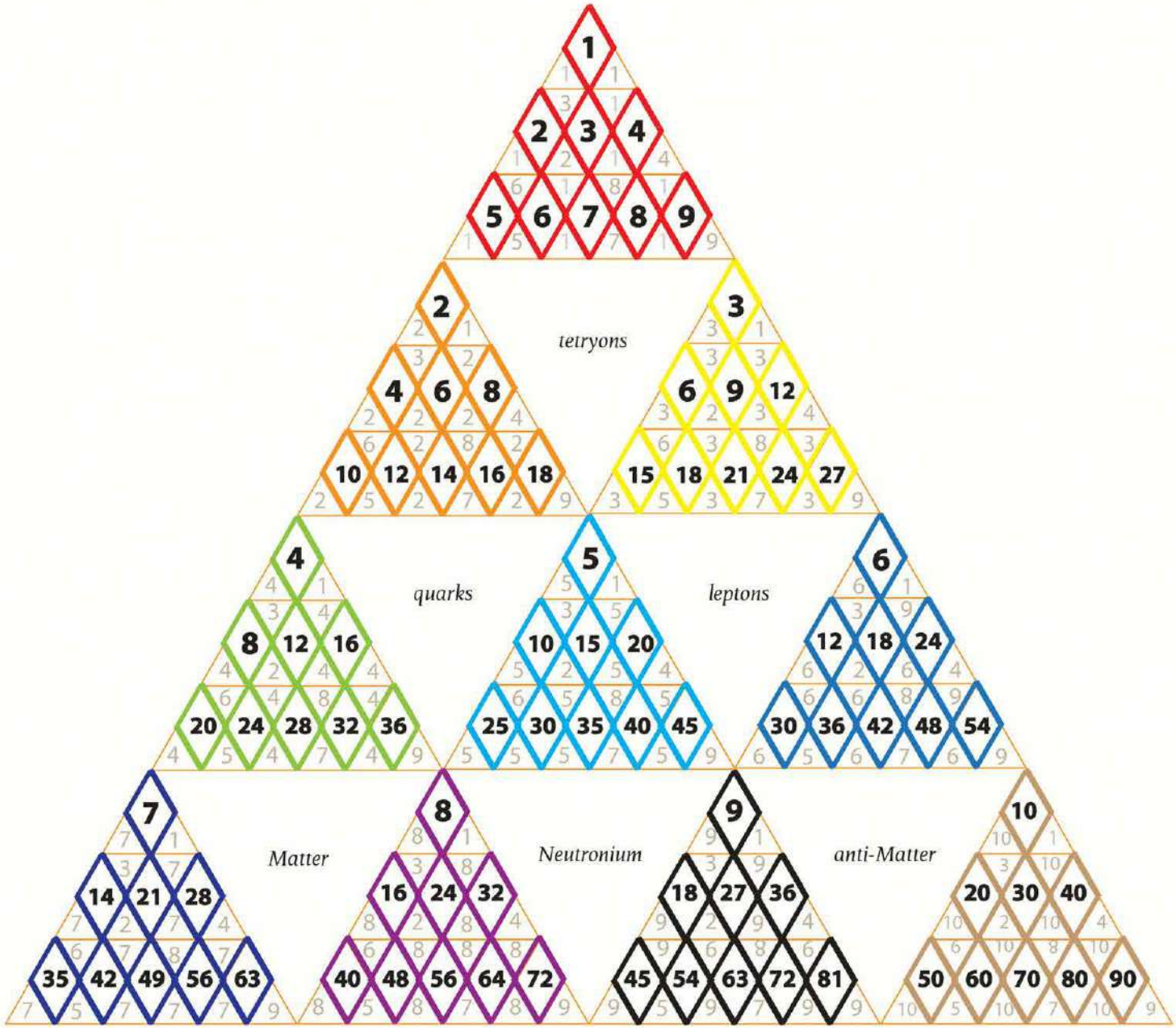

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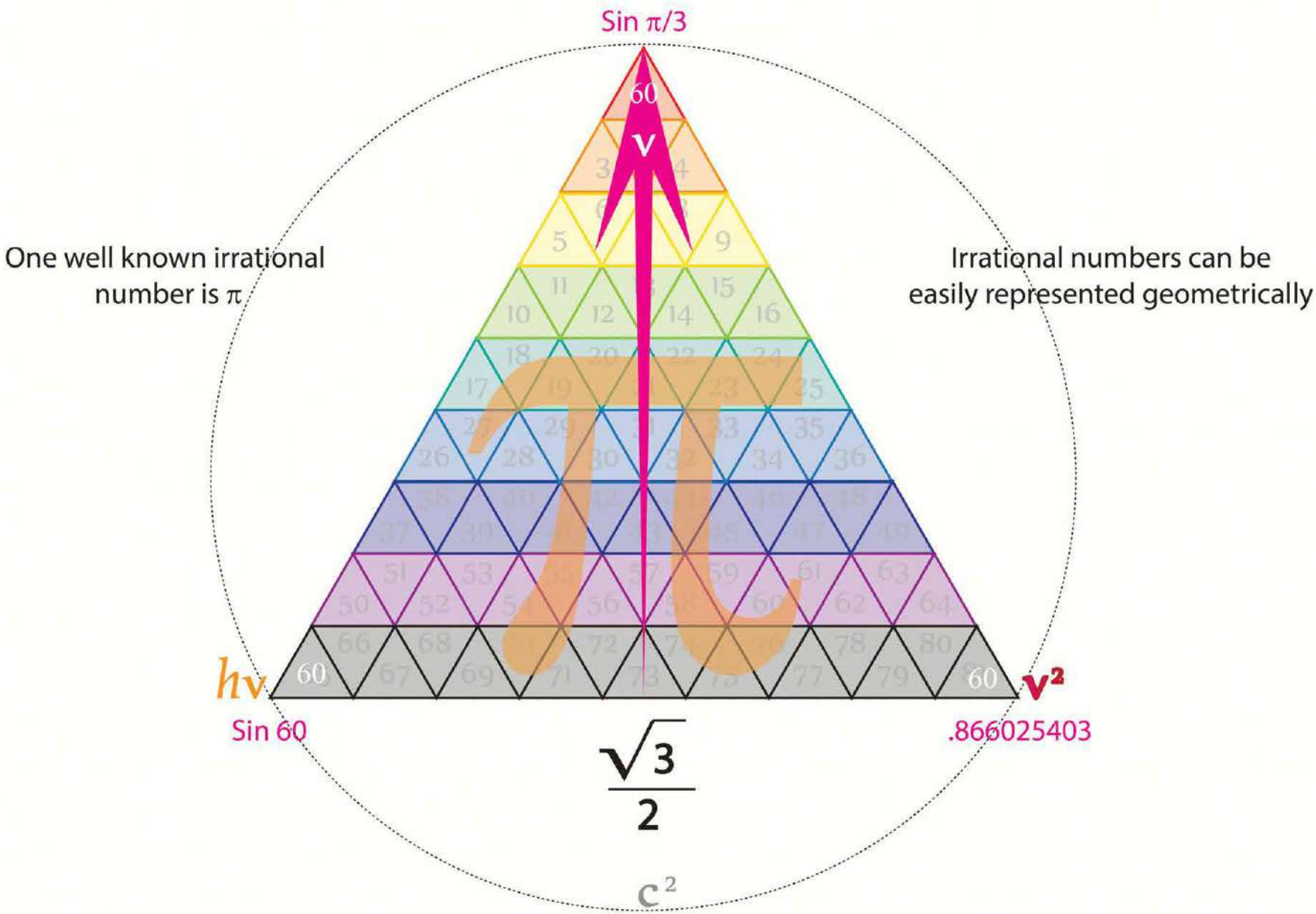
Irrational Numbers

An irrational number is defined to be any number that is the part of the real number system that cannot be written as a complete ratio of two integers



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Exponentials & Logarithms

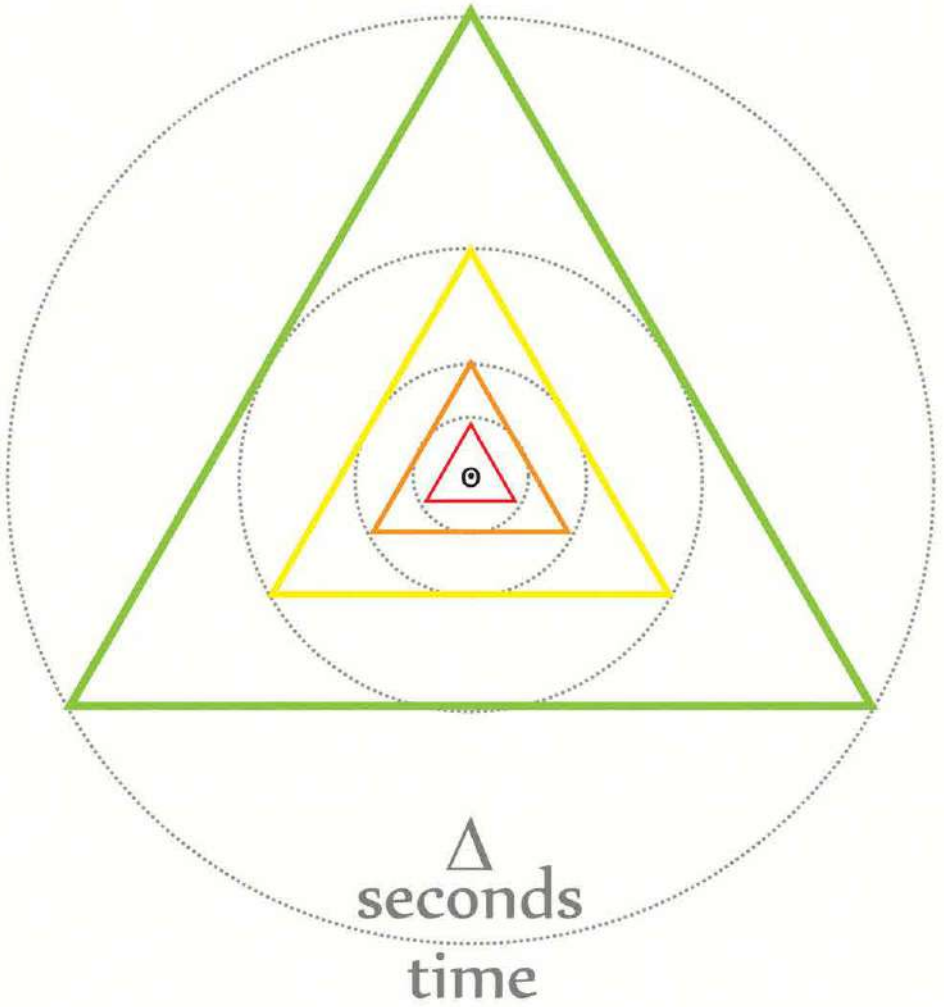
1	0
10	1
100	2
1,000	3

e and the Natural Log are inverse functions of each other:

e^x is the amount of continuous GROWTH after a certain amount of time.
Natural Log (ln) is the amount of TIME of continuous growth to reach a certain level

$10{,}000 = 10^4$

$\log(10{,}000) = 4$



e

How much growth after x units of time
(and 100% continuous growth)

$$e^x = \lim_{n\to\infty}(1+x/n)^n,$$

GROWTH

ln

ln(x) lets us plug in continuous growth
and get the time it would take.

$$\ln(x) = \lim_{n\to\infty} n(x^{1/n}-1).$$

PERIOD

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Exponential growth

GEOMETRIC

3.141592654

π

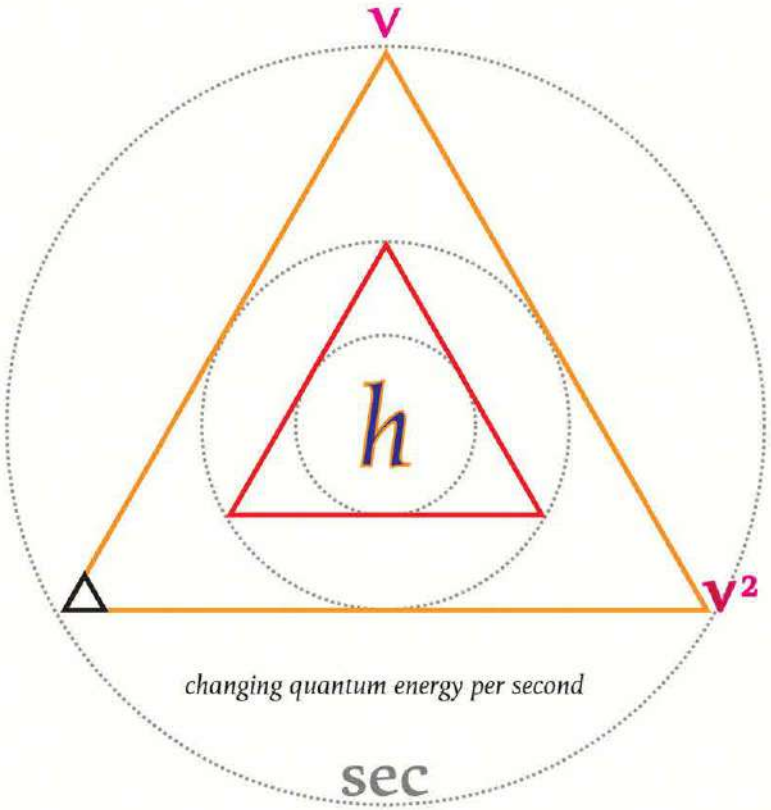
Pi is the ratio between circumference and diameter shared by all circles.

It is a fundamental ratio inherent in all circles and therefore impacts any calculation of circumference, area, volume, and surface areas

Pi radians are equally important and show all quantised equilateral energy geometries are related to their scribed circles

$$\text{growth} = e = \lim_{n \to \infty}\left(1 + \frac{r}{n}\right)^t$$

e represents the idea that all continually growing systems are scaled versions of a common rate



GROWTH

2.718281828

e

e is the base rate of growth shared by all continually growing processes.

e lets you take a simple growth rate (where all the change happens all at once at the end of a period of time - ie quantised growth)

e shows up whenever systems grow exponentially and continuously..... radioactive decay, interest calculations and populations

tetryons *EM fields* *quarks*

e can be applied to the equilateral energy geometries of physical systems only where the rate of increase is a integer factor of a squared number

leptons *Baryons*

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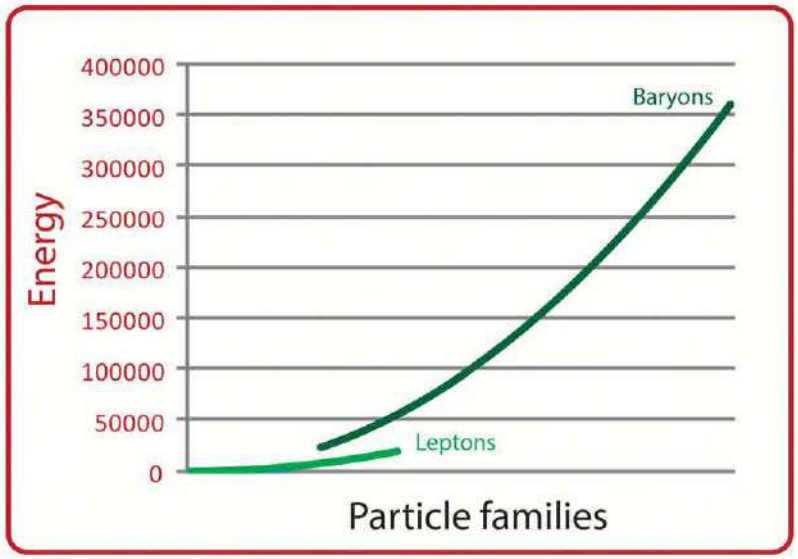
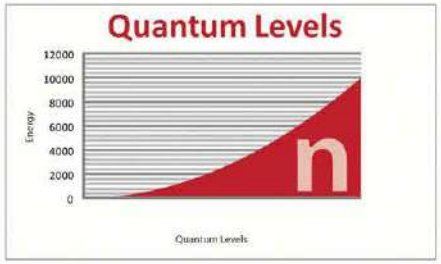
Nuclear Energy levels



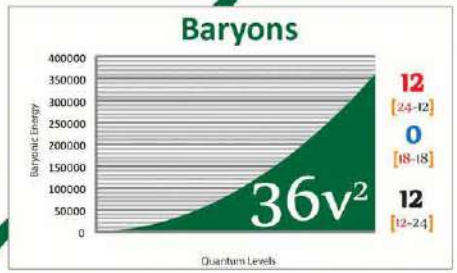
The emission and absorption of bosons and Photons within sub-atomic nuclei

Increase and decrease in integer amounts according to the charged Tetryonic topologies of the particles involved

Exponential energy levels



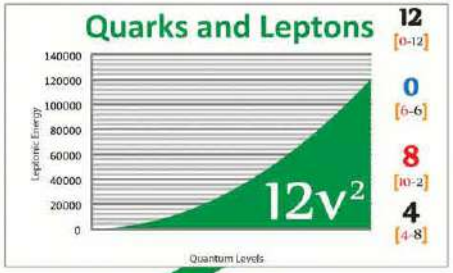
Radioactive decays follow exponential curves determined by the Tetryonic topology of the sub-atomic particle families



Proton
Neutron

antiNeutron
antiProton

$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field, Planck quanta; Baryons; ElectroMagnetic, mass, velocity)

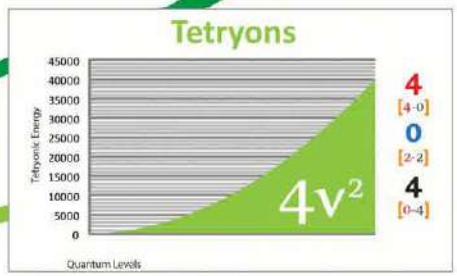


Electron
Positron

Neutrino

Up
Down
Strange
Charmed
Top
Bottom

$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (quarks, leptons; EM Field, Planck quanta; ElectroMagnetic, mass, velocity)



Positive
Negative
Neutral

$4\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (tetryons; EM Field, Planck quanta; ElectroMagnetic, mass, velocity)

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Series addition & the Riemann Zeta Function

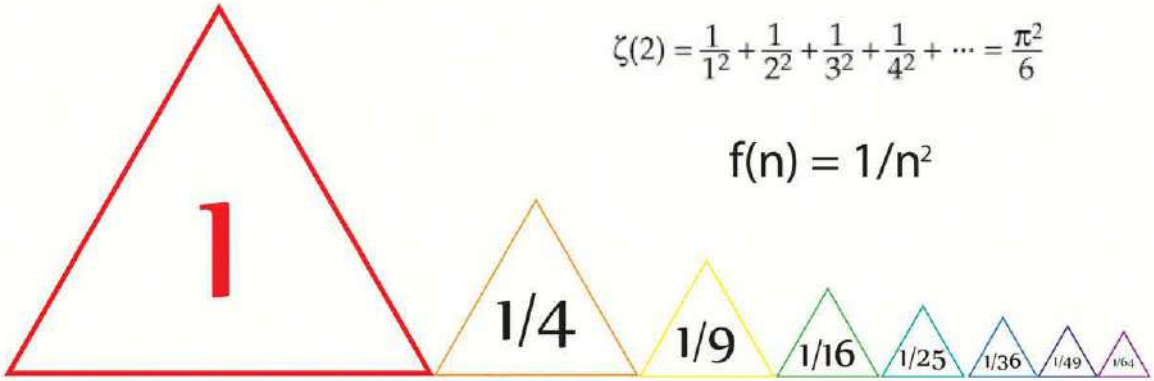
The second series addition of the Reimann Zeta function is where x=2: (pi^2)/6=1+1/2^2+1/3^2+1/4^2+...
(the sum of the reciprocals of the squares)

$$\zeta(s) = \sum_{n} \frac{1}{n^s}$$

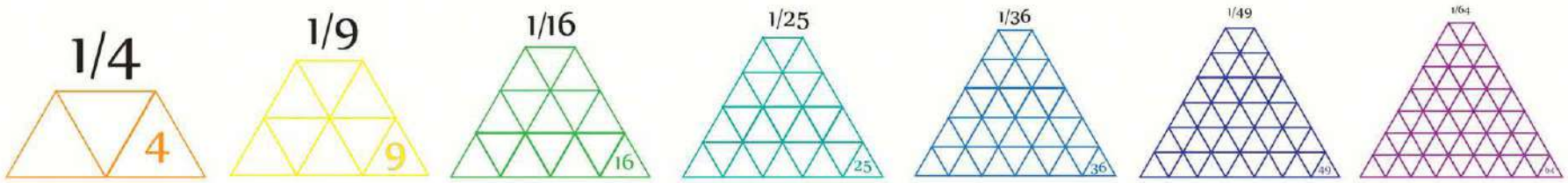
$$\zeta(2) = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots = \frac{\pi^2}{6}$$

$$\sum_{n=1}^{\infty} \frac{1}{n^x}$$

$$f(n) = 1/n^2$$



In mathematics, the Riemann zeta function, is a prominent function of great significance in number theory. It is a named after German mathematician Bernhard Riemann. It is so important because of its relation to the distribution of prime numbers. It also has applications in other areas such as physics, probability theory, and applied statistics



The mystery of prime numbers
Question: which natural numbers are prime? how are they distributed among natural numbers?

Primes are basic building blocks for natural numbers:

- any natural number is a product of prime numbers
- a prime number is only divisible by itself and by 1:
  (it cannot be further simplified)

We don't know how to predict where the prime numbers are:

"Prime numbers grow like weeds among the natural numbers, seeming to obey no other law than that of chance but also exhibit stunning regularity" (Don Zagier, number theorist)

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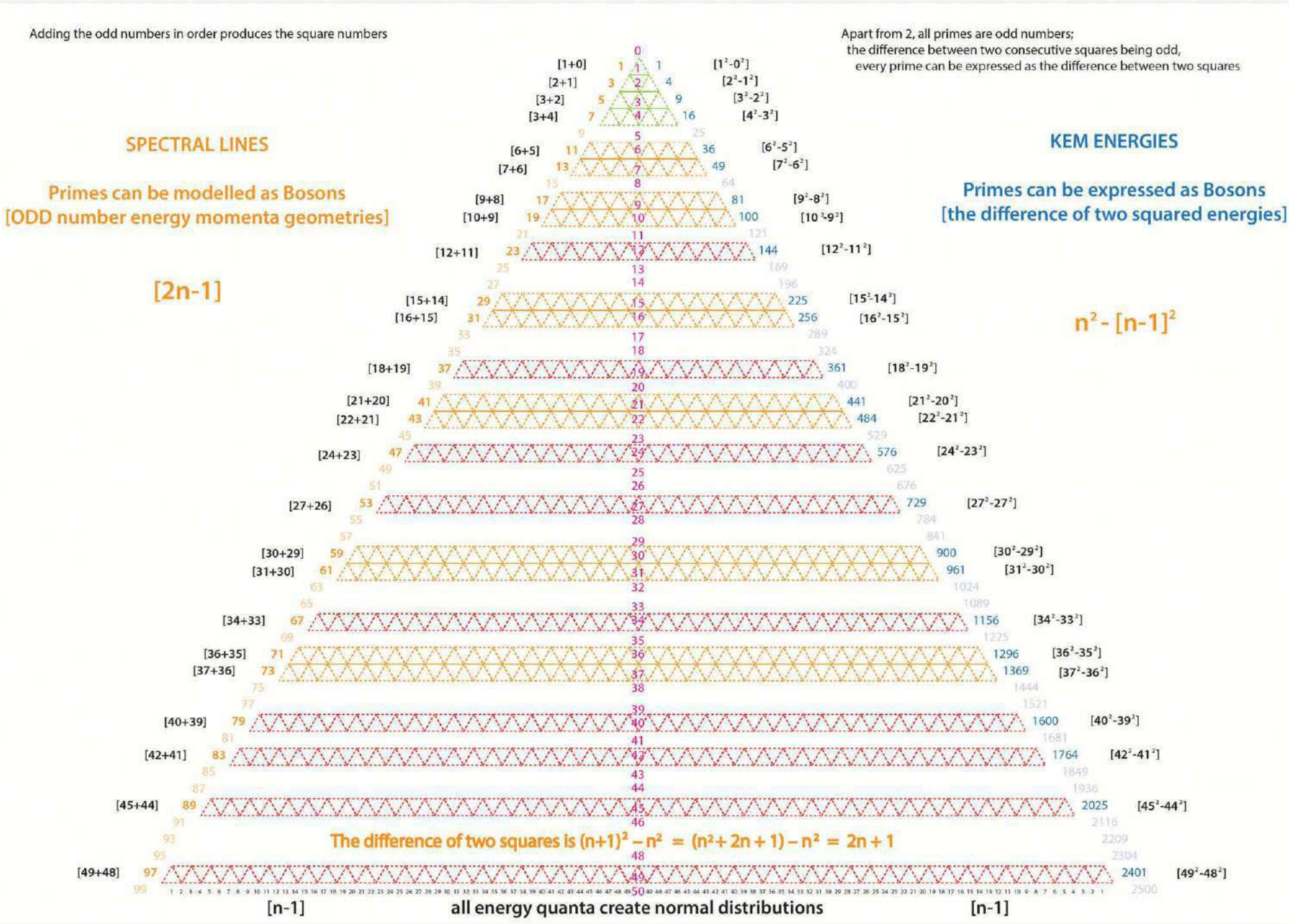
Adding the odd numbers in order produces the square numbers
Apart from 2, all primes are odd numbers;
the difference between two consecutive squares being odd,
every prime can be expressed as the difference between two squares
SPECTRAL LINES
Primes can be modelled as Bosons
[ODD number energy momenta geometries]
[2n-1]
KEM ENERGIES
Primes can be expressed as Bosons
[the difference of two squared energies]
n² - [n-1]²
[1+0] [2+1] [3+2] [3+4] [6+5] [7+6] [9+8] [10+9] [12+11] [15+14] [16+15] [18+19] [21+20] [22+21] [24+23] [27+26] [30+29] [31+30] [34+33] [36+35] [37+36] [40+39] [42+41] [45+44] [49+48]
[1²-0²] [2²-1²] [3²-2²] [4²-3²] [6²-5²] [7²-6²] [9²-8²] [10²-9²] [12²-11²] [15²-14²] [16²-15²] [18²-19²] [21²-20²] [22²-21²] [24²-23²] [27²-27²] [30²-29²] [31²-30²] [34²-33²] [36²-35²] [37²-36²] [40²-39²] [42²-41²] [45²-44²] [49²-48²]
The difference of two squares is (n+1)² – n² = (n²+ 2n + 1) – n² = 2n + 1
[n-1]
all energy quanta create normal distributions
[n-1]

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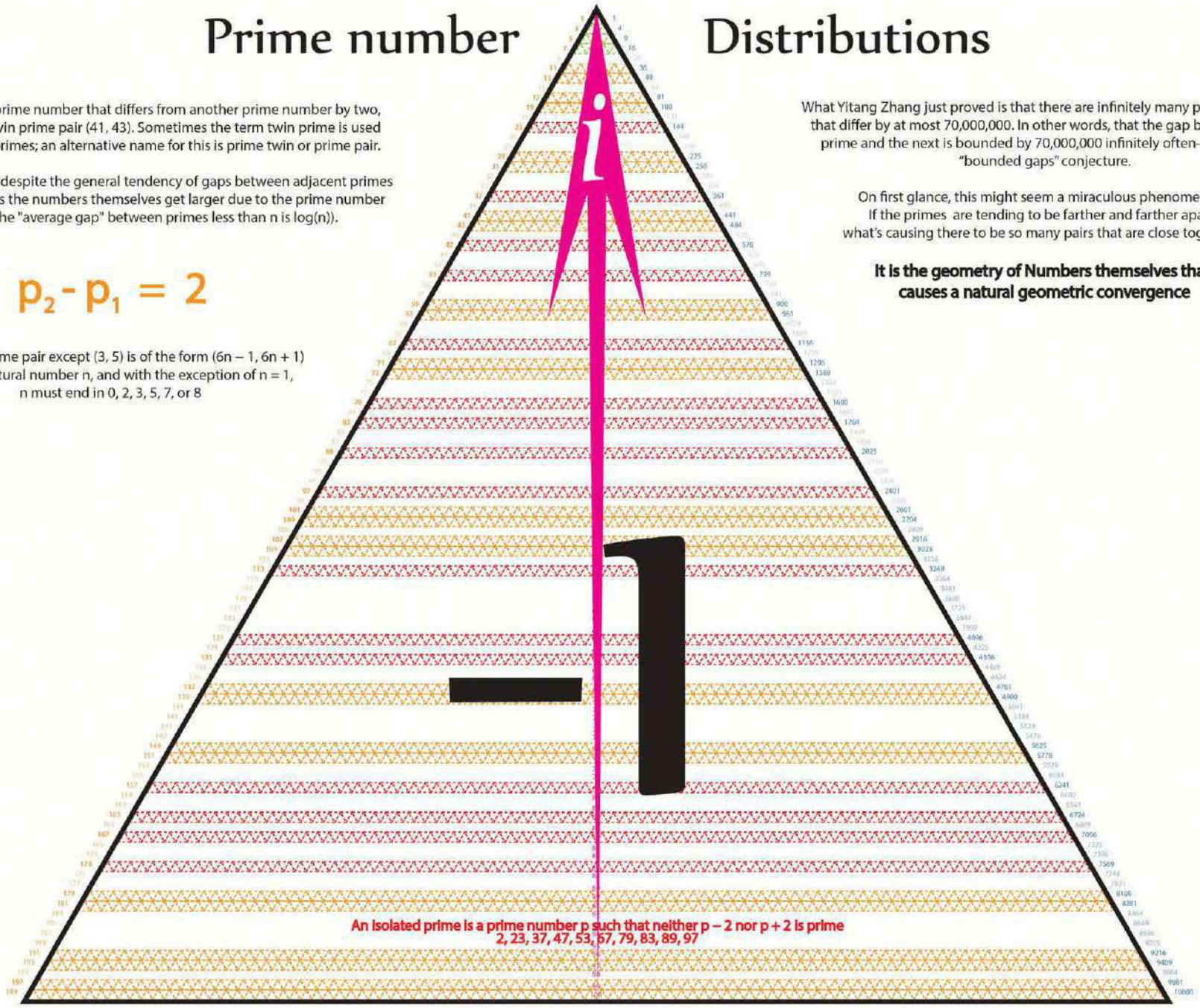
Prime number Distributions

A twin prime is a prime number that differs from another prime number by two, for example the twin prime pair (41, 43). Sometimes the term twin prime is used for a pair of twin primes; an alternative name for this is prime twin or prime pair.

Twin primes appear despite the general tendency of gaps between adjacent primes to become larger as the numbers themselves get larger due to the prime number theorem (the "average gap" between primes less than n is log(n)).

$$p_2 - p_1 = 2$$

Every twin prime pair except (3, 5) is of the form (6n – 1, 6n + 1) for some natural number n, and with the exception of n = 1, n must end in 0, 2, 3, 5, 7, or 8



What Yitang Zhang just proved is that there are infinitely many pairs of primes that differ by at most 70,000,000. In other words, that the gap between one prime and the next is bounded by 70,000,000 infinitely often—thus, the "bounded gaps" conjecture.

On first glance, this might seem a miraculous phenomenon. If the primes are tending to be farther and farther apart, what's causing there to be so many pairs that are close together?

It is the geometry of Numbers themselves that causes a natural geometric convergence

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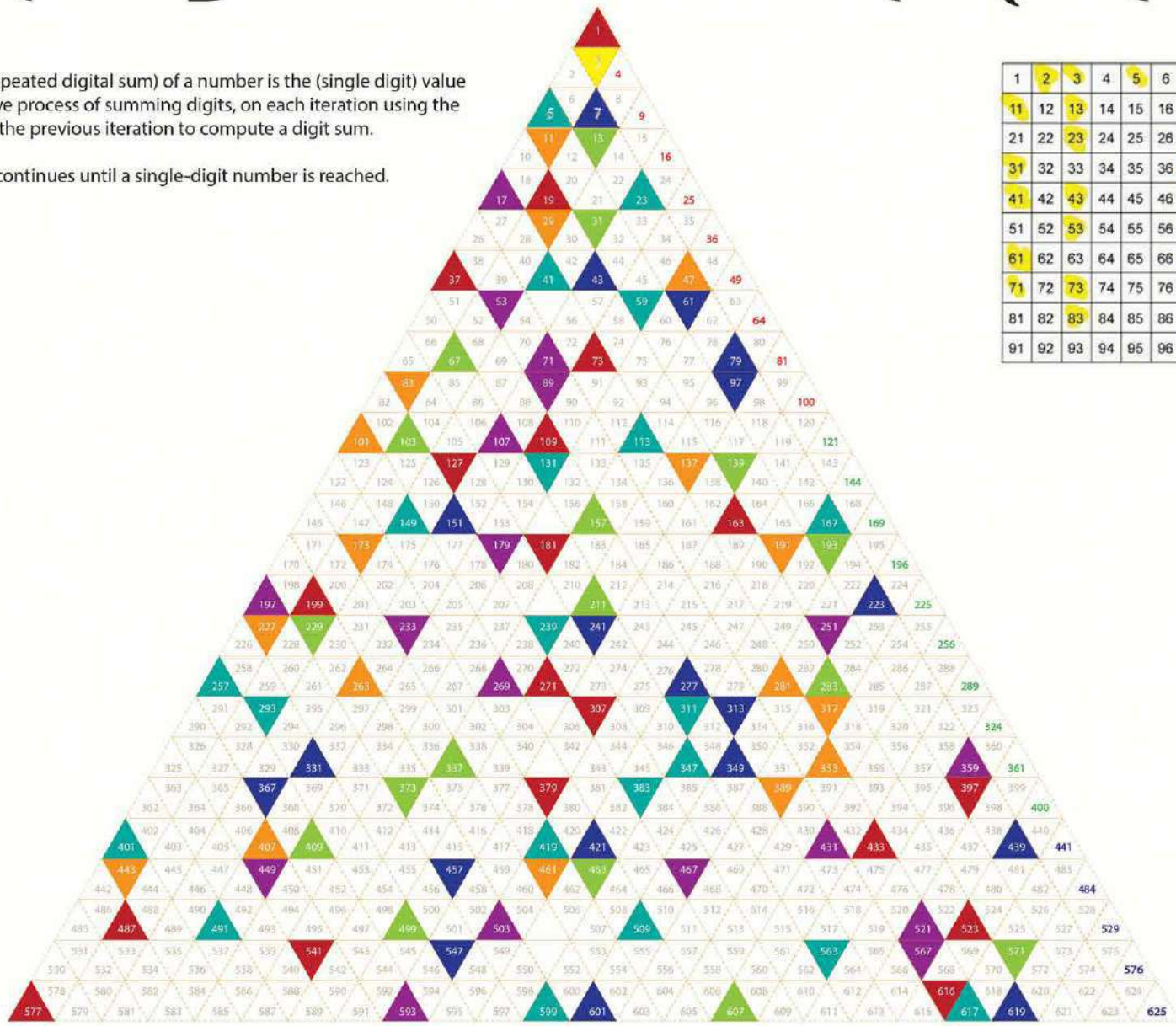
The Digital roots of Prime numbers

The digital root (also repeated digital sum) of a number is the (single digit) value obtained by an iterative process of summing digits, on each iteration using the result from the previous iteration to compute a digit sum.

The process continues until a single-digit number is reached.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



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Archimedes is given credit for the first calculus.

Archimedes infinite series

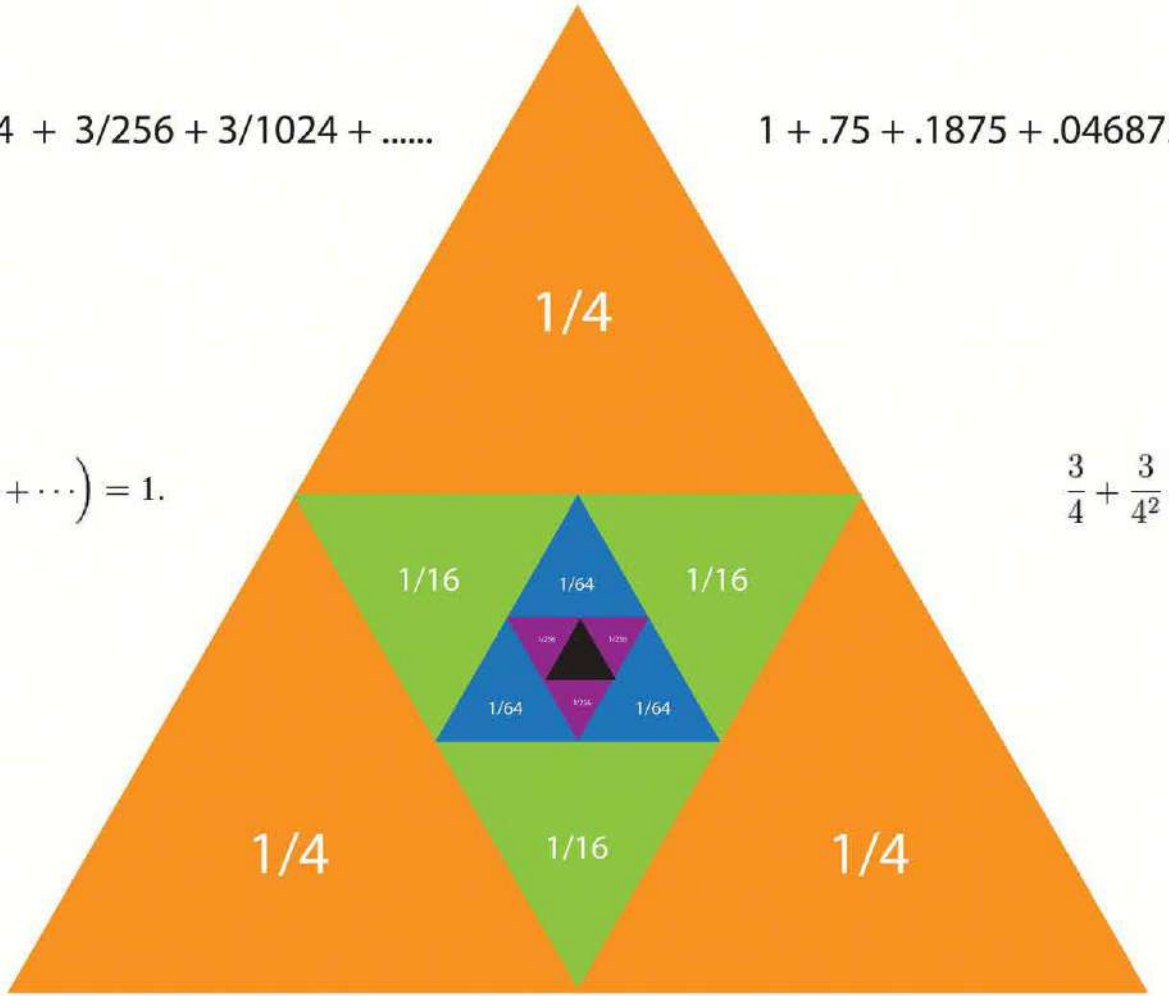
Today's calculus was published by Newton.

$1 + 3/4 + 3/16 + 3/64 + 3/256 + 3/1024 + ...$

$1 + .75 + .1875 + .046875 + .01171875 + ...$

$$3\left(\frac{1}{4} + \frac{1}{4^2} + \frac{1}{4^3} + \frac{1}{4^4} + \cdots\right) = 1.$$

$$\frac{3}{4} + \frac{3}{4^2} + \frac{3}{4^3} + \frac{3}{4^4} + \cdots = 1.$$



Nested convergent infinite series

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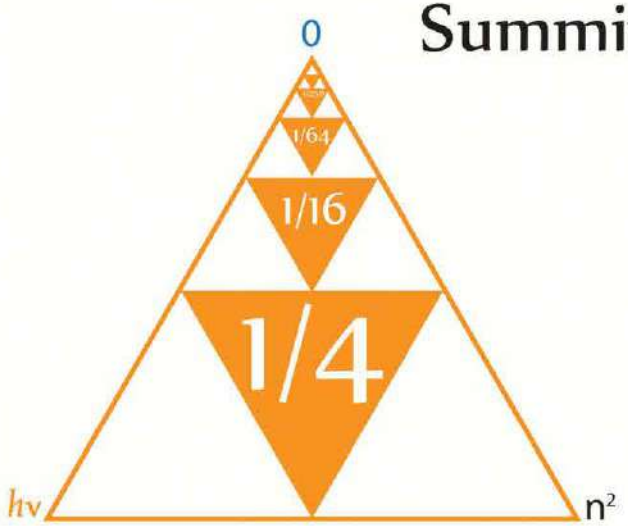
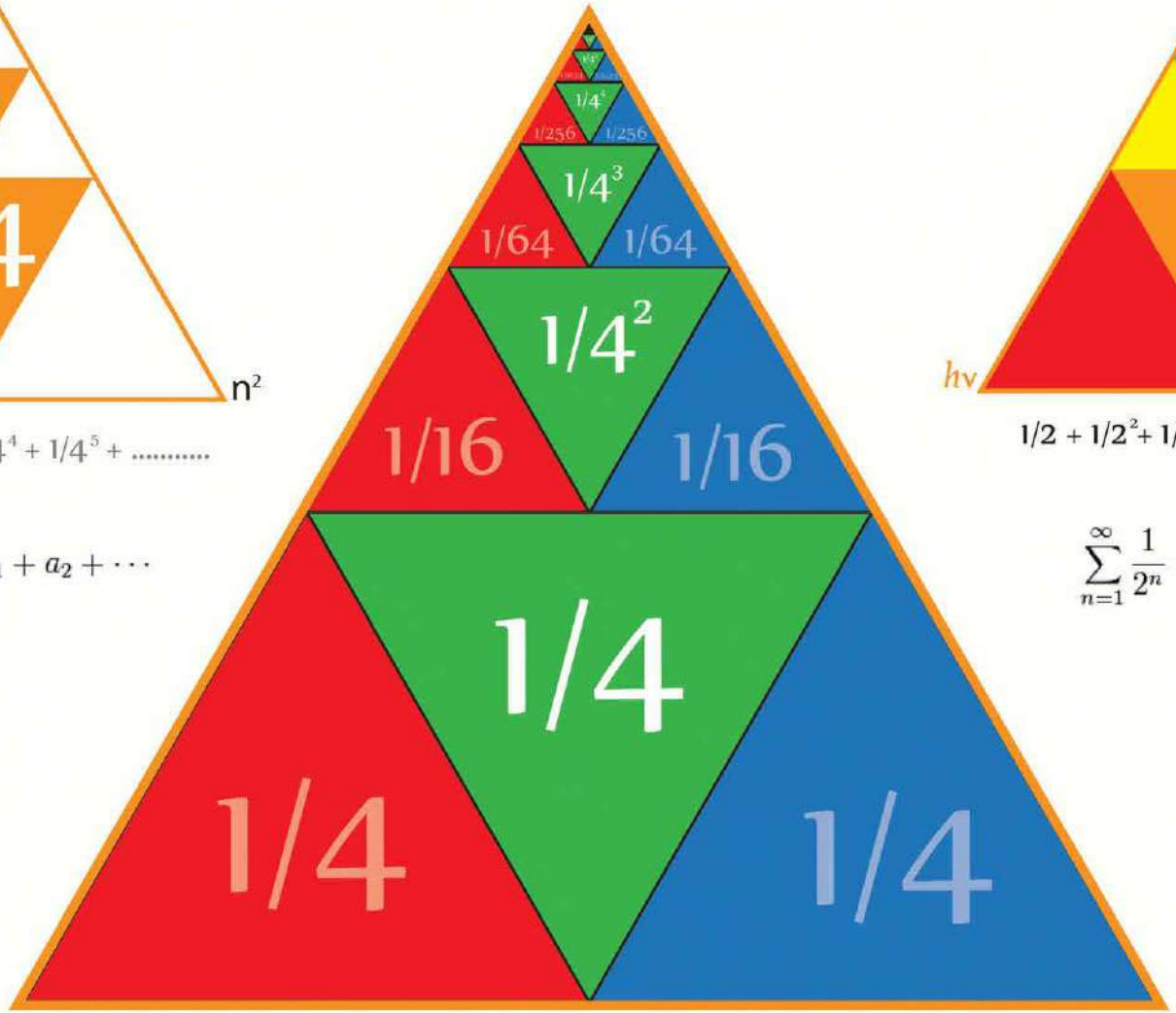
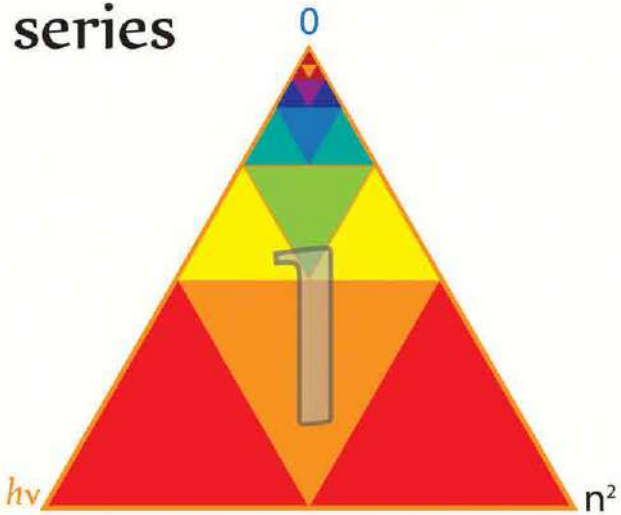
Summing a convergent infinite series



$1/4 + 1/4^2 + 1/4^3 + 1/4^4 + 1/4^5 + \ldots\ldots\ldots$

$$\sum_{n=0}^{\infty} a_n = a_0 + a_1 + a_2 + \cdots$$





$1/2 + 1/2^2 + 1/2^3 + 1/2^4 + 1/2^5 + \ldots\ldots\ldots$

$$\sum_{n=1}^{\infty} \frac{1}{2^n} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots.$$

ODDS = 2n-1

$$\sum_{1}^{n} 2n\text{-}1 = n^2$$

Summing the dissimilar coloured equilateral triangles gives unity

1/3 1/3 1/3

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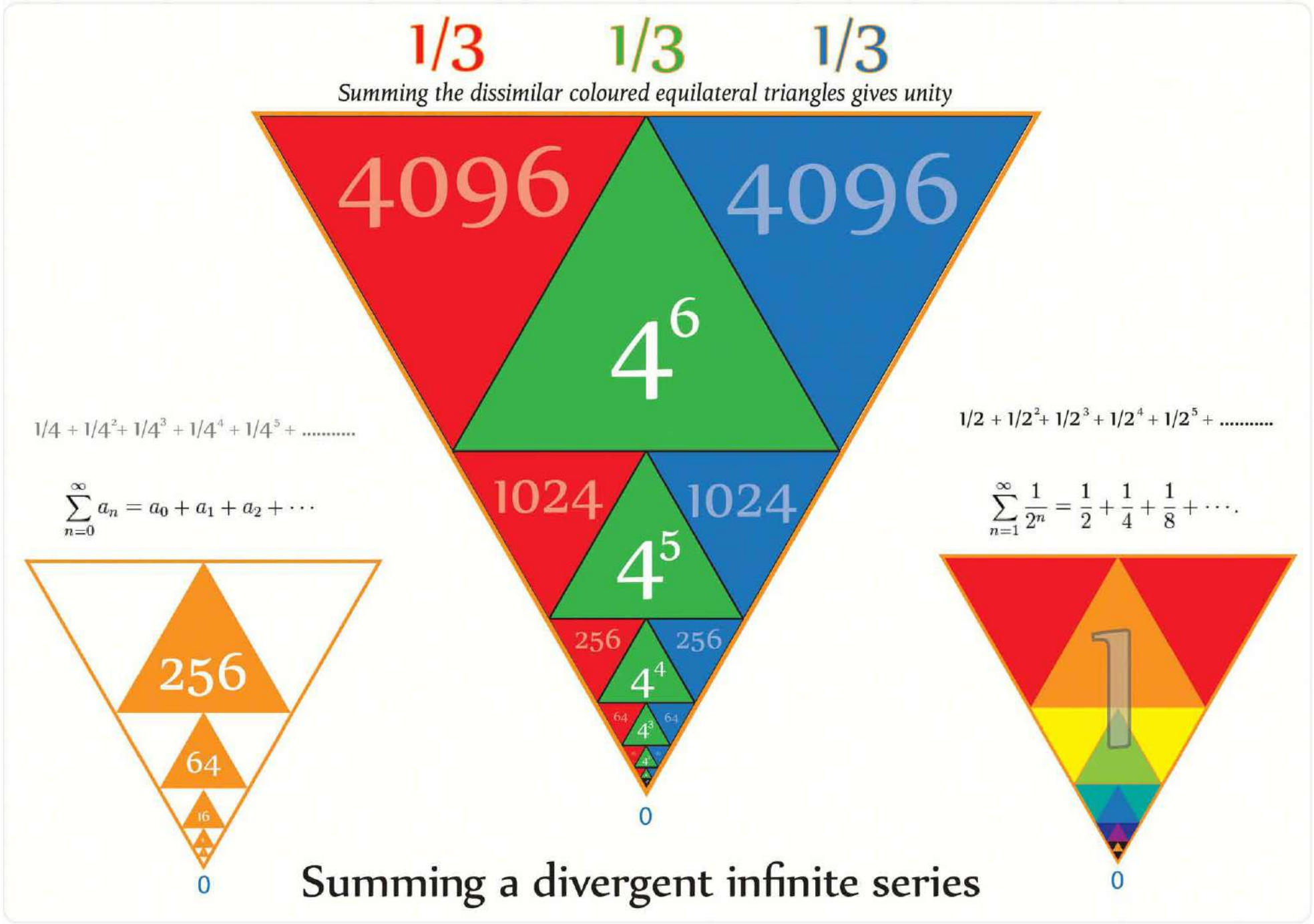

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The Basel Problem

Pietro Mengoli

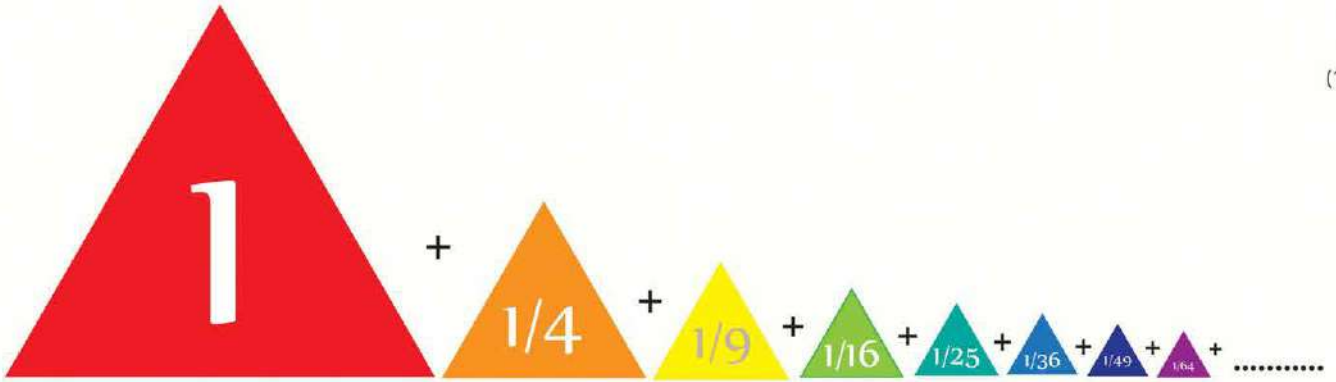
(1626 – June 7, 1686)

Leonhard Euler

(15 April 1707 – 18 Sept 1783)

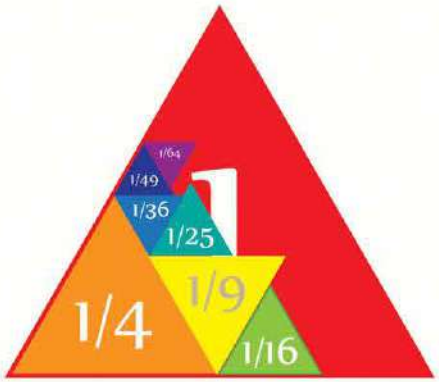
The Basel problem is a famous problem in mathematical analysis with relevance to number theory, first posed by Pietro Mengoli in 1644 and solved by Leonhard Euler in 1735.

$$\zeta(2) = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots = \frac{\pi^2}{6} \approx 1.644934$$

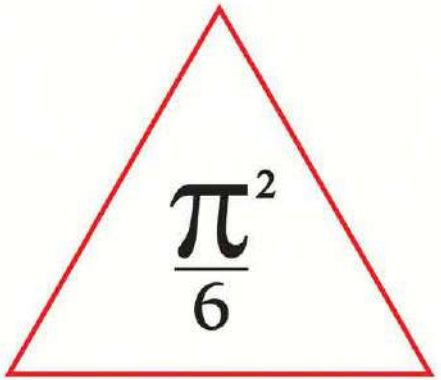


The Basel problem asks for the precise summation of the reciprocals of the squares of the natural numbers, i.e. the precise sum of the infinite series

$$f(n) = 1/n^2$$



$\approx$



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Integrals of mass-energy

is a means of finding scalar areas using summation and limits.

Integration is a micro adding of ***CONTINUOUS*** quantities.

$$\int_{n}^{\infty} f(x)$$

Integration is a special case of summation.

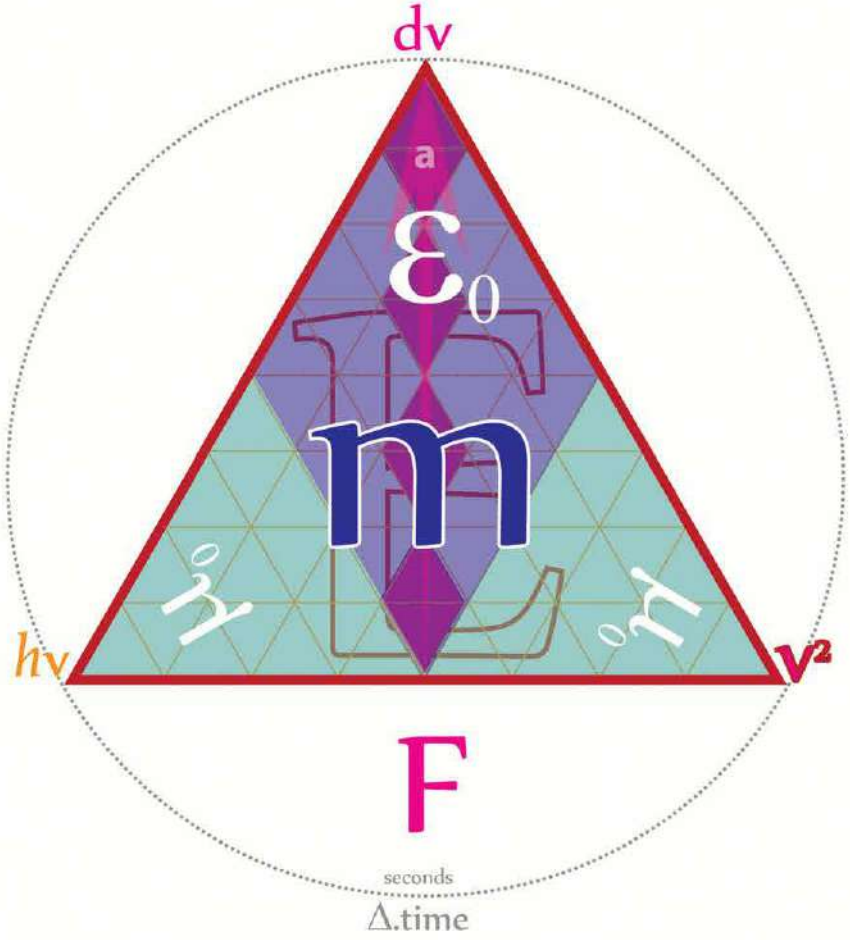
Integration is defined as the limit of a summation as the number of elements approches infinity while a part of their respective value approaches zero.

Summation is the finite sum of multiple, fixed values.

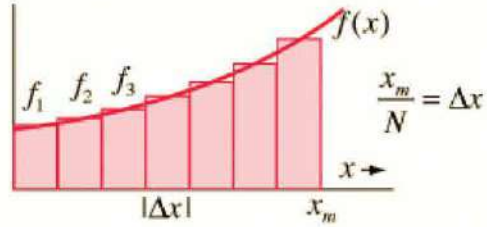
$$\sum_{n}^{\infty} x$$

Summation is a macro adding of ***DISCRETE*** quantities.

The summation of equilateral energy momenta quanta with respect to their linear vector components



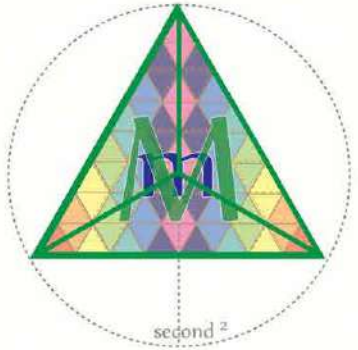
Integrating the energy quanta contained within equilateral charge geometry gives the variable Force required to acheive changes in motion [Energy, work, acceleration]



The Integral of the continuous area under the curve is the summation of an infinte number of disctrete rectangular measurements made to a specified limit

An integration isn't a simple summation, but the limit of a sequence of summations

All Planck energies are discrete equilateral geometries



mass is the surface integral of EM energy geometries per unit of time

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"The calculus of infinitesimals"

The fundamental theorem of calculus
simply states that the sum of infinitesimal changes in a quantity over time
adds up to the net change in the quantity.

Scalar Energy

$E = mv^2$

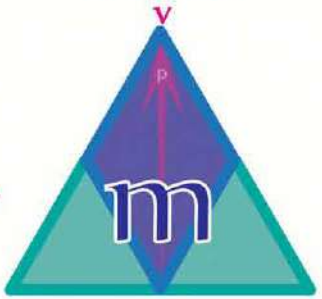
Leibniz's vis viva (Latin for living force) is mv2,

[2 x kinetic energy]

Gottfried Wilhelm von Leibniz

(July 1, 1646 – November 14, 1716)

vector Force



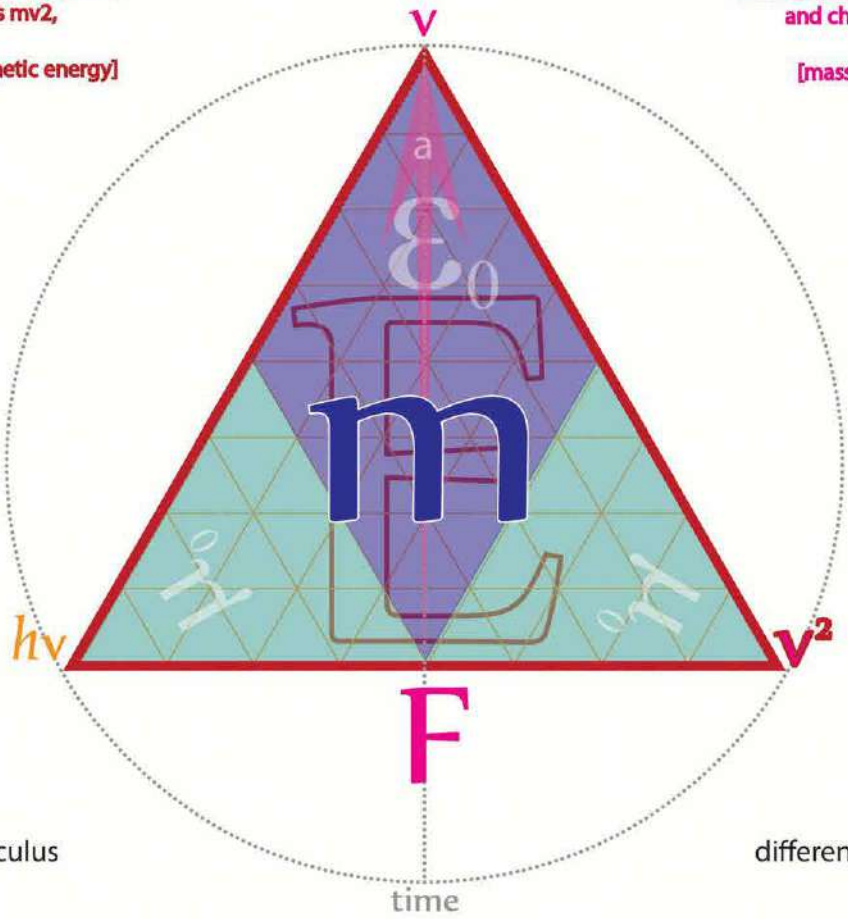
$F = m[dv/dt]$

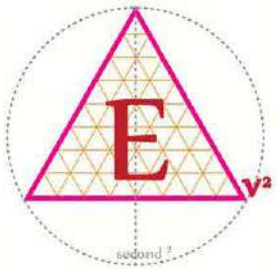
Much of Newton's work centred around momentum and changes to it

[mass.velocity]

Sir Isaac Newton

(1643-1727)

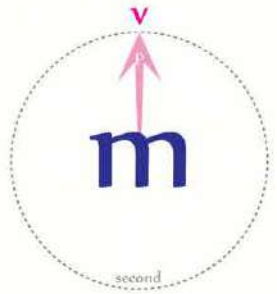




integral calculus

The founders of calculus thought of the integral as an infinite sum of rectangles of infinitesimal width

differential calculus



In calculus, a branch of mathematics, the derivative is a measure of how a function changes as its input changes

The fundamental theorem of calculus is a theorem that links the concept of the integral with the derivative of a function.

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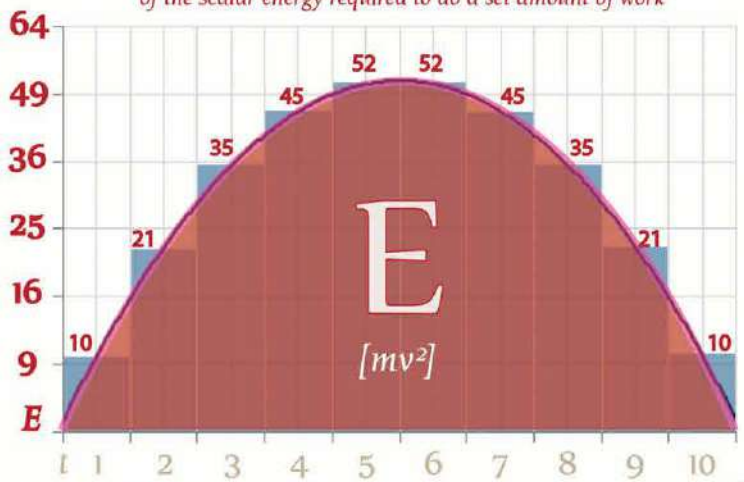
Leibniz
scalar energies

linear momentum is the square root vector force of the scalar energy required to do a set amount of work



Energy momentum geometries

$$E = p^2$$

Energy momentum

$$kg\left[\frac{m}{s}\right]^2$$

print out this page

then cut out the 10 Planck energy momenta triangles shown

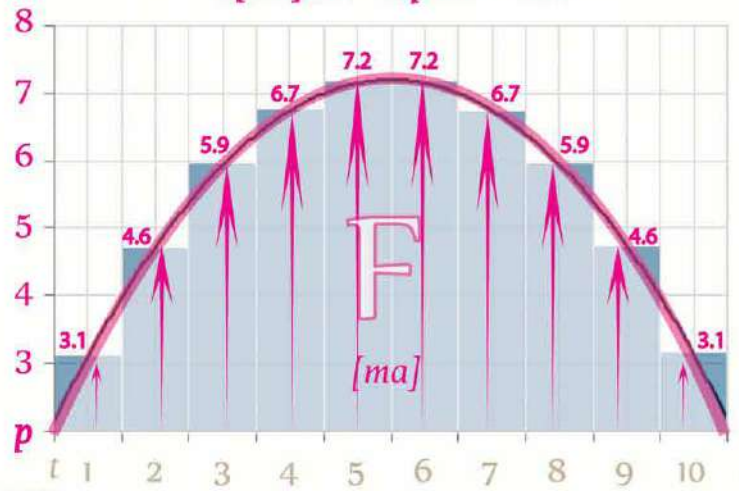
slice fine lines along the pink linear momentum arrows with a razor blade or similar as highlighted under the Newtonian acceleration curve

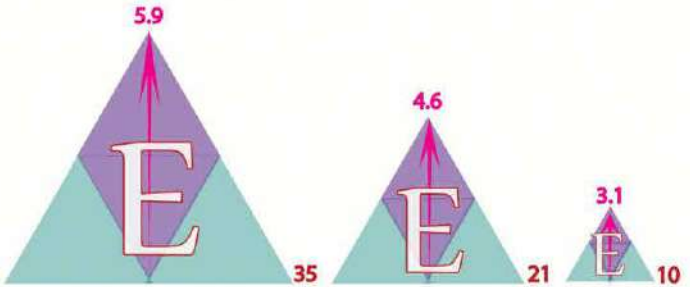
slide the cut-out triangles into the slots created

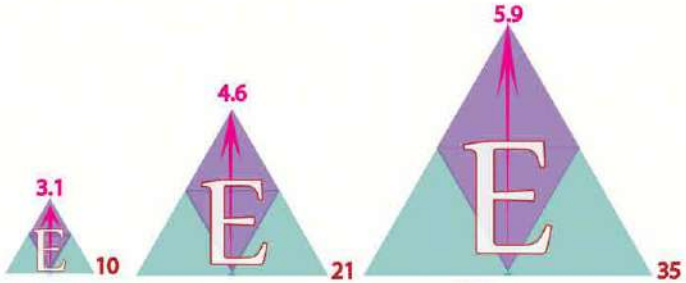
rotate the assembled model to show the real force momenta geometry at work

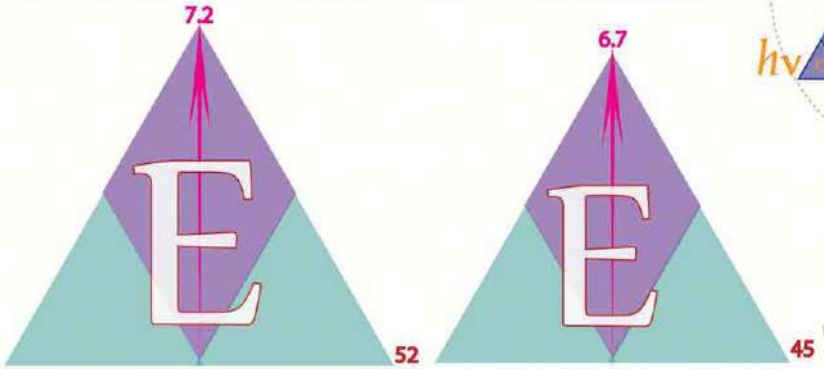
Newton
linear momentum

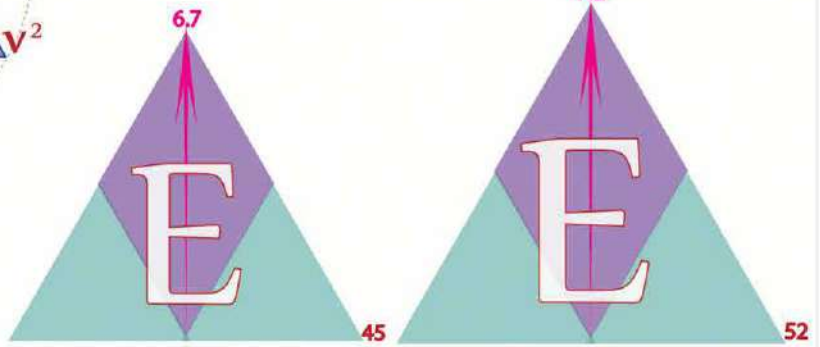
$$d[mv]/dt = dp/dt = ma$$











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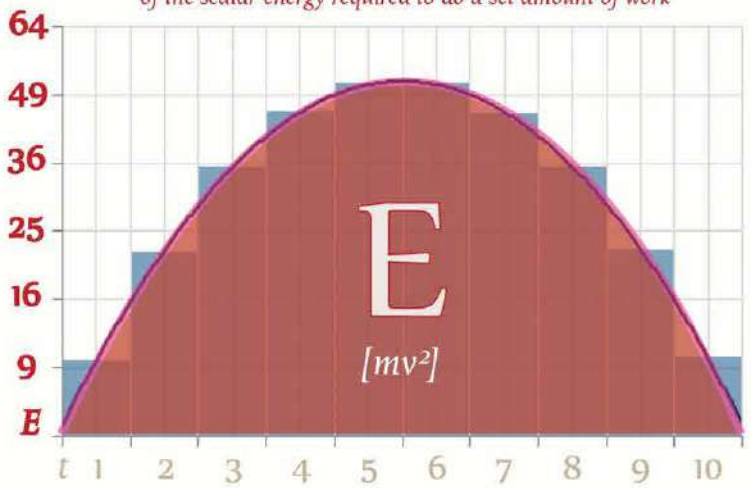
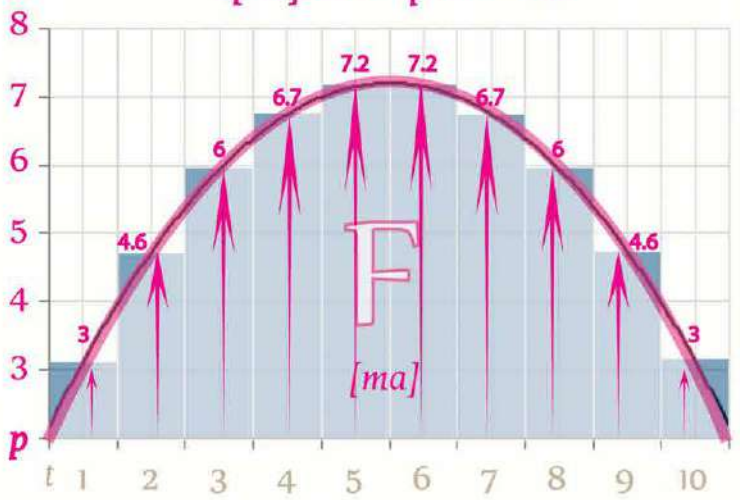
linear momentum is the square root vector force
of the scalar energy required to do a set amount of work



p
linear momentum
$\mathrm{kg}\,\frac{\mathrm{m}}{\mathrm{s}}$

print out this page

$d[mv]/dt = dp/dt = ma$

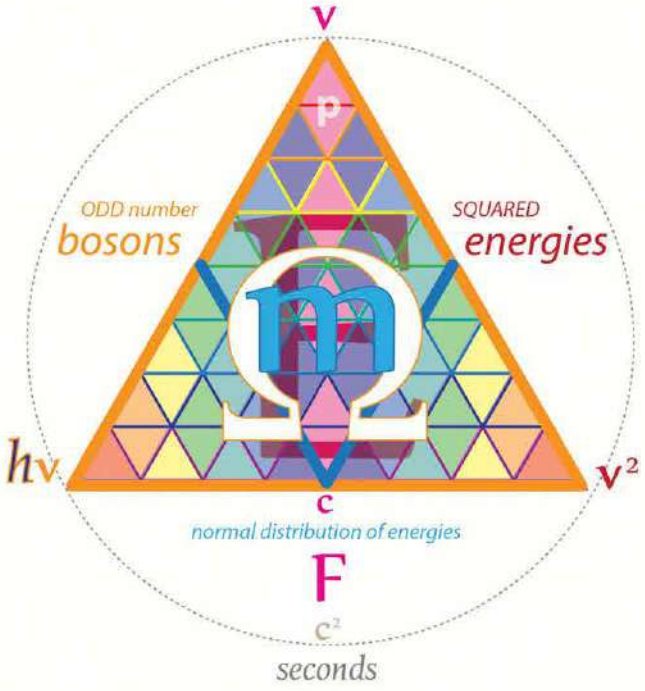


Leibniz
scalar energies

$E = mv^2$

mass-energy momenta relationship

square root equilateral energy is linear momentum



Newton
linear momentum

$F = ma$

mass is a scalar constant relating Force to acceleration

$F = m\frac{\Delta v}{\Delta t}$

Planck quanta and their vector linear momentum
lie at 90 degrees to the angle use in the graphs of motion in calculus

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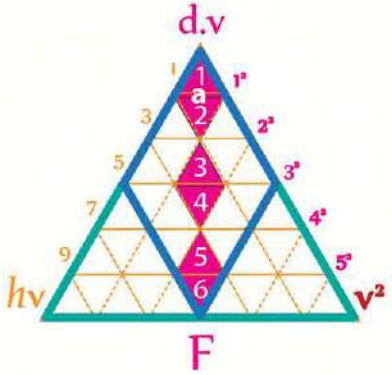
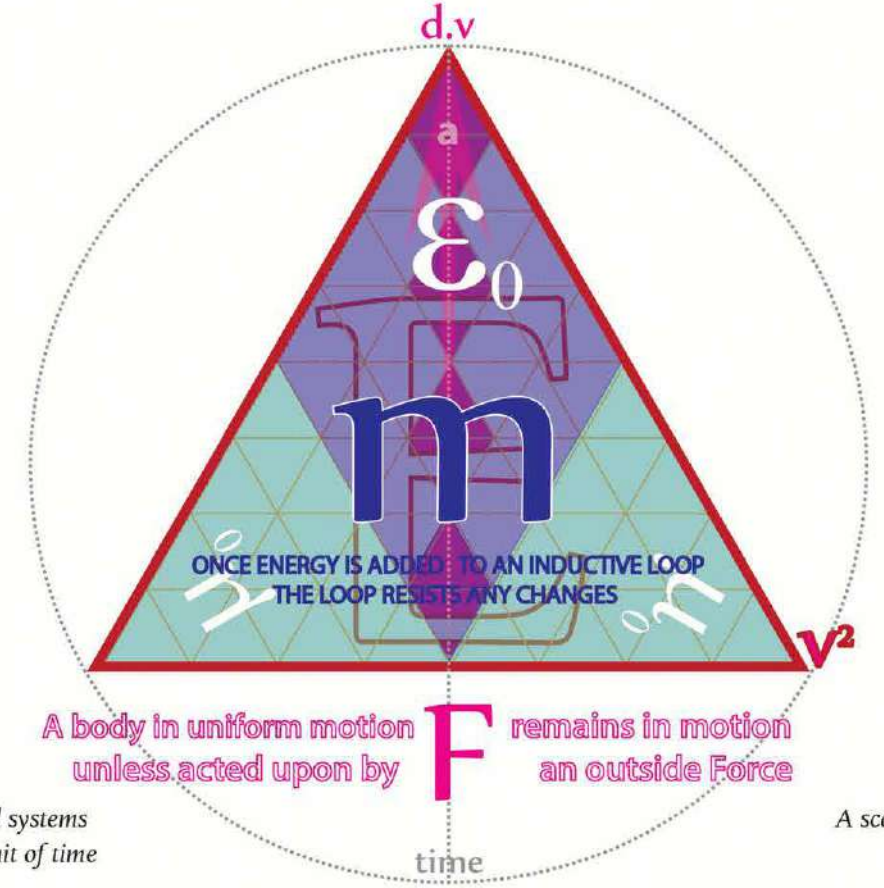
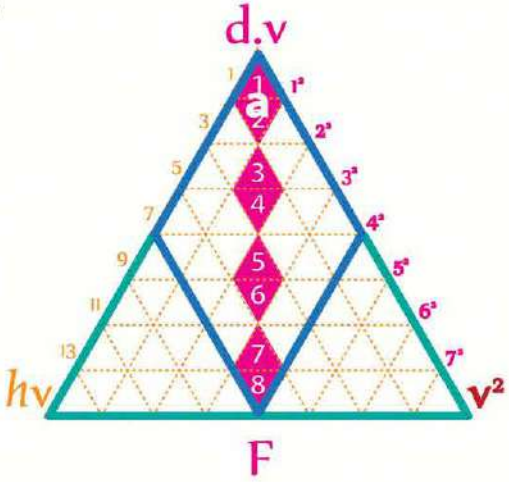
Differentiation

Differentiation is concerned with things like speeds and accelerations, slopes and curves etc.
These are Rates of Change, they are things that are defined locally.



An increase in a force opposing an object's vector velocity results in ***DECCELERATION***





An increase in a force in line with an object's vector velocity results in ***ACCELERATION***

A linear measure of Forces acting on physical systems resulting in changes to distance covered per unit of time

A scalar measure of Forces acting on physical systems resulting in changes to their rate of motion

$$v = \frac{\Delta d}{\Delta t}$$

$$= m/s$$

$$F = ma$$

In physics, the derivative of the displacement of a moving body with respect to time is the velocity of the body, and the derivative of velocity with respect to time is acceleration.

$$\sum \mathbf{F} = \frac{d\mathbf{p}}{dt} = m\frac{d\mathbf{v}}{dt} + \mathbf{v}\frac{dm}{dt}$$

Newton's second law of motion states that the derivative of the momentum of a body equals the force applied to the body.

$$a = \frac{\Delta v}{\Delta t}$$

$$= m/s^2$$

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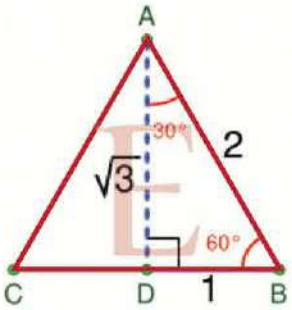
Visualising the geometric half-truths of relativistic physics

The source of all the physical relationships of mass-energy momenta and the constants in Physics is the Equilateral Triangle (and all texts must be corrected)



Energy geometries within Physics including Special Relativity with its Lorentz corrections have historically been incorrectly illustrated through the geometry of right angled triangles

Physics is geometry, one cannot be separated from the other

Equilateral geomtries lead to a intuitive understandings of Physics, Chemistry, Electrodynamics and Gravitation along with all the other apsects of Nature.

$$mv^2 = E = hv^2$$

ENERGY

6.629432673 e-34 J

Planck quanta

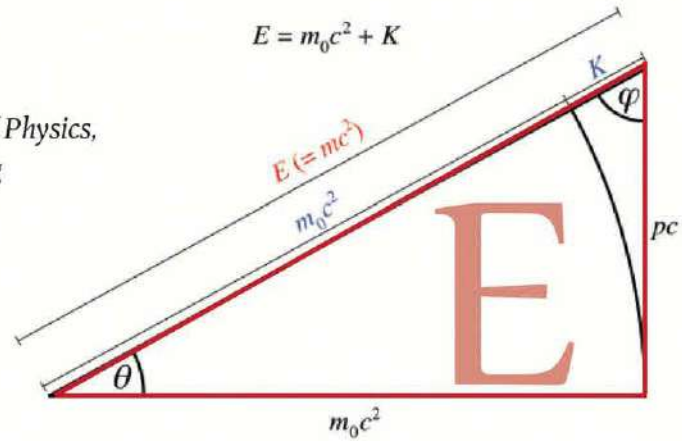
$[m\Omega v^2]$

mass velocity

7.376238634 e-51 kg

momentum

$$p^2 = mv^2$$



$$E^2 = p^2c^2 + m_0^2c^4$$

Generalizing, we see that the square of the total energy, mass, or distance in spacetime is the sum of the components squared.

We can see an origin of distance in spacetime relating to velocity in pc in which Energy is subject to Lorentz corrections [v/c]

$$E = pc.$$

Additionally, EM mass can be directly related tot the Energy content of a body by the velocity of Energy

$$E = mc^2$$

$$\mathbf{F}$$

$$\sum \mathbf{F} = \frac{d\mathbf{P}}{dt} = m\frac{d\mathbf{v}}{dt} = m\mathbf{a}$$

$$\mathbf{F} = m\mathbf{a}\,.$$

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Velocity

In physics, velocity is the measurement of the rate and direction of change in the position of an object.

It is a vector physical quantity; both magnitude and direction are required to define it.

The scalar absolute value (magnitude) of velocity is speed, a quantity that is measured in metres per second (m/s or ms−1) when using the SI (metric) system.

$$\frac{m}{s}$$

Speed is the scalar value of the
Distance traveled per unit of TIme

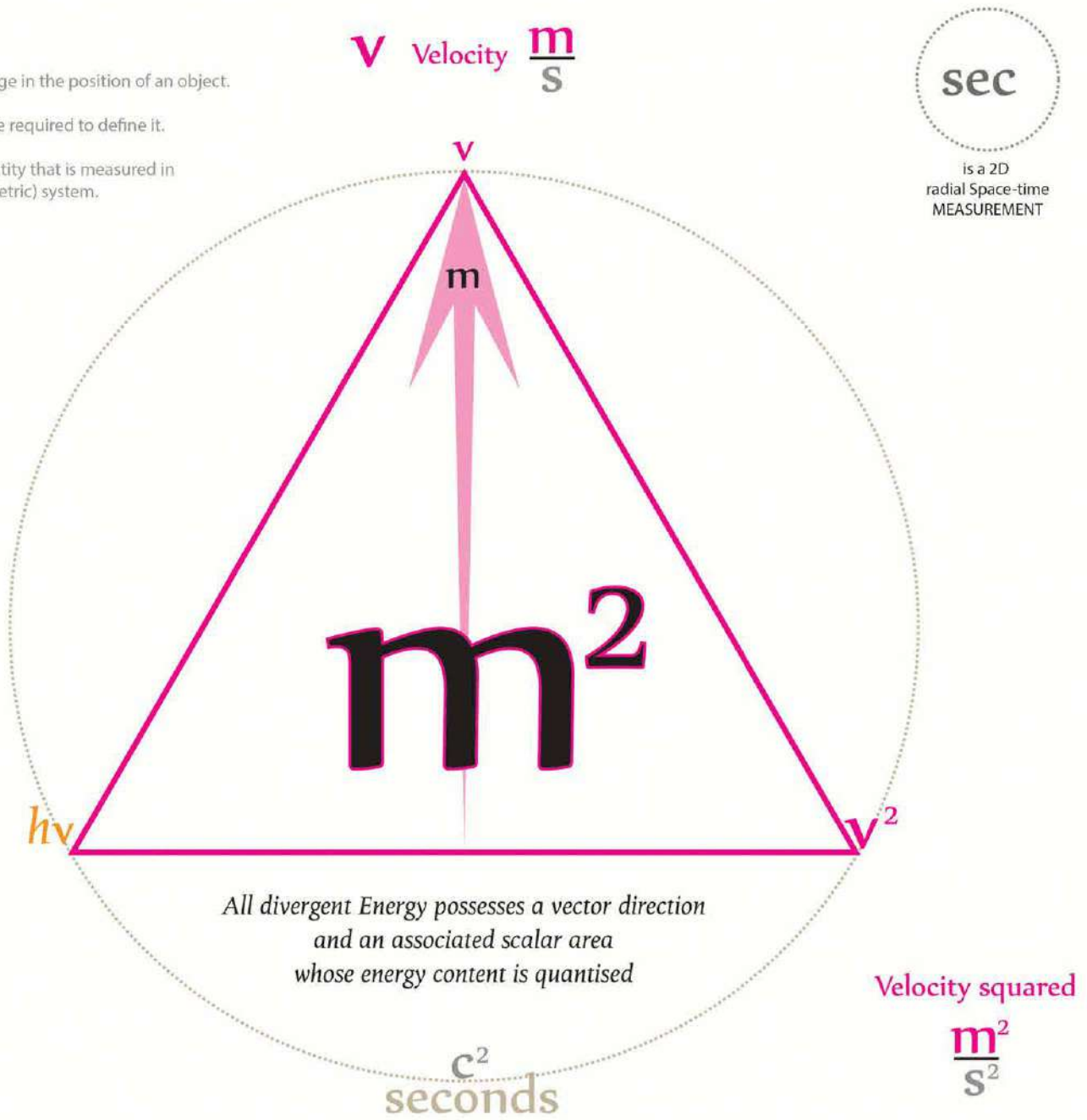
$$\bar{v} = \frac{\Delta x}{\Delta t}.$$

Velocity is the vector value of the
Distance traveled per unit of Time

$$\frac{\vec{m}}{s}$$

Velocity squared is the scalar value of the
Distance traveled per unit of Time squared
(Energy of a given spatial volume)

$$\frac{m^2}{s^2}$$



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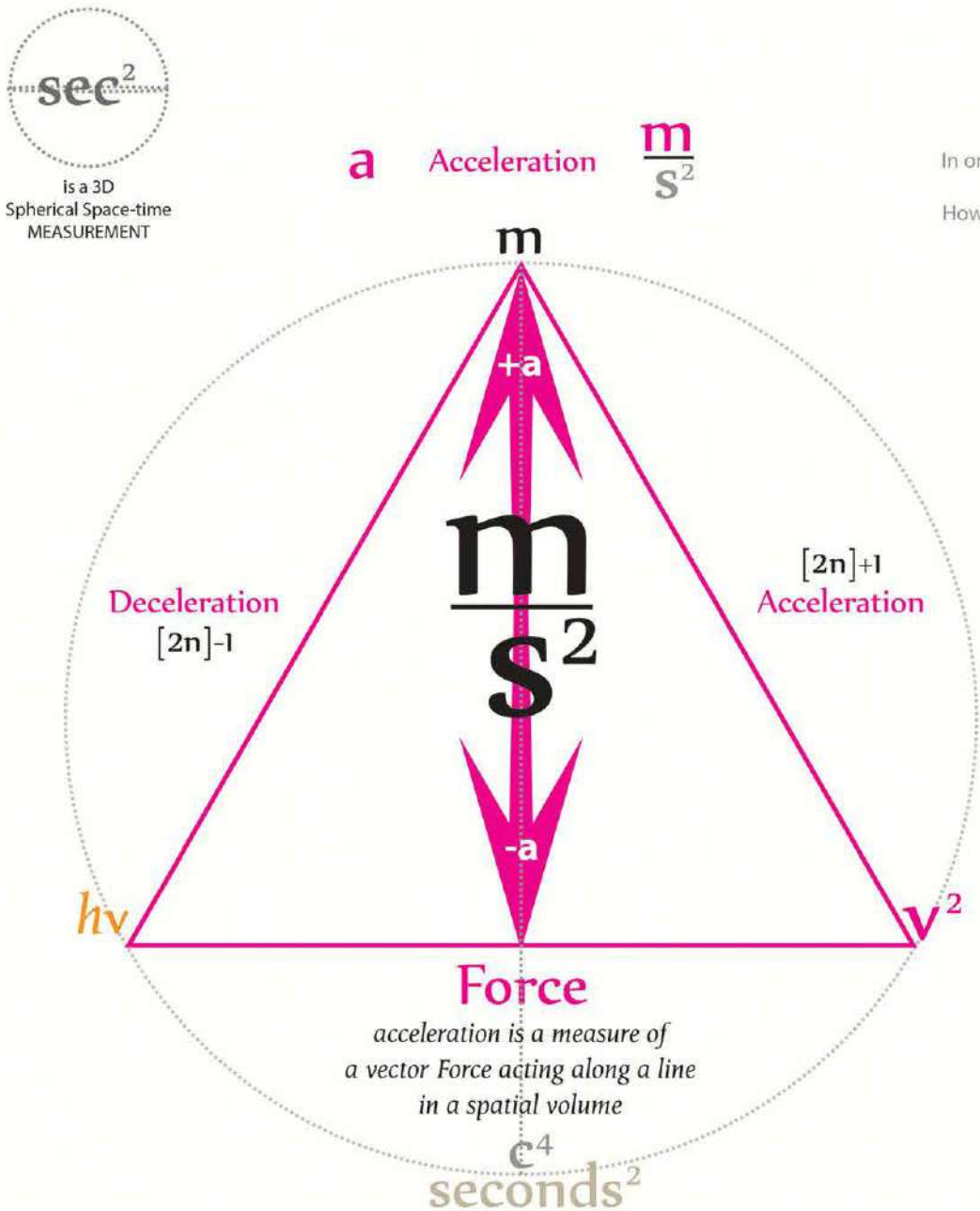

Acceleration

In physics, acceleration is the rate of change of velocity over time [dt]

In one dimension, acceleration is the rate at which something speeds up or slows down.

However, since velocity is a vector, acceleration describes the rate of change of both the magnitude and the direction of velocity.

Acceleration has the dimensions [Length]/[Time Squared]
In SI units, acceleration is measured in meters per second squared (m/s^2).

$$a = \frac{\Delta y}{\Delta x} = \frac{\Delta v}{\Delta t}.$$

In classical mechanics, for a body with constant mass,
the acceleration of the body is proportional to the net force acting on it
(Newton's second law)

$$F=ma \longrightarrow a=F/m$$

Force

$$kg\,\frac{m}{s^2}$$

Additionally, for a mass with constant velocity,
(ie in an inertial frame)
the energy of motion is expressed as its momentum
(acceleration causes changes in Energy-momentum)

$$p = kg\,\frac{m}{s}$$

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Momentum

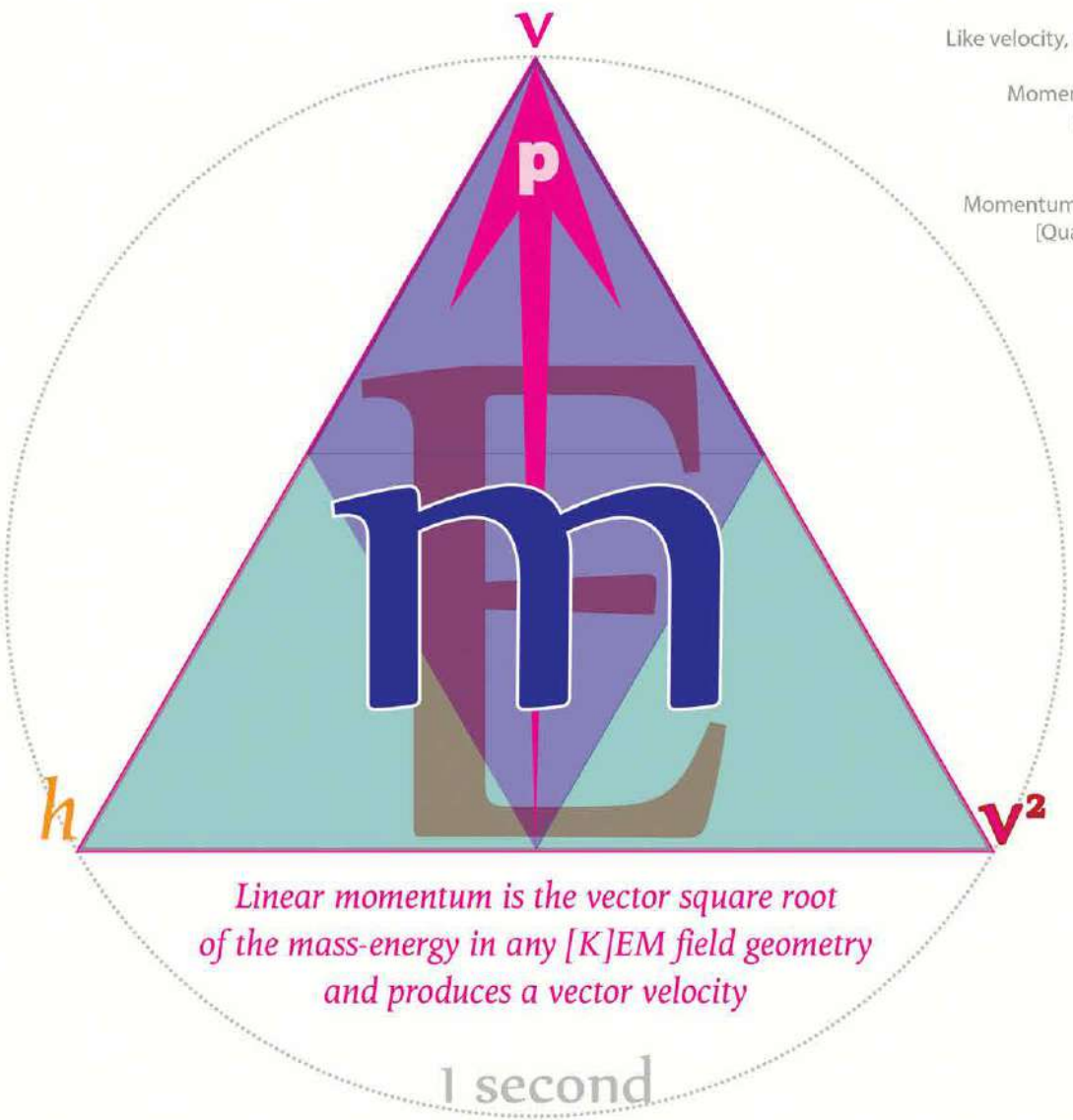
$kg\frac{m}{s}$ linear momentum **p**

In classical mechanics, momentum (pl. momenta; SI unit kg·m/s, or, equivalently, N·s) is the product of the mass and velocity of an object (p).

Like velocity, momentum is a vector quantity, possessing a direction as well as a magnitude.

Momentum is a conserved quantity (law of conservation of linear momentum), meaning that if a closed system is not affected by external forces, its total momentum cannot change.

Momentum should be referred to in its specific forms to distinguish it in its various forms [Quantised Angular, Linear, Rotational and quantum/nuclear momentum]



Linear momentum is the vector square root of the mass-energy in any [K]EM field geometry and produces a vector velocity

$$p = \frac{hv^2}{v} = mv$$

Although originally expressed in Newton's Second Law, the conservation of momentum also holds in special relativity and, with appropriate definitions, a (generalized) momentum conservation law holds in electrodynamics, quantum mechanics, quantum field theory, and general relativity.

In relativistic mechanics, non-relativistic momentum is further multiplied by the Lorentz factor.

$$p^2 = E = mv^2$$

Energy can be expressed as the square of linear momentum

$$kg\frac{m^2}{s^2}$$

equilateral Planck energy momenta

$$m\Omega v^2$$

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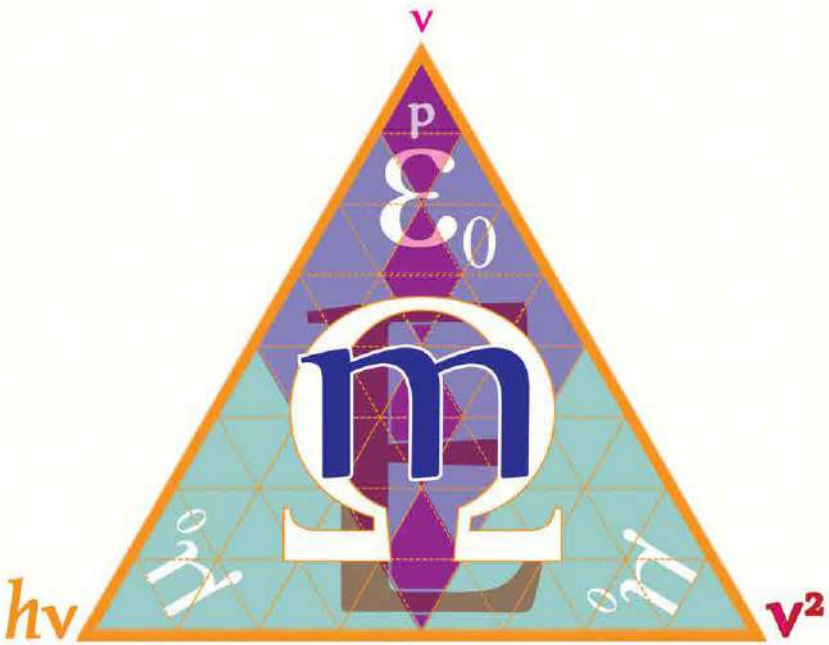
Energy-momentum relationship

The total number of equilateral Planck quanta [quantised mass-energy momenta] is directly related to the square of its linear momentum [mass-velocity]

Quantum Mechanics

$$h = \frac{E}{v^2}$$



Newtonian physics

$$m = \frac{E}{v^2}$$

Quantised energy equilateral momenta

$$hv^2$$

Quantised Energy momenta is related to Scalar mass energy momenta through the equilateral geometry of Planck's constant

Scalar energy linear momentum

$$pv$$

$$m\Omega v^2 = E = mv^2$$

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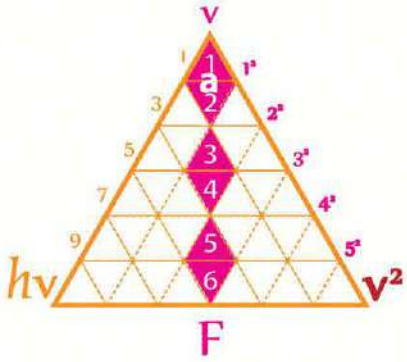
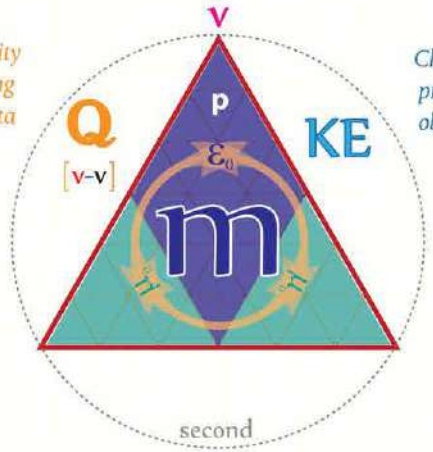
Inertial resistance to Force

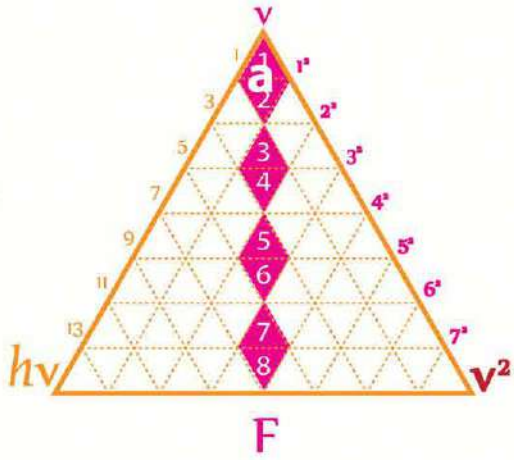
Inertia is the resistance of any physical object to a change in its state of motion.



Changes to mass-velocity require a corresponding change to boson quanta



Changes to mass-velocity produces a change in an object's Kinetic Energies



$$E = mc^2$$

The total intrinsic momenta of all energy waveforms is the sum of their constituent Quantised Angular momenta (mass-energy momenta)

$$M_0 = m/c^2$$

$$KEM = Mv^2$$

Matter in motion has Kinetic Energies in addition to invariant rest mass-Energy

KE = RE - rest Matter

Any change in motion results in changes to the Charge geometries creating in turn proportional changes to KEM mass and momenta components

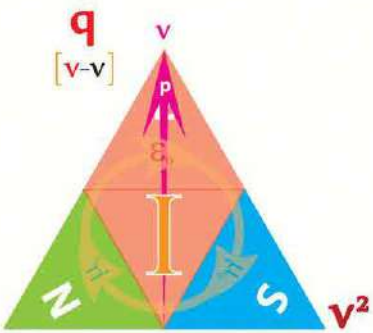
$$F = ma$$

The 'inductive resistance' of Charge quanta fields to changes in their mass-energy momenta content is what we term Inertia

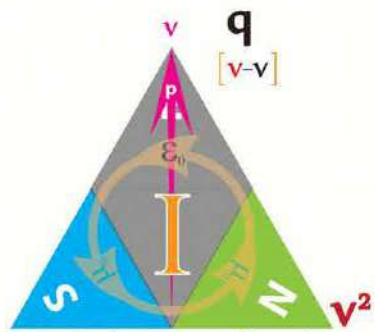
Any change to an object's velocity results in a corresponding change to its mass-Energy momenta which is reflected by its inertia

$$p^2 = E = mv^2$$

Inertial mass can be related to Charge through inductive Planck quanta



quantised moment of inertia



quantised moment of inertia

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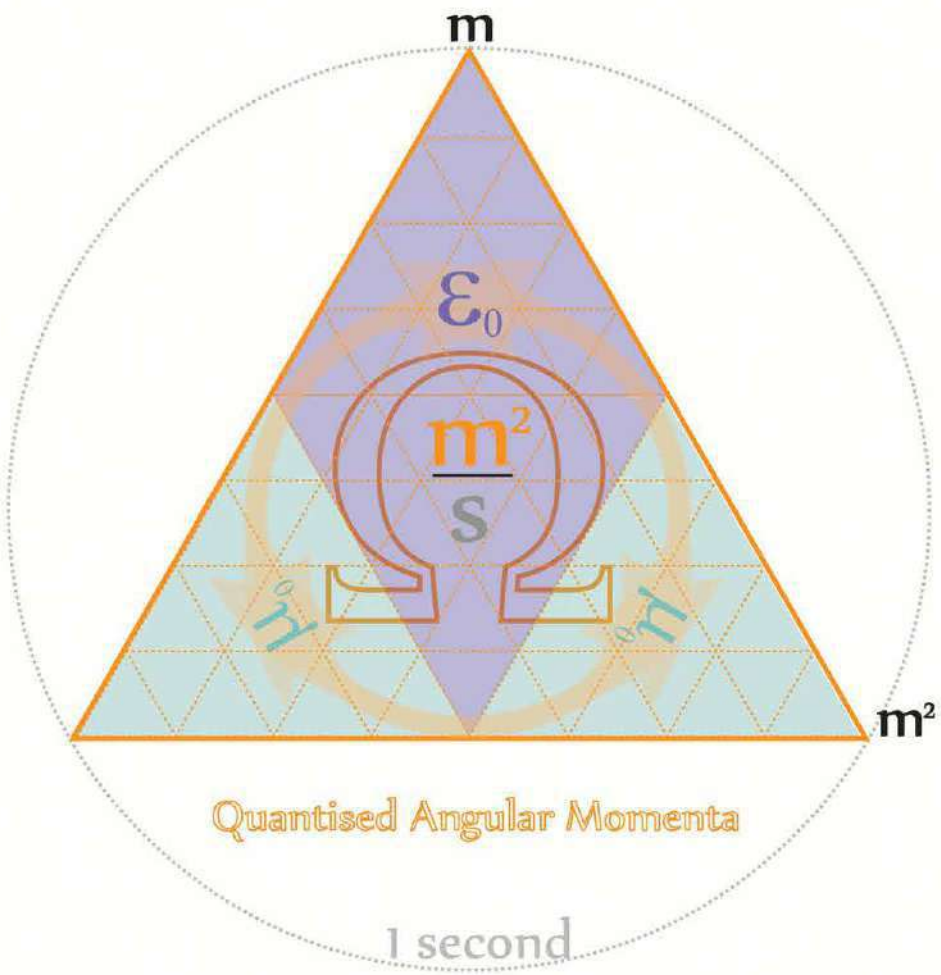
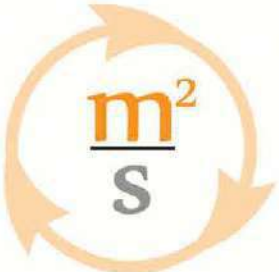
Quantised Angular momentum

As it is a physical [equilateral] geometry QAM is conservative in any system where there are no external Forces and serves as the foundational geometric source for all the conservation laws of physics



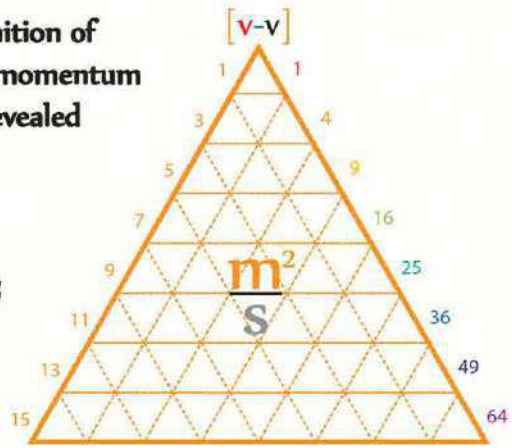
Angular momentum is sometimes described as the rotational analog of linear momentum, in Tetryonics it is revealed to be the equilateral geometry of quantised mass-energy momenta within any defined space-time co-ordinate system

A major re-definition of quantised angular momentum in physics is revealed



classical rotational angular momentum

≈



Quantised Angular momentum

In quantum mechanics, angular momentum is quantised – that is, it cannot vary continuously, but only in ODD number "quantum steps" between the allowed SQUARE nuclear Energy levels

In physics, angular momentum, moment of momentum, or rotational momentum is a conserved vector quantity that can be used to describe the overall state of a physical system.

When applied to specific mass-Energy-Matter systems QAM reveals the true quantum geometry and nature of Energy in our universe

h

$kg\frac{m^2}{s}$

$m\Omega$

mass x QAM

Planck's Constant

Normally viewed as an expression of rotational momentum Quantised Angular Momentum [QAM] is in fact a result of the equilateral geometric quantization of mass-energy

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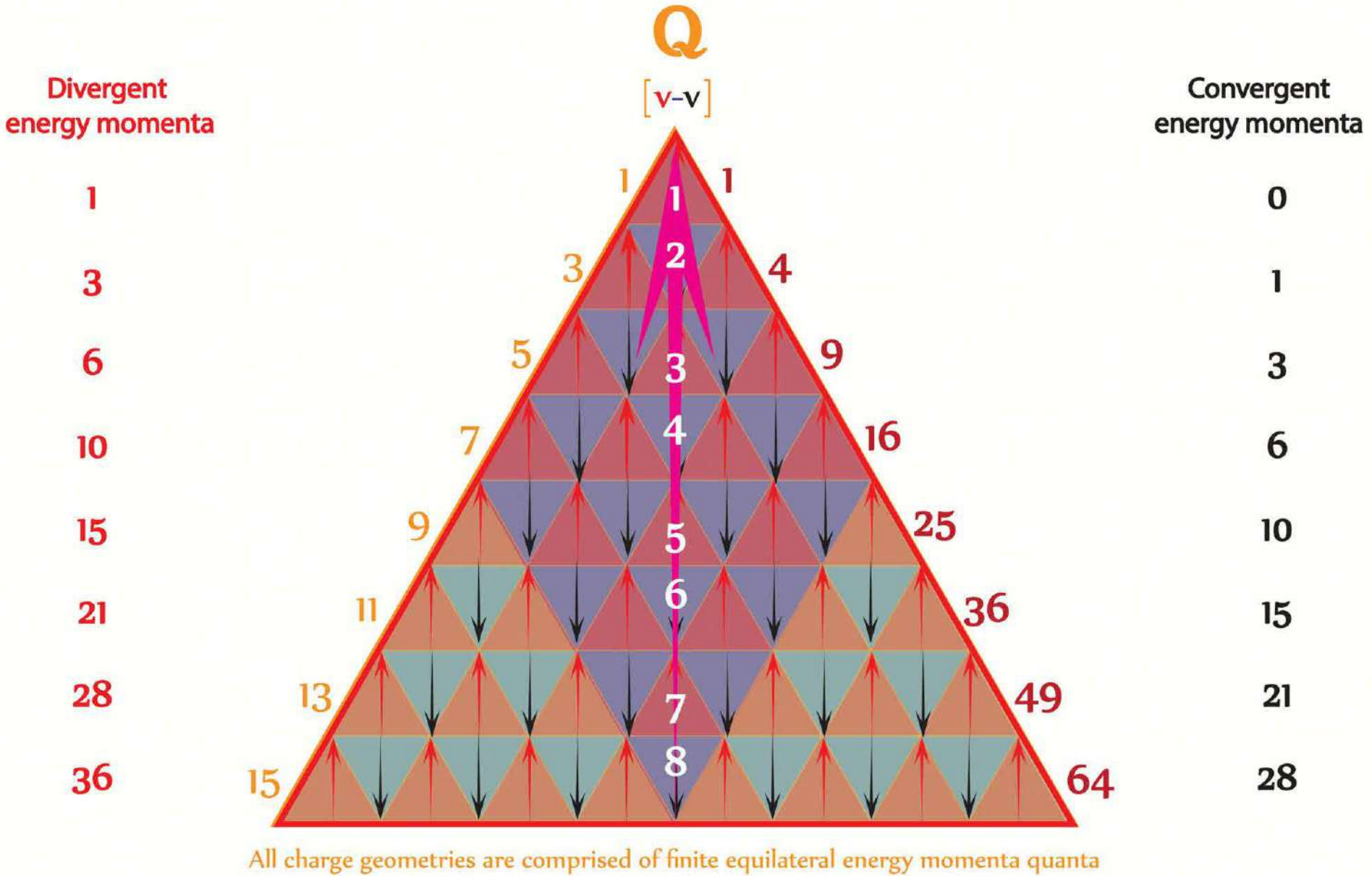
Charged geometries

All charge geometries are nett divergent



All charge geometries are comprised of finite equilateral energy momenta quanta

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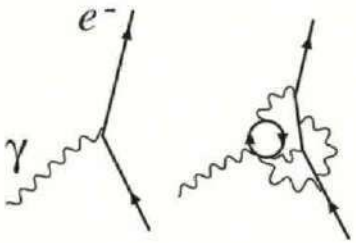
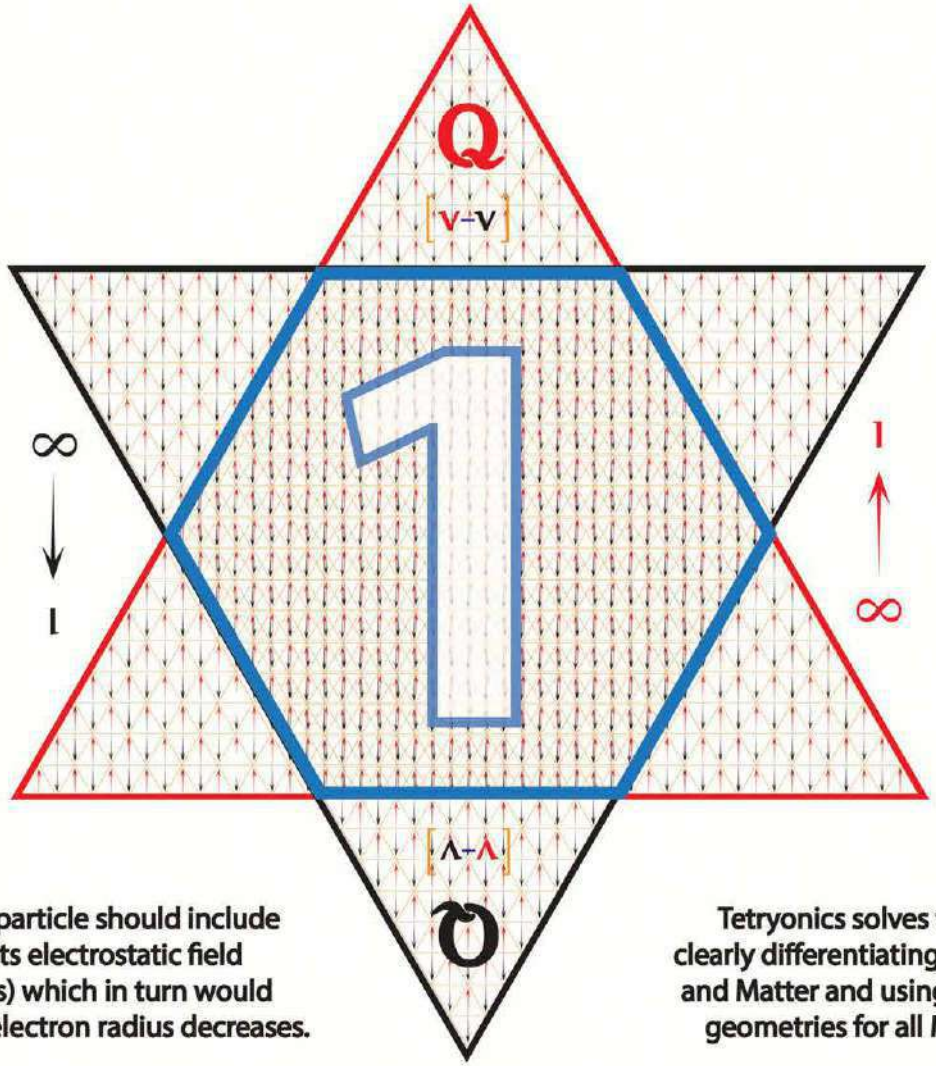
Renormalisation

Renormalization was first developed in quantum electrodynamics (QED) to make sense of infinite integrals in perturbation theory.
The problem of infinities first arose in the classical electrodynamics of point particles in the19th and later in the calculation of Gravitational fields in General Relativity in the early 20th century.

In QED Infinities must be cancelled





In Tetryonics Infinities do not exist

The mass of a charged particle should include the mass-energy in its electrostatic field (Electromagnetic mass) which in turn would approach infinity as the electron radius decreases.

Tetryonics solves the problem by clearly differentiating between EM mass and Matter and using finite equilateral geometries for all Matter in motion

Initially viewed as a suspicious provisional procedure by some of its originators, renormalization was eventually embraced as an important and self-consistent tool in several fields of physics and mathematics.

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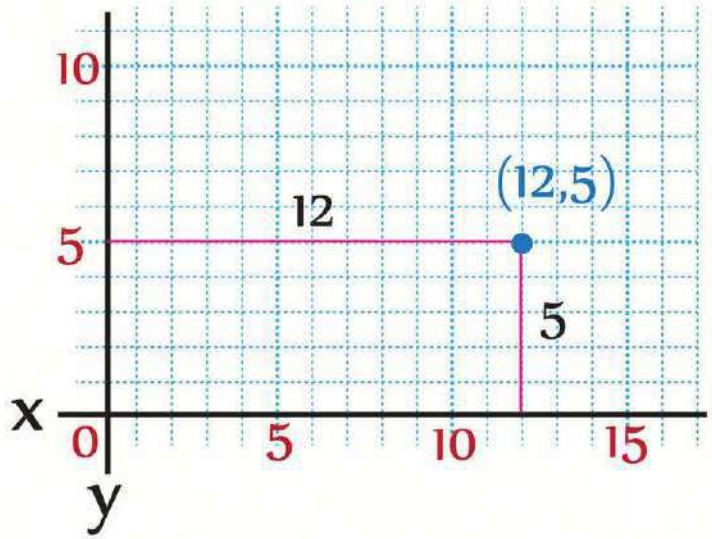
2D space [c^2]

The adjective Cartesian refers to the French mathematician and philosopher René Descartes who developed the coordinate system in 1637

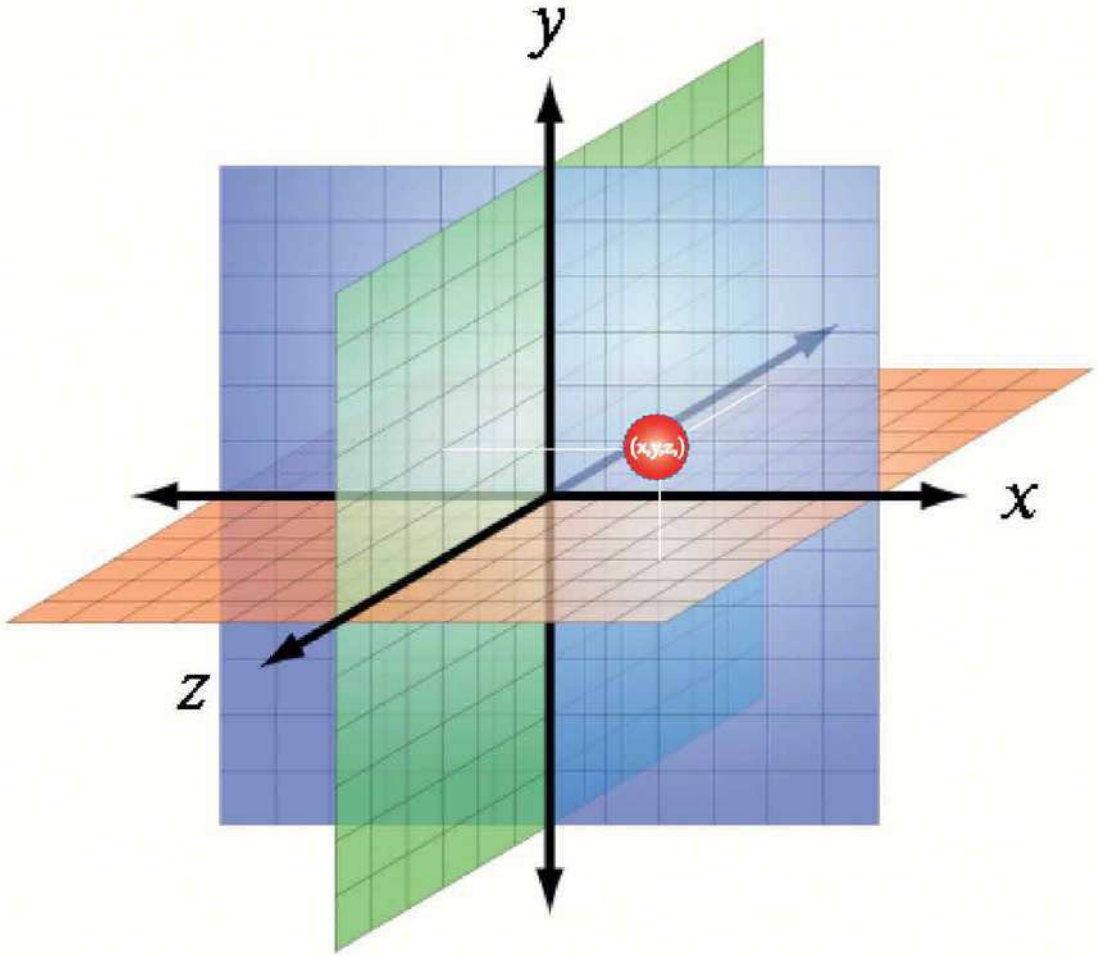
Since then many other coordinate systems have been developed such as the polar coordinates for the plane, and the spherical and cylindrical coordinates for three-dimensional space.



Cartesian coordinates are the foundation of analytic geometry, and provide enlightening geometric interpretations for many other branches of mathematics, such as linear algebra, complex analysis, differential geometry, multivariate calculus, group theory, and more

Mapping 3D spaces using Recti-linear co-ordinates

Cartesian coordinates can be defined as the positions of the perpendicular projections of a point onto the two or more axes, expressed as signed distances from the origin.



3D Cartesian co-ordinate [c^3] systems are distinct from spherical co-ordinate [c^4] systems

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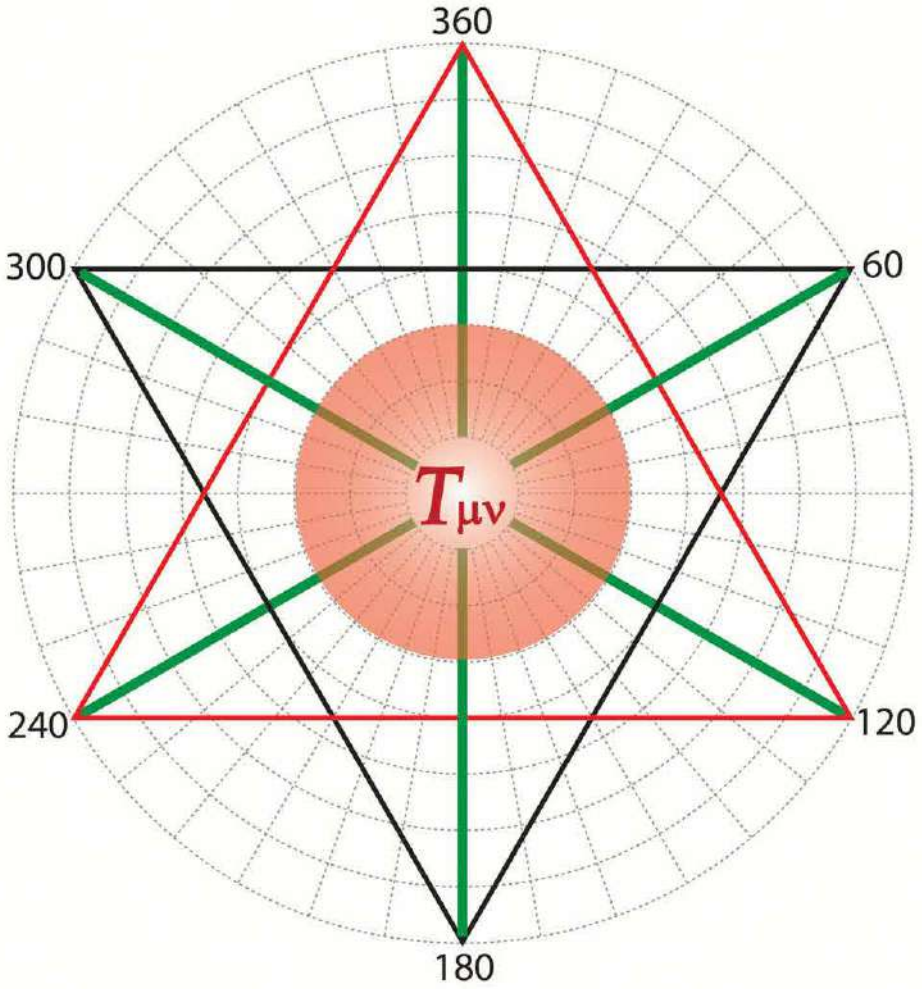
Polar co-ordinates

In mathematics, the polar coordinate system is a two-dimensional co-ordinate system in which each point on a plane is determined by a distance from a fixed point and an angle from a fixed direction.

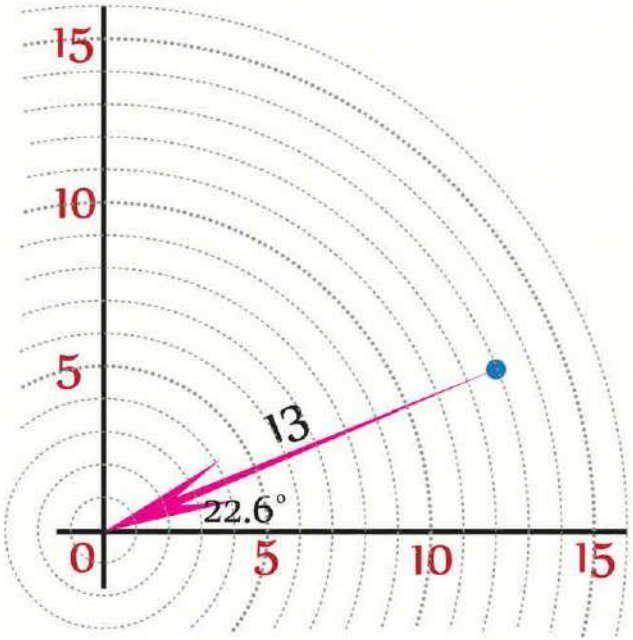


In geometry, curvilinear coordinates are a coordinate system for Euclidean space in which the co-ordinate lines may be curved.

Action Dynamics

Curvilinear co-ordinates may be derived from a set of rectilinear Cartesian coordinates by using a locally invertible transformation that maps one point to another in both systems

Metric Tensors



Gravitational acceleration

Polar or curvilinear co-ordinate systems are used extensively by Einstein in his theory of General Relavtivity

Reimannian curved space-time

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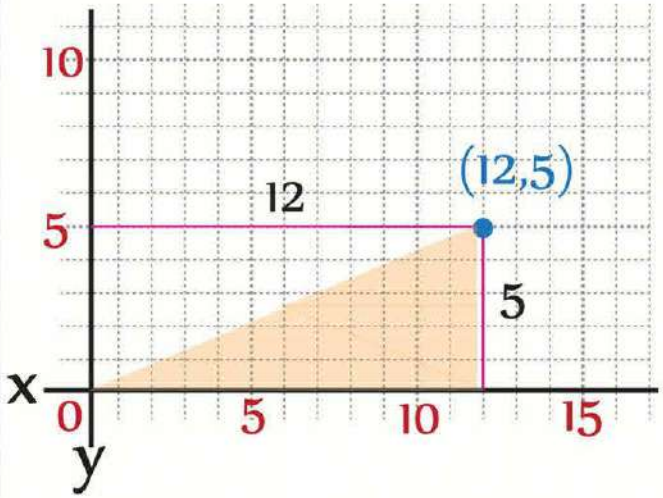
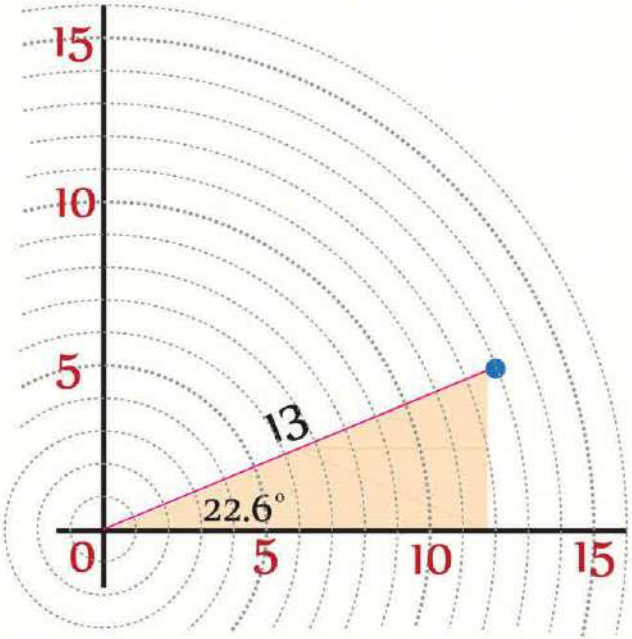
Co-ordinate transformations

There are many different possible coordinate systems for describing geometrical figures and they can all be related to one another.

Such relations are described by coordinate transformations which give formulas for the coordinates in one system in terms of the coordinates in another system



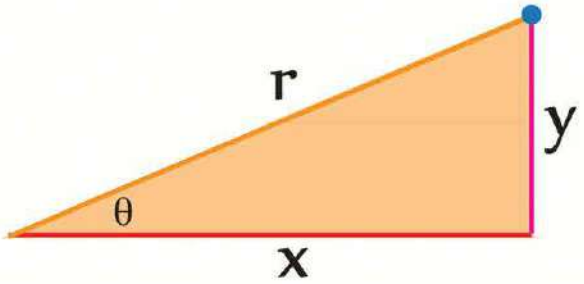
Converting between Polar and Cartesian coordinates



$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$= \tan^{-1}(5/12)$$

$$= 22.619$$



$$r^2 = 12^2 + 5^2$$

$$= \sqrt{169}$$

$$= 13$$

solving for the triangle using trigometric functions

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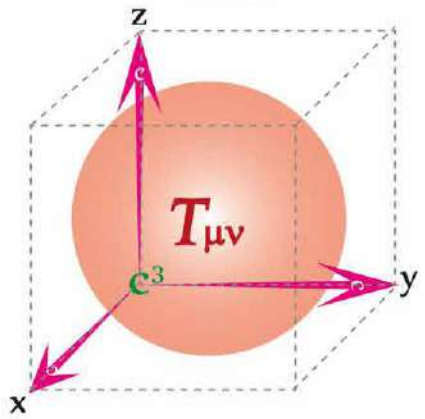
Spatial co-ordinate systems

Cubic

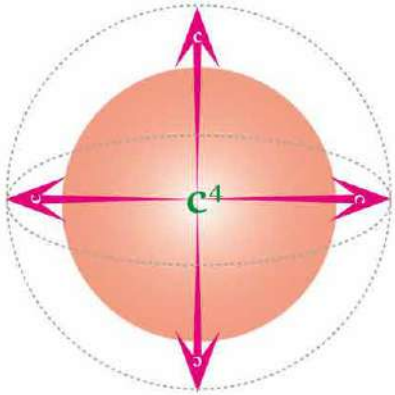


Spacetime is any mathematical co-ordinate system or model that combines space and time into a single continuum.

Spacetime is usually interpreted with space as being three-dimensional with time playing the role of a fourth dimension that is different from the spatial dimensions.

From a Euclidean space perspective, the universe has three spatial dimensions and one dimension of time [reflected by quantised angular momentum].

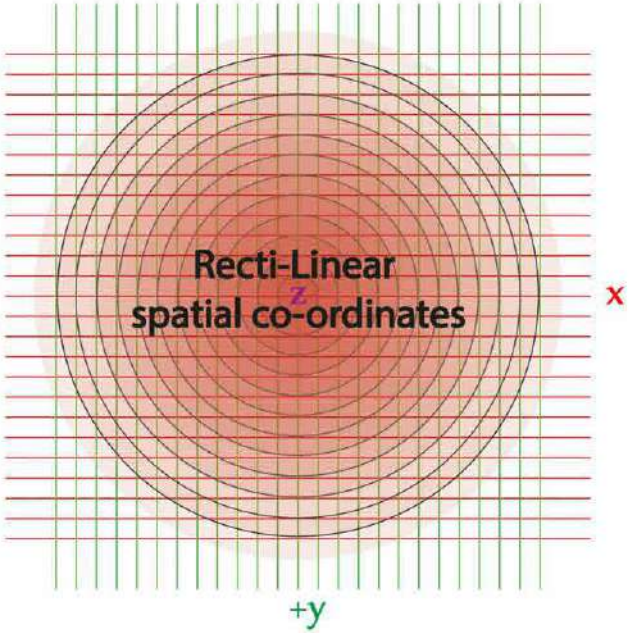
Spherical

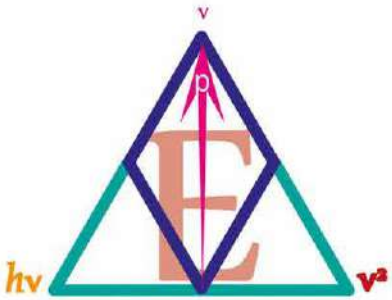


seconds^2

Tetryonics maps spatial co-ordinates through the momenta vectors of equilateral Energy

Cartesian Space-Time

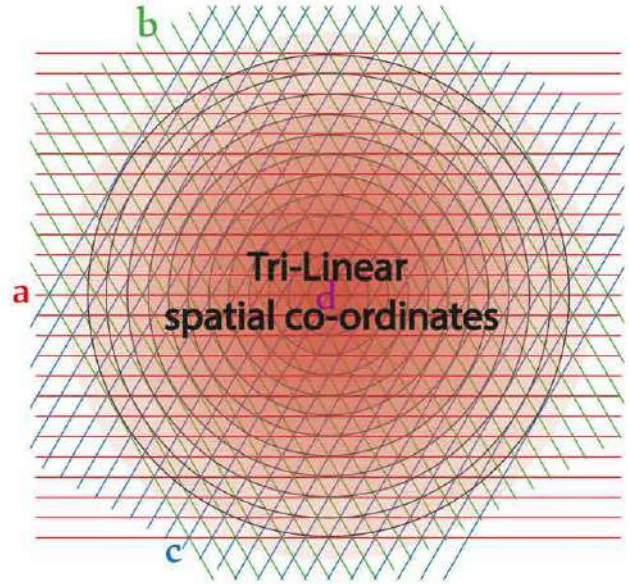




EM mass-ENERGY momenta are equilateral geometries

Mapping equilateral Energy geometries onto recti or curvi-linear spatial co-ordinate systems introduces mathematical complexity to a otherwise simplistic geometry for all EM mass-Energy-Matter interactions

Tetryonic Space-Time



In physics spatial co-ordinates to date have been based on Cartesian co-ordinates when in fact Energy momenta follow a Tri-Linear co-ordinate geometry

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vectors

1 Dimensional velocity

Euclidean

2 Dimensions velocity squared

$$m = \frac{E}{c^2}$$

mass-energy equivalence

mass-Matter

$$\frac{m}{c^2} = M$$

equivalence

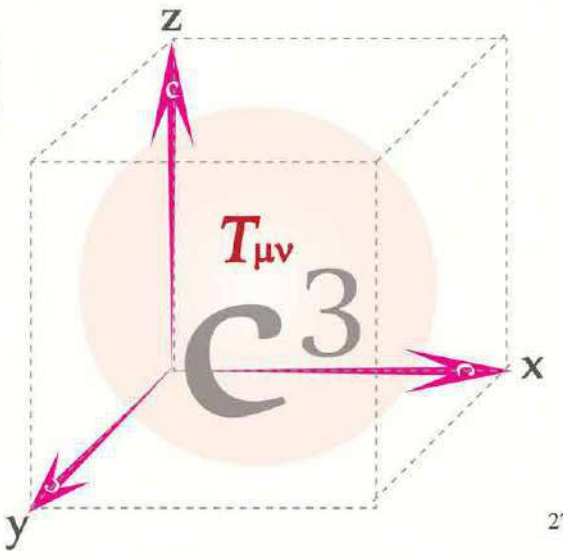
$$T_{\mu\nu}$$

energy-Matter equivalence

$$M = \frac{E}{c^4}$$

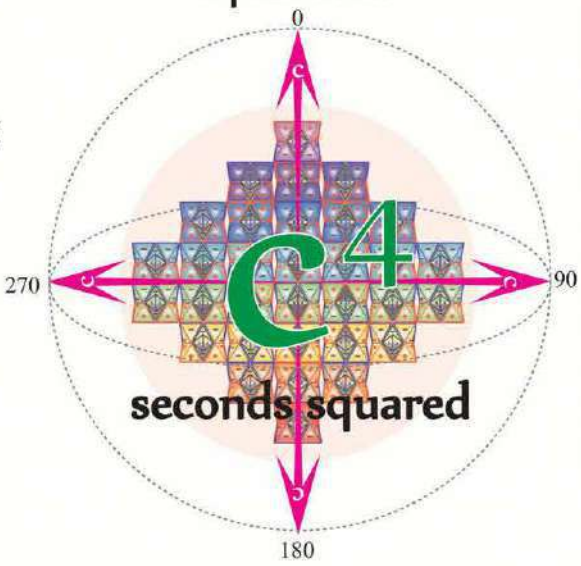
GR fails differentiate betweem EM mass-ENERGY-Matter unlike Tetryonic theory

Cartesian co-ordinates



3 Dimensions velocity cubed

Spherical



3 Dimensions quadrature velocity

Space-time co-ordinates

The propagation of Energy momenta forms distinct spatial co-ordinate systems

Where angles are typically measured in degrees (°) or radians (rad), where 360° = 2π rad = τ radians.

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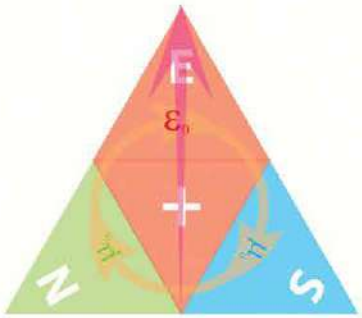
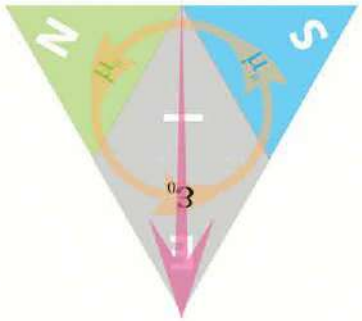
Tetryonic co-ordinate systems

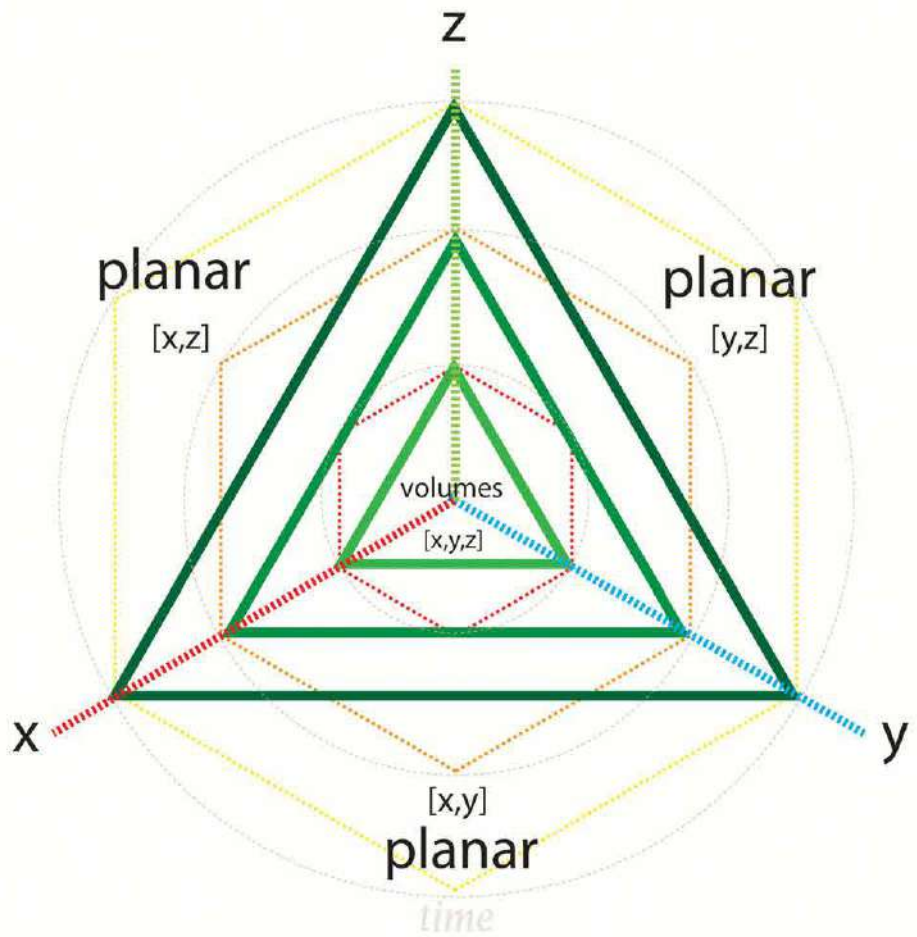
Energy per second

m



2D mass-energy geometries





Energy per second squared

M

Proton

3D Matter topologies

Neutron

Planar mass-energy geometries have no z-components

Differentiation between 2D mass-energy & 3D Matter is key to extending our understanding of physics

Matter topologies have z-components

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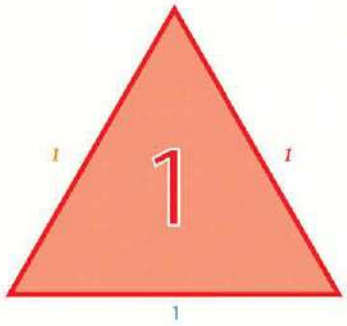
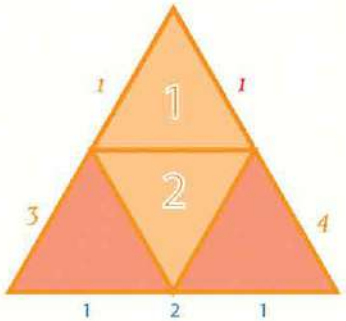
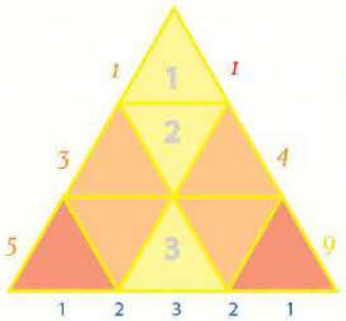
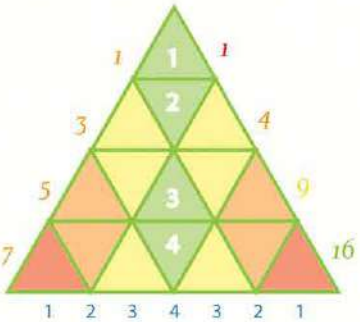
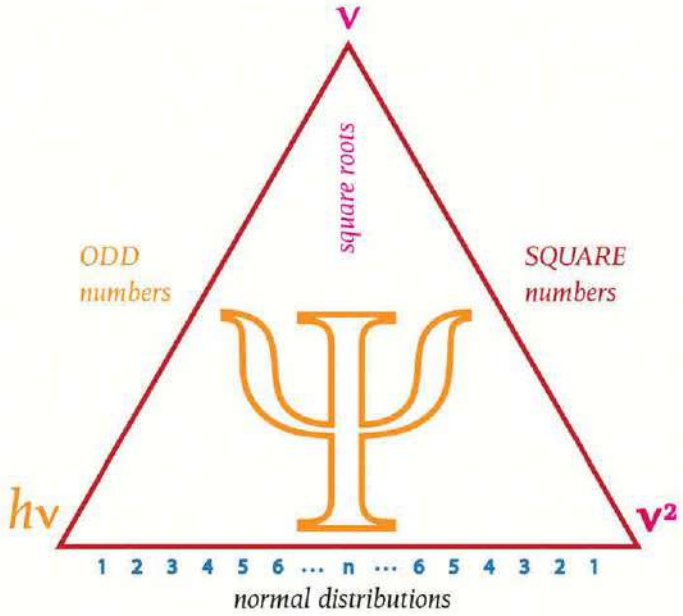




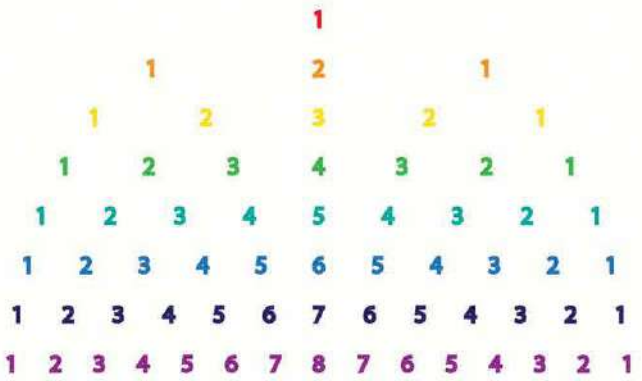




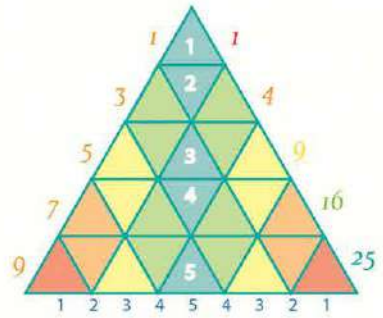


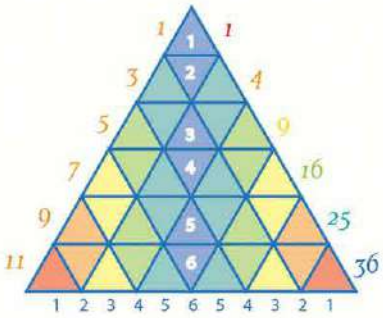
Quantum probability distributions

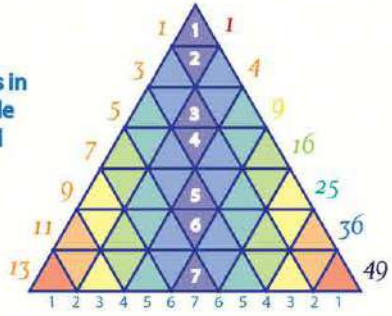
The equilateral geometry and distribution of quantised Energy momenta provides the basis for all statistical probabilities in Quantum mechanics, thermodynamic & Information entropy - including a solution to Heisenberg's Uncertainty Principle thus paving the way forward for a new understanding, and manipulation of physical phenomena at the quantum level

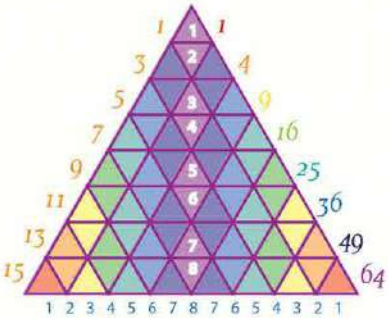


Normal distributions are extremely important in statistics, and are often used in the natural and social sciences for real-valued random variables whose distributions are not known









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Quantum Probability Distributions

The normal distribution is a probability distribution.
It is also called Gaussian distribution because it was discovered by Carl Friedrich Gauss.

x/n^2

Probabilities are the square of the Amplitude

n

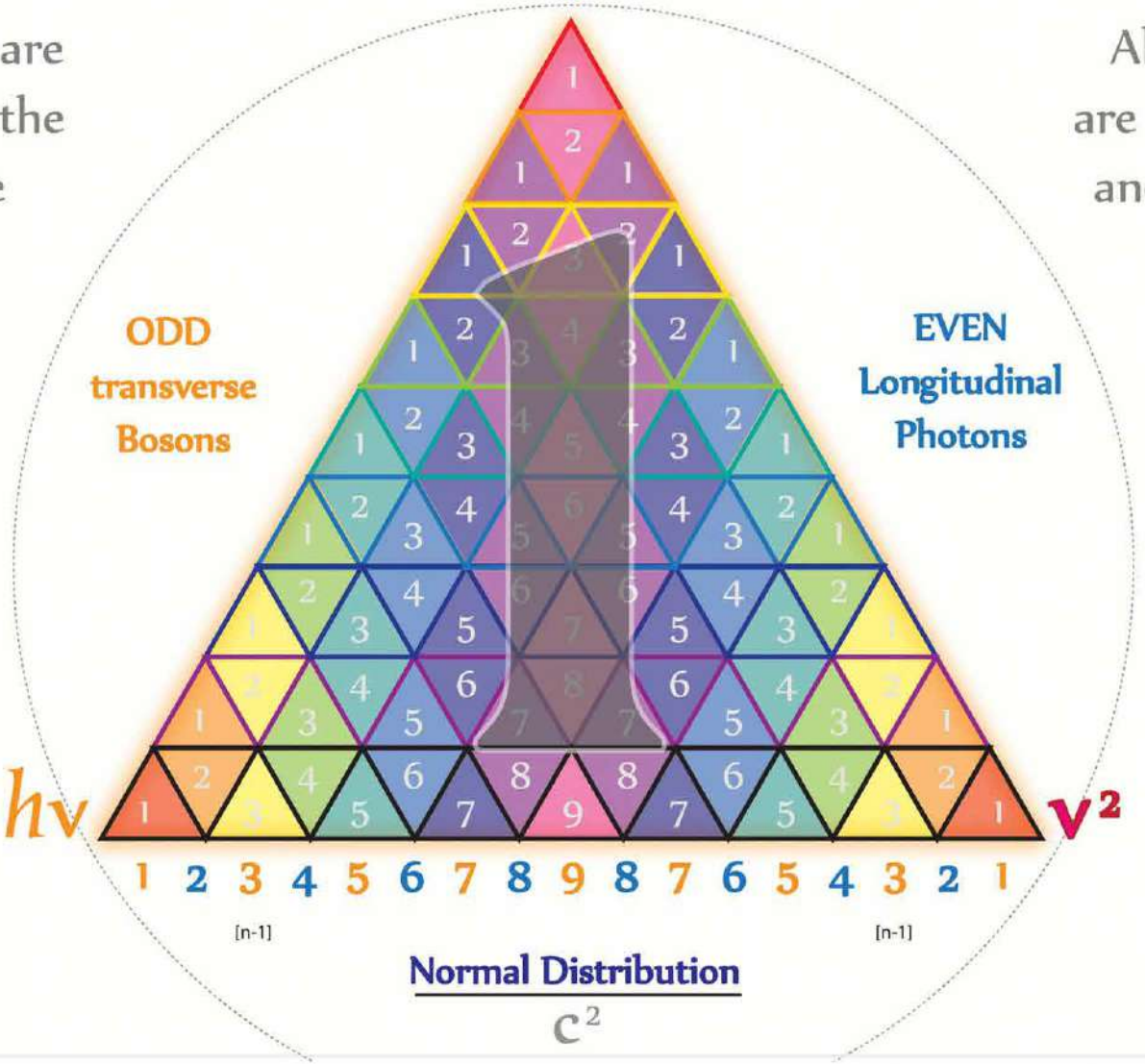
square root momenta

v

$\Sigma\ x/n^2$

All probabilities are re-normalisable and sum to Unity

1



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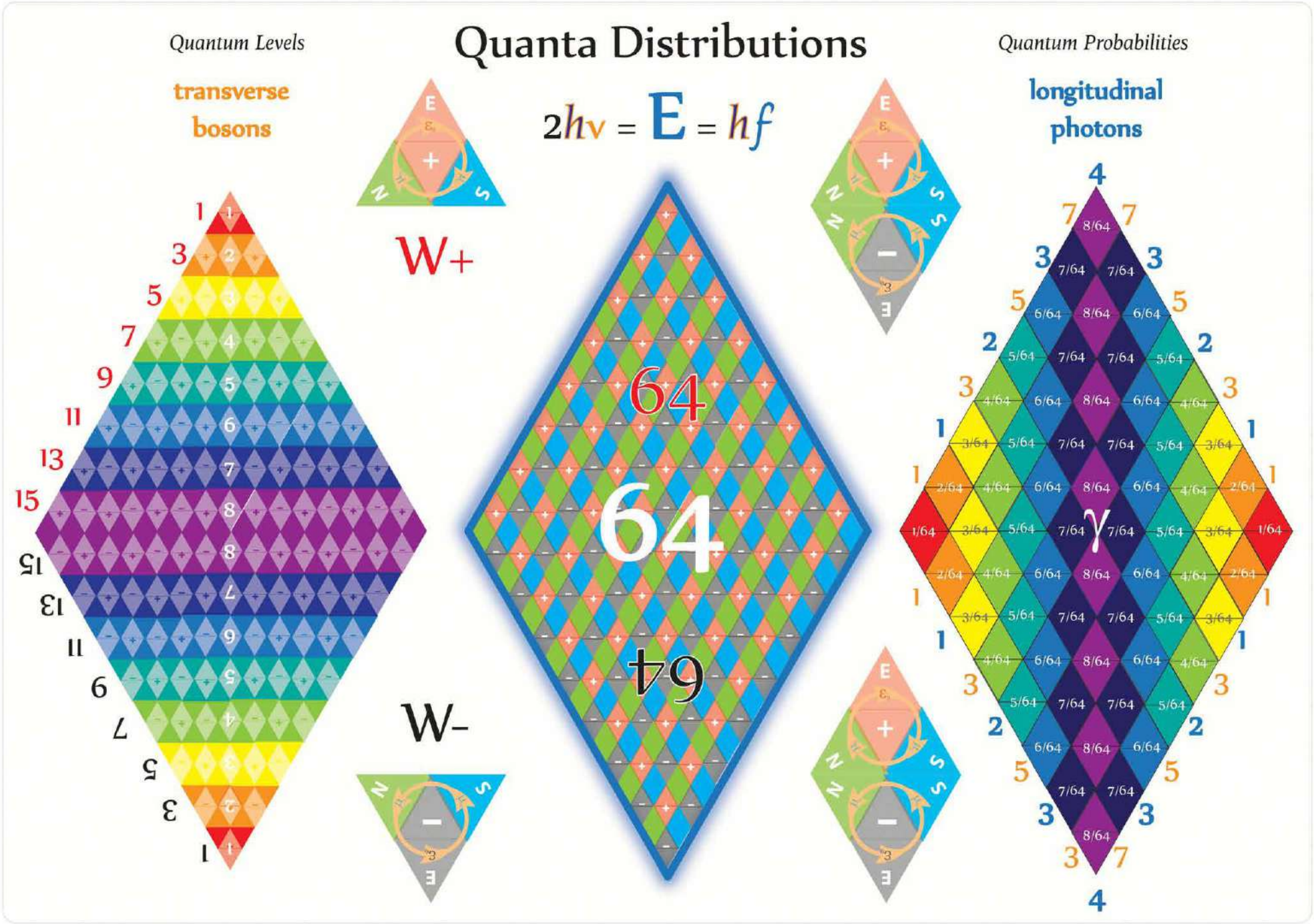

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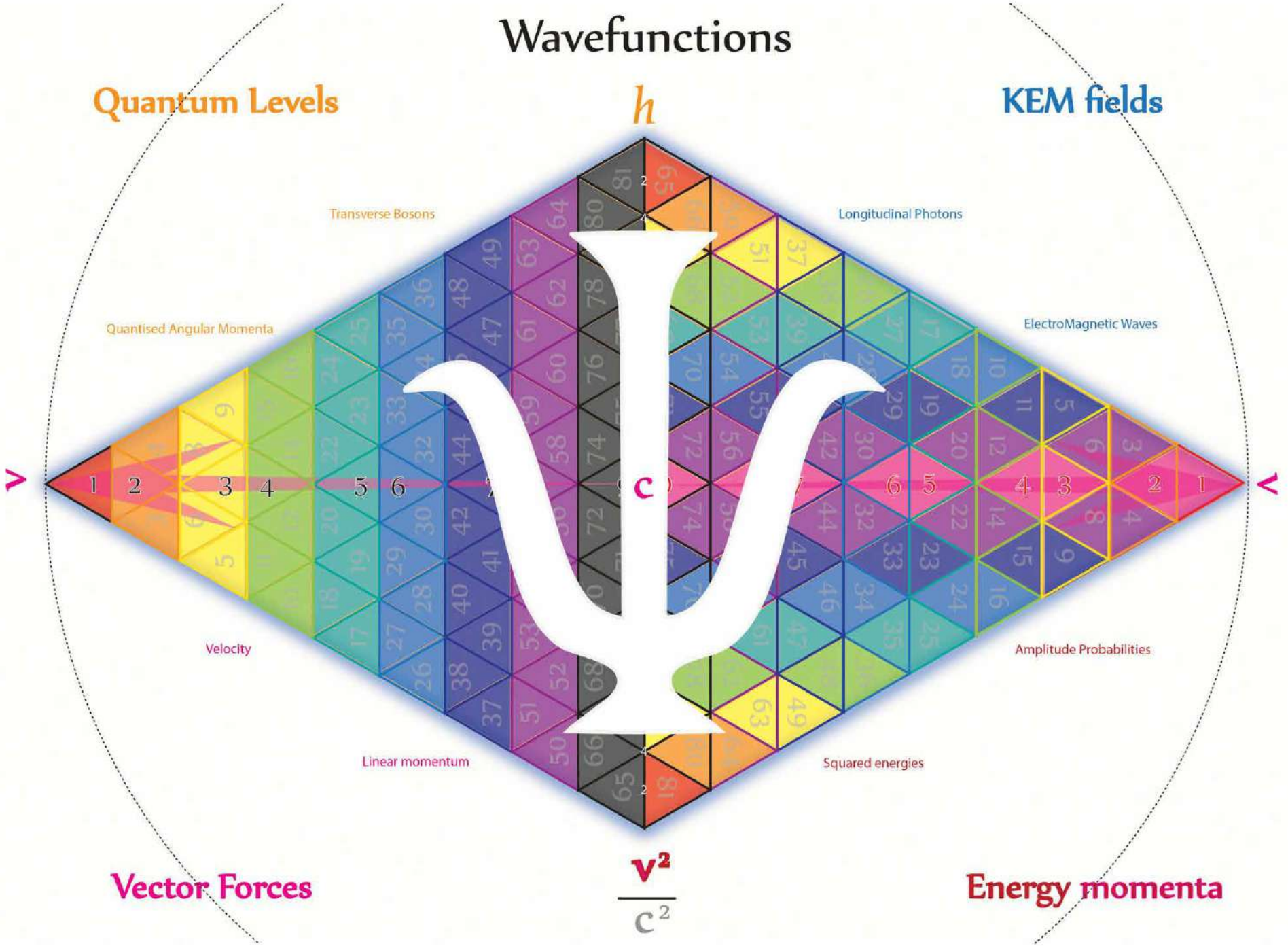
Wavefunctions



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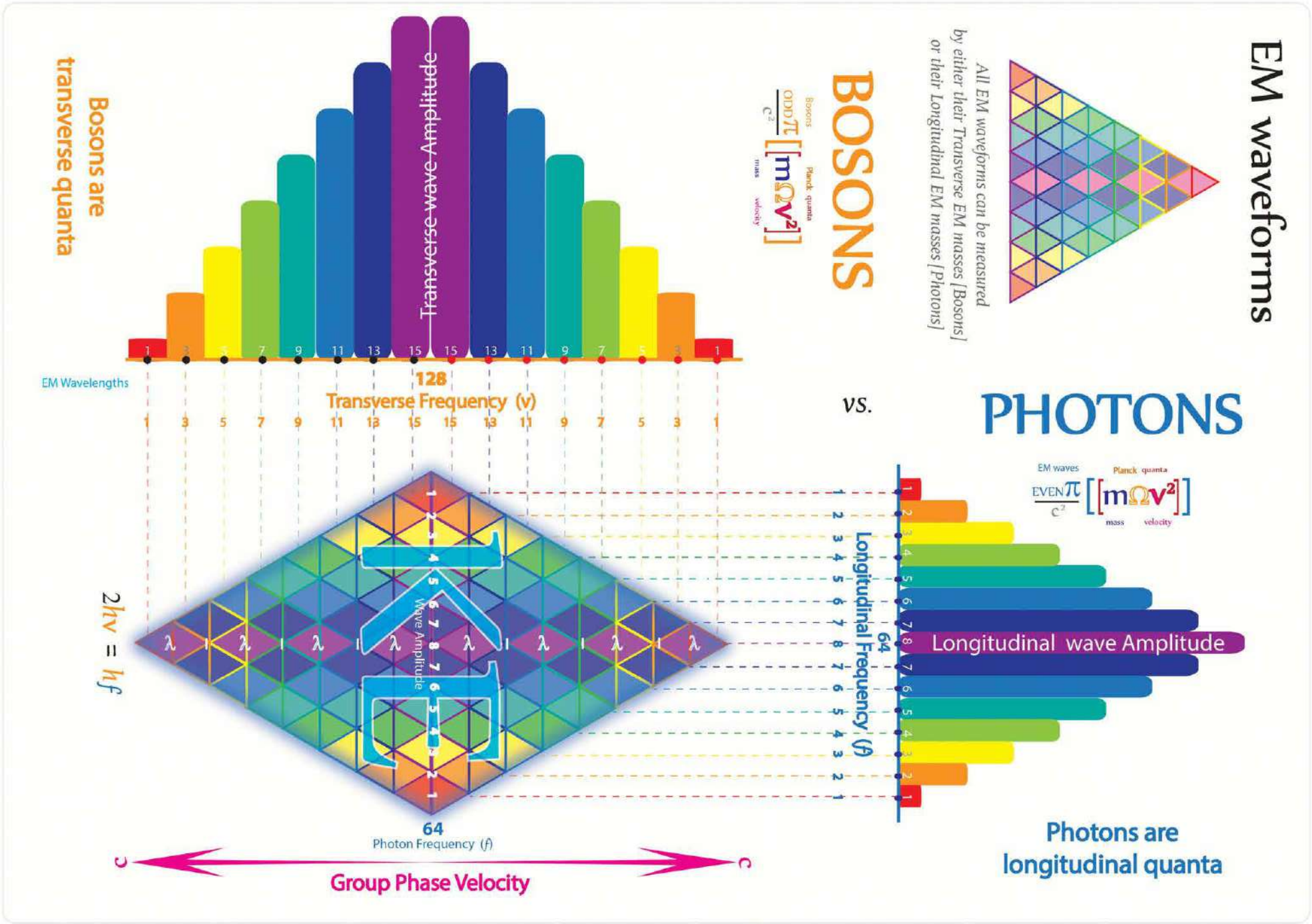

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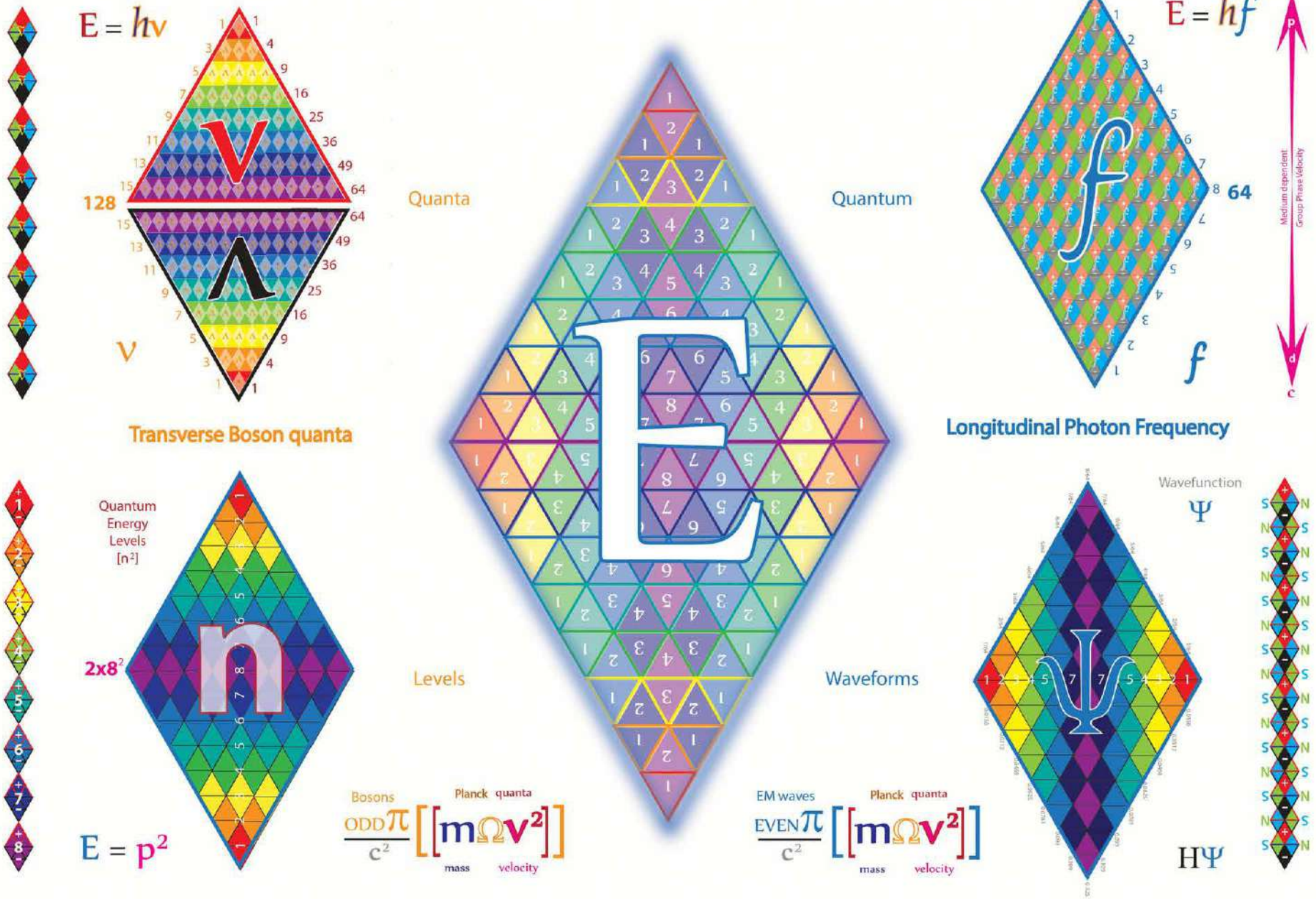
Quantum Energy distributions



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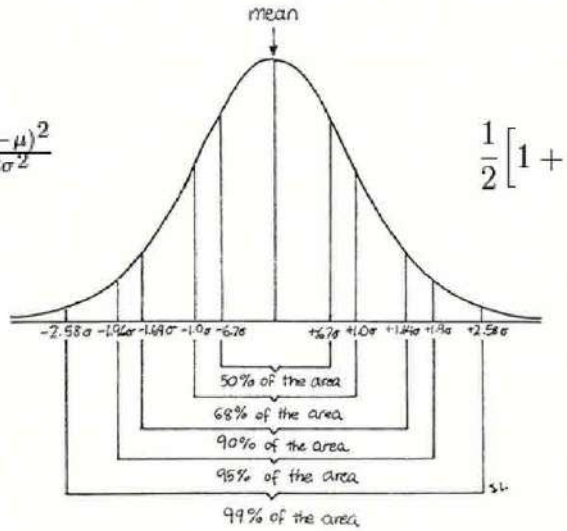
Normal Distributions

The Gaussian distribution sometimes informally called the bell curve.

Pierre de Fermat

Pierre de Fermat is given credit for early developments that led to infinitesimal calculus.

$$\frac{1}{\sqrt{2\pi\sigma^2}}\, e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$



$$\frac{1}{2}\left[1 + \operatorname{erf}\left(\frac{x-\mu}{\sqrt{2\sigma^2}}\right)\right]$$

Leonhard Euler

Leonhard Euler developed a formula which links complex exponentiation with trigonometric functions

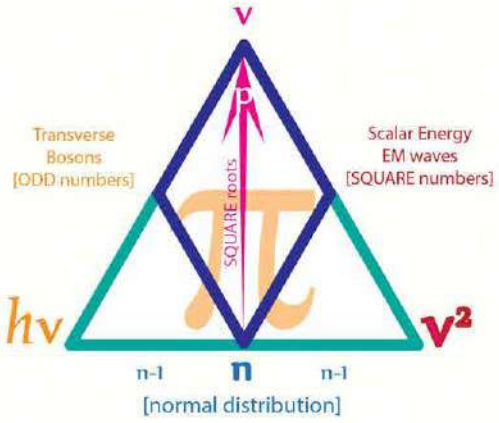
A bell shaped curve defines the standard normal distribution, in which the probability of observing a point is greatest near the average, and declines rapidly as one moves away from the mean.

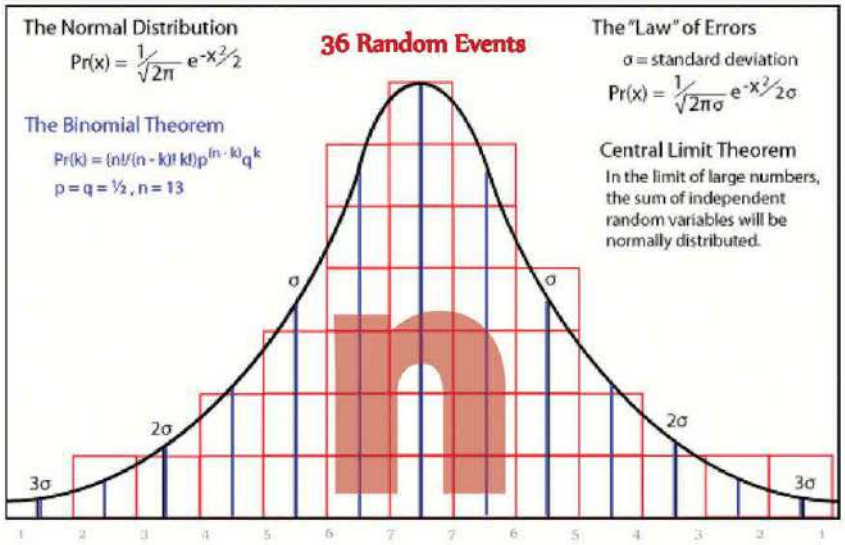
all ODD numbers are

$$a^2 - b^2 = [a-b].[a+b]$$

the difference of two squares

$$e^{i\pi} = -1$$




The Normal Distribution
Pr(x) = 1/√2π e^-x²/2
36 Random Events
The "Law" of Errors
σ = standard deviation
Pr(x) = 1/√2πσ e^-x²/2σ
The Binomial Theorem
Pr(k) = (n!/(n - k)! k!)p^(n-k)q^k
p = q = ½, n = 13
Central Limit Theorem
In the limit of large numbers, the sum of independent random variables will be normally distributed.
σ
2σ
3σ

In probability theory, the normal (or Gaussian) distribution is a continuous probability distribution that has a bell-shaped probability density function, known as the Gaussian function

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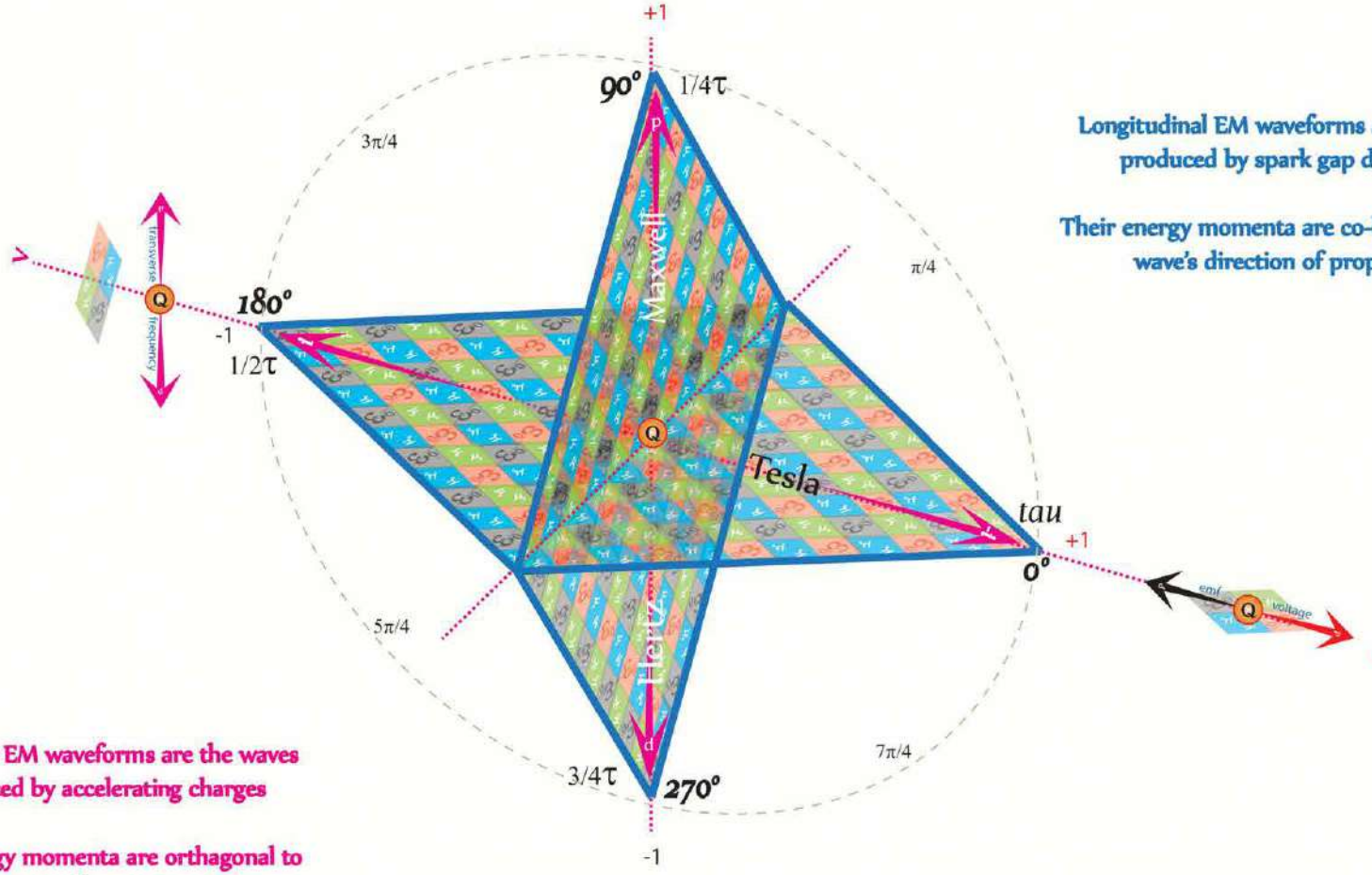
Fundamental theorem of Energy momenta

A nth level scalar energy momenta waveform has exactly n linear momentum in unit circle co-ordinate systems
(with Longitudinal and Transverse equilateral Planck waveforms being orthogonal to each other)

scalar energies

E

mv^2



Longitudinal EM waveforms are the waves produced by spark gap discharges

Their energy momenta are co-linear with the wave's direction of propagation

Transverse EM waveforms are the waves produced by accelerating charges

Their energy momenta are orthagonal to the direction of wave propagation

p

mv

linear momentum

[Mathematics] i or j [Electrical theory]

square root of negative one

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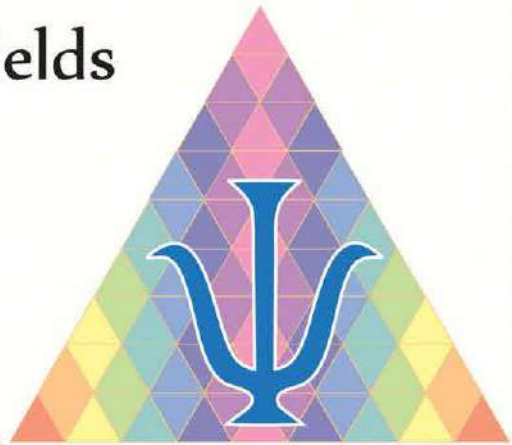
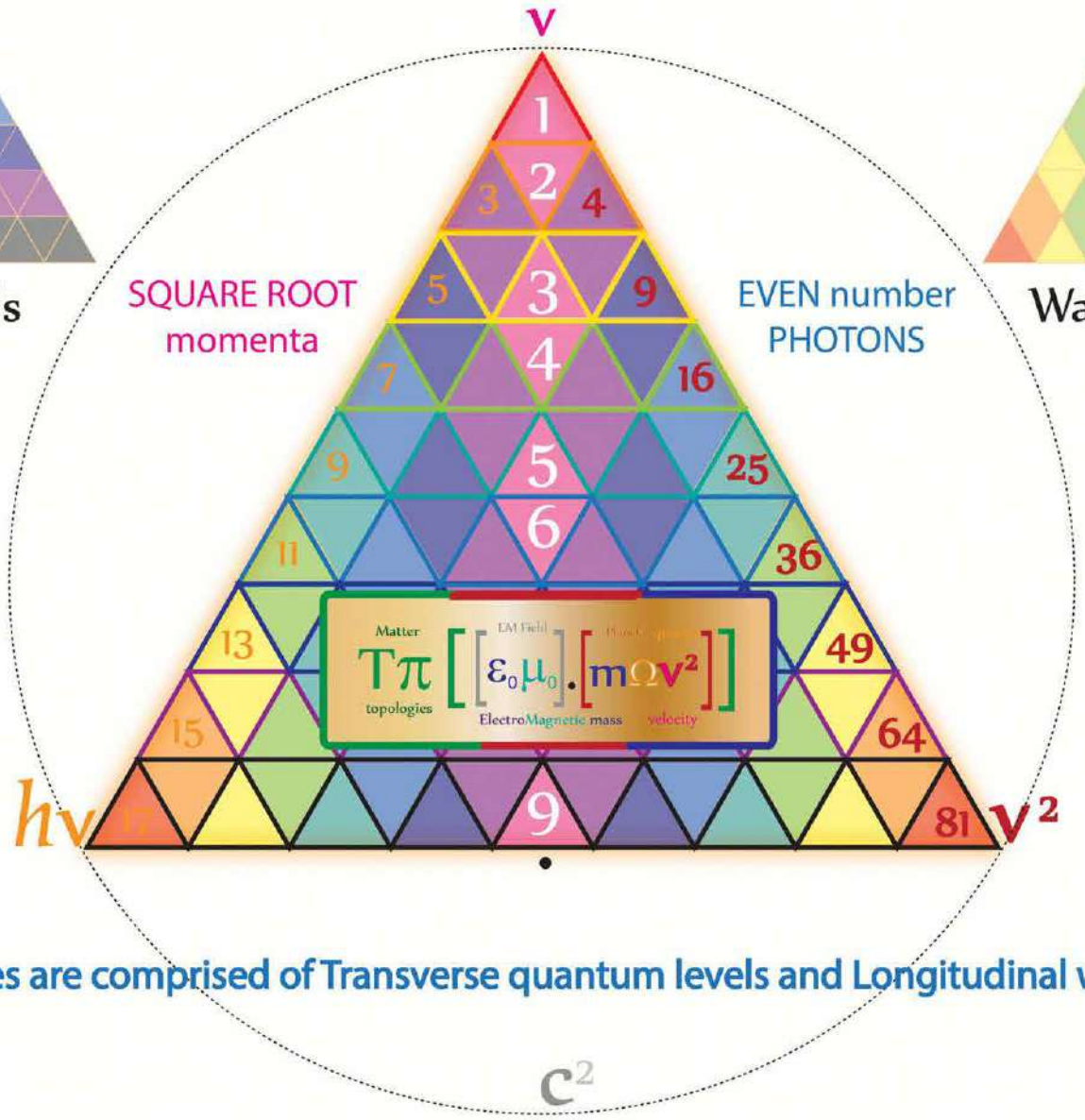
Velocity and Time dependent EM fields

Quantum levels



Wave probabilities



SQUARE ROOT momenta

EVEN number PHOTONS

ODD number BOSONS

SQUARE number ENERGIES

All EM geometries are comprised of Transverse quantum levels and Longitudinal wave probabilities

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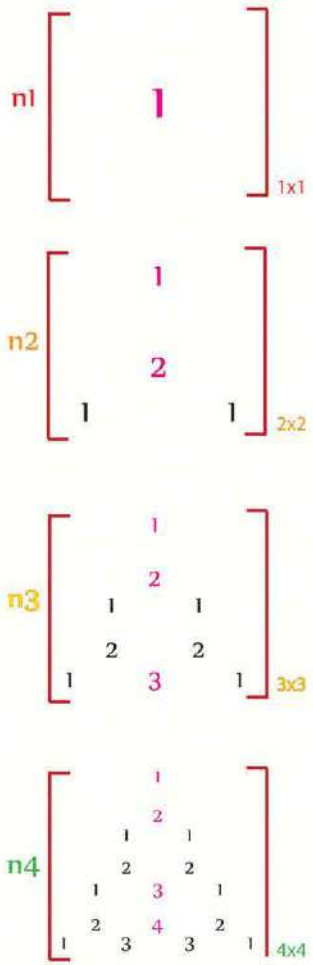
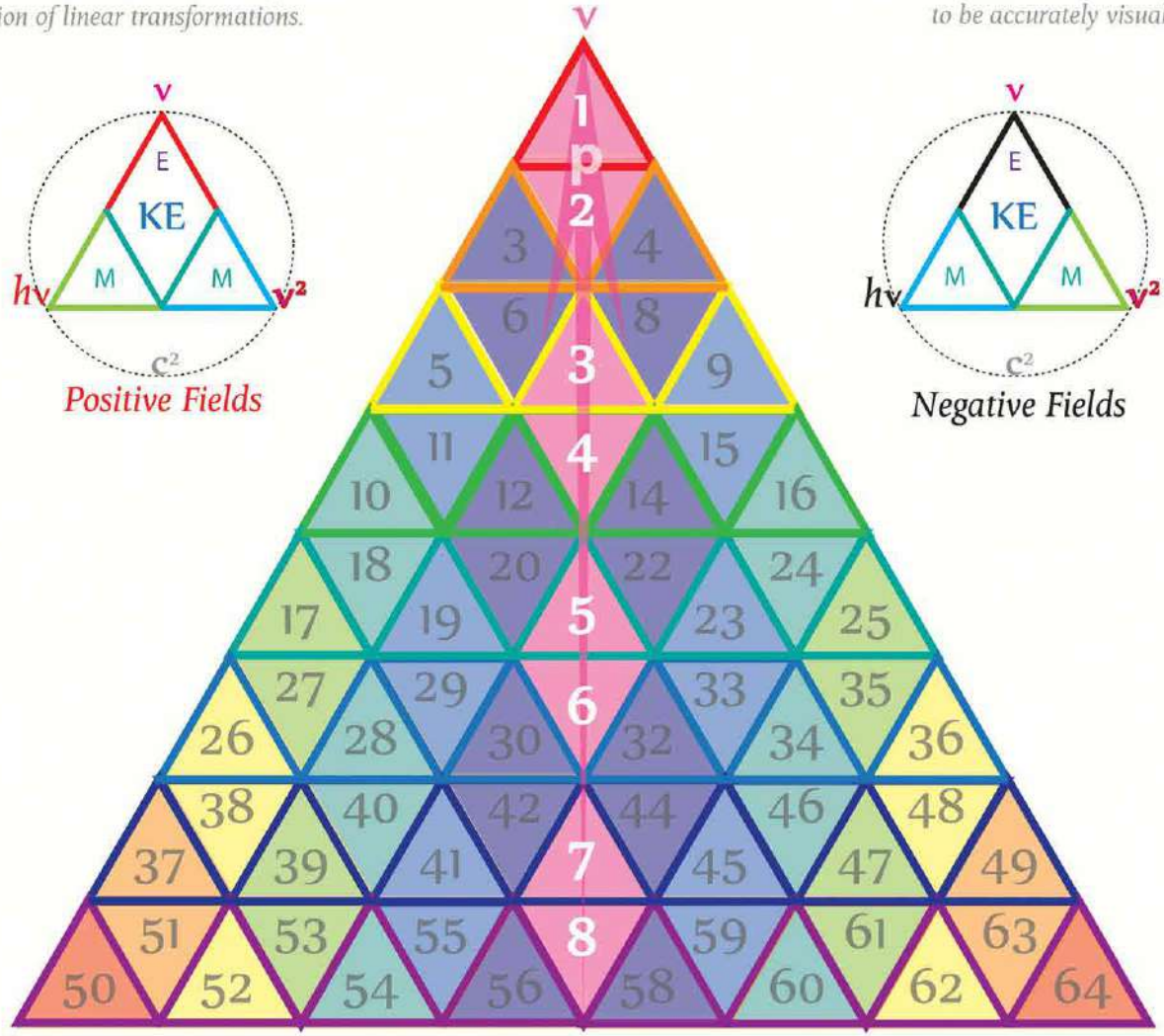
Matrices

Matrices are a key tool in linear algebra. One use of matrices is to represent linear transformations, which are higher-dimensional analogs of linear functions of the form f(x) = cx, where c is a constant; matrix multiplication corresponds to composition of linear transformations.

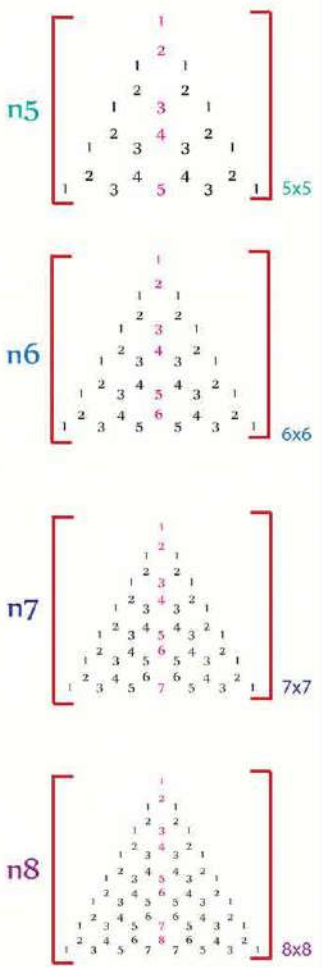
Further developing equilateral Matrices and tensor mathematics to reflect the 2D geometry of EM , KEM and GEM quantum fields, along with the geometric quantisation of mass-energiy momenta and their energy distributions allows for field interactions to be accurately visualised and modelled



Positive Fields



Negative Fields



Tensors are geometric entities introduced into mathematics and physics to extend the notion of scalars, geometric vectors, and matrices to increasingly higher orders.

Modifying Square matrices to reflect the equialteral geometries of Tetryonic fields allows for the accurate geometric modelling of all Scalar & Vector fields along with their varied intrinsic quantum energies and physical properties

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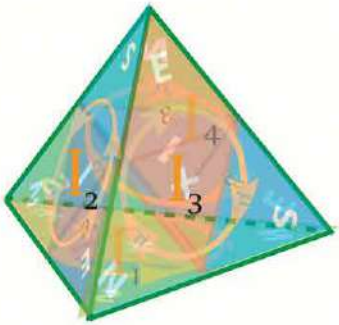
Energy momenta Tensors

momenta
(a property of Energy)
is converative



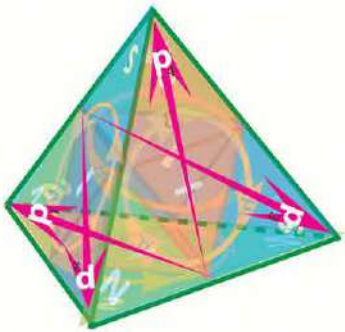
$p_M \rightarrow (E, p1, p2, p3, p4).$

All standing-wave Matter topologies can be modelled using its Tetryonic charge energy momenta Tensors

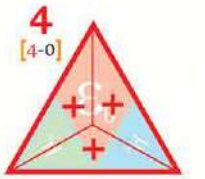
with an additional Kinetic EM energy-momenta tensor required for Matter in motion

$p_{KEM} \rightarrow (E, p5).$

Matter
(a geometric property)
is NOT conservative



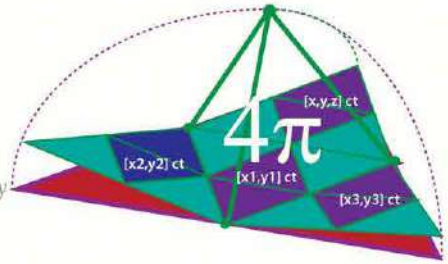
2D+1 [SR] mass-energy momenta can be folded into 3D+1 [GR] Matter
that can be modelled using 4 Energy-momenta tensors



Positive standing-wave
Matter

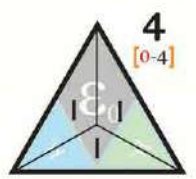
$E = \sum_{\text{all fascia}} E$

Energy of a massive particle is the total of all Planck quanta (compton frequency) in a 3D geometry



$\vec{p} = \sum_{\text{all fascia}} \vec{p}$

Total Momentum is the total of all quanta linear Momenta in a 3D particle



Negative standing-wave
Matter

Relativistic Matter
in motion

$I = \sum_{\text{all fascia}} I$

Inertial mass is the total of all inertia in a 3D particle

Photons have null energy-momentum tensors

Note that both 2D mass-energies [Special Relativity] and 3D Matter [General Relativity] have distinct Energy momenta

It is the 3D Tetrahedral topologies that provides a definative basis for Matter

Relativistic Matter
in motion

Tetryonic Energy momenta tensors should not be confused with Four vector tensors which map energy-momenta vectors in 3D spatial[cartesian] co-ordinate systems

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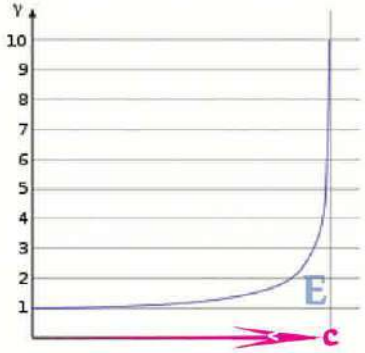
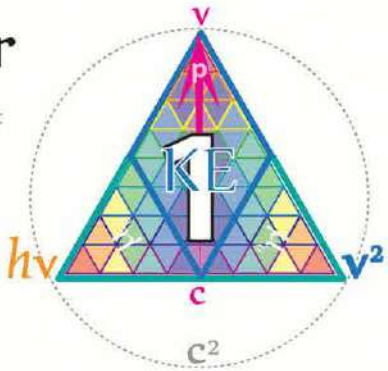


Relativistic Lorentz correction factor

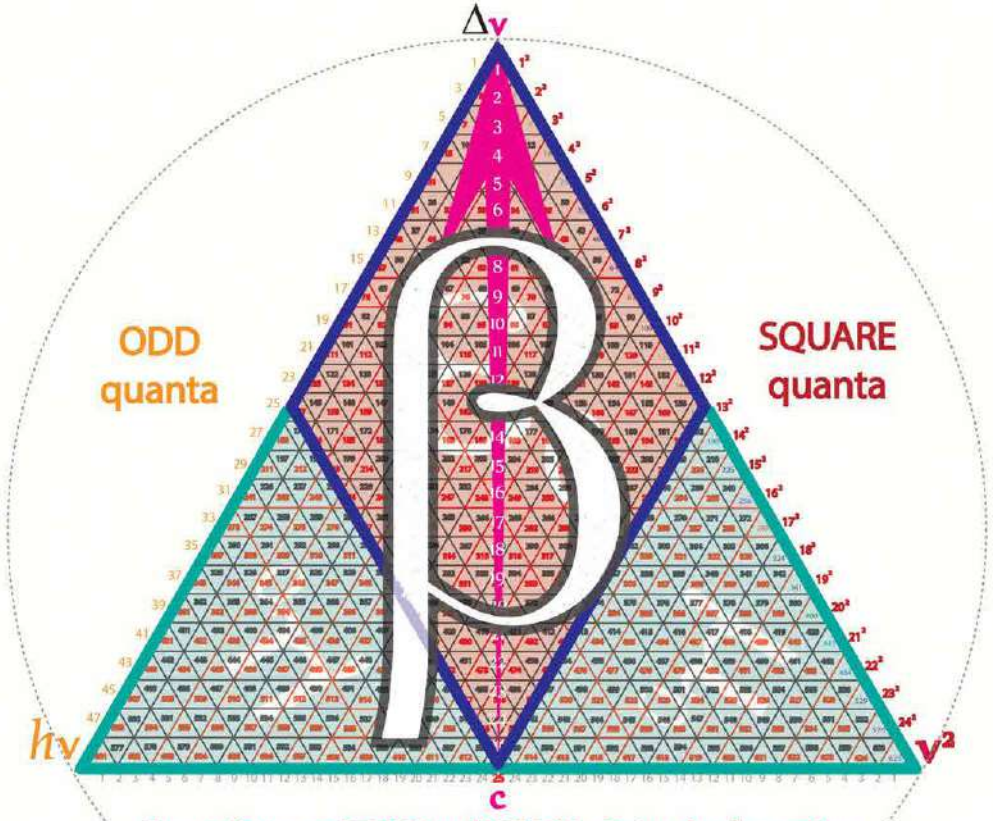
The Lorentz factor or Lorentz term is an expression which appears in several equations in special relativity
It is often incorrectly graphed (as pictured to the right) as an increasing function of velocity approaching but never reaching c

'c' is the maximum velocity achelvable through the electrical acceleration of particles is NOT the maximum velocity possible for Matter in motion



Linear correction factor

$$\beta = \left[\frac{v}{c}\right]$$



Scalar correction factor

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

$$\Delta\frac{\gamma}{c^2}$$ Wavelength contraction

Lorentz factors are LINEAR and SCALAR velocity related corrections to the relativistic mass-energy momenta content of any physical system accelerated by EM Forces

$$\frac{\Gamma}{c^2}$$ Lorentz corrections

Time Dilation $$\Delta\frac{\Omega}{c^2}$$

$$\Delta\frac{mv}{c^2}$$ Relativistic momentum

Relativistic mass-energy $$\Delta\frac{h\nu}{c^2}$$

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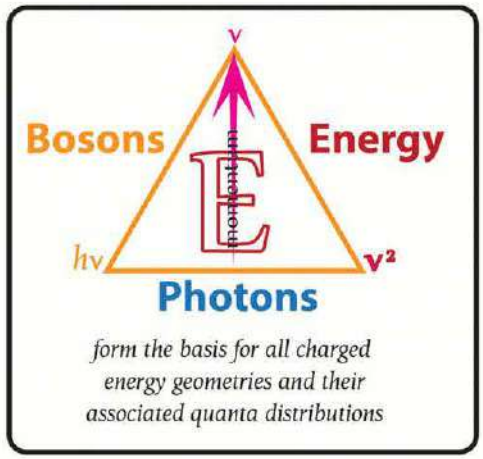
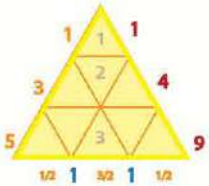
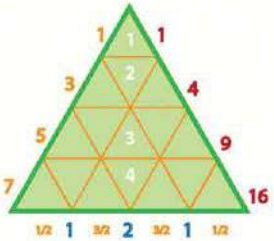
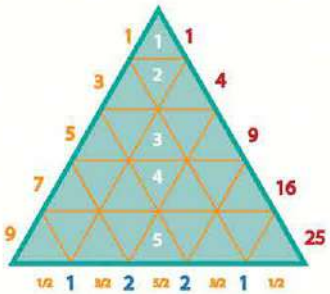


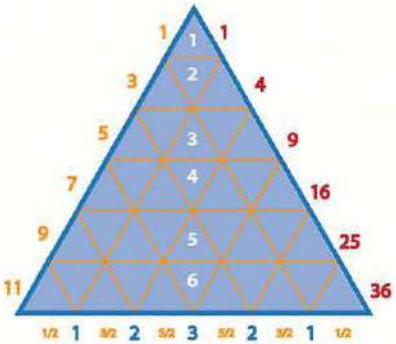
Equilateral energies

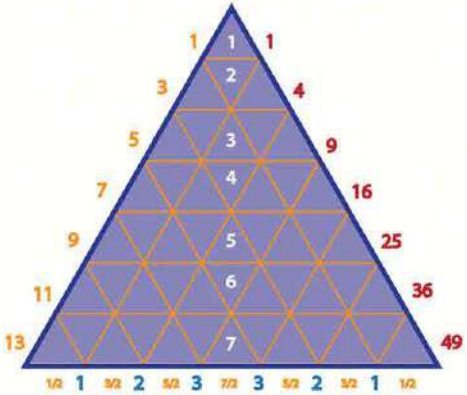
Any measurements of mass without a Space-Time co-ordinate system are measurements of Energy

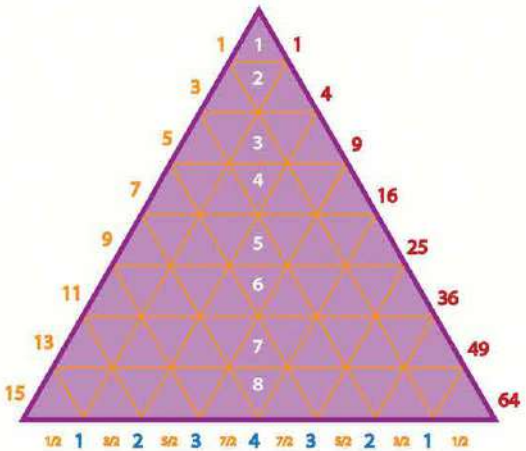


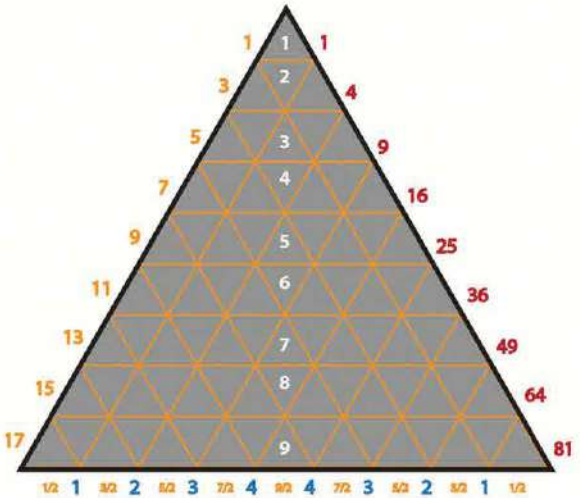












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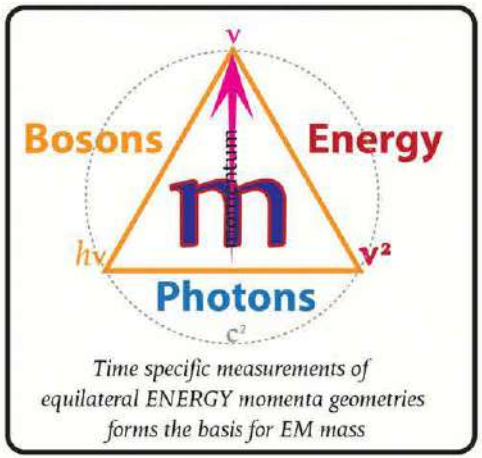
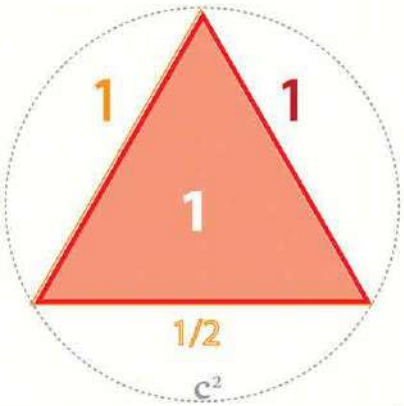
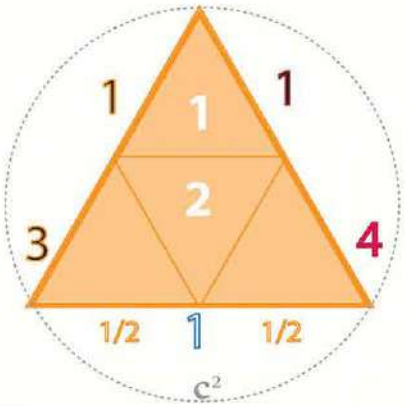


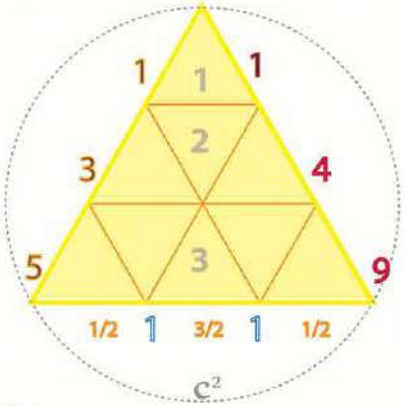
Time specific measurements of equilateral ENERGY momenta geometries forms the basis for EM mass

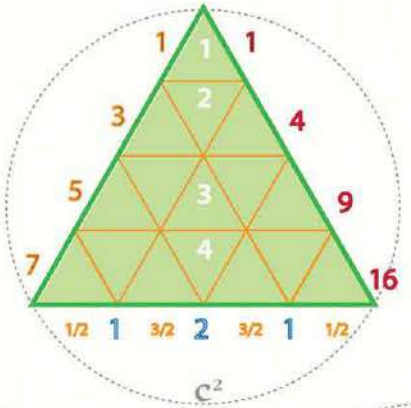
Electromagnetic mass

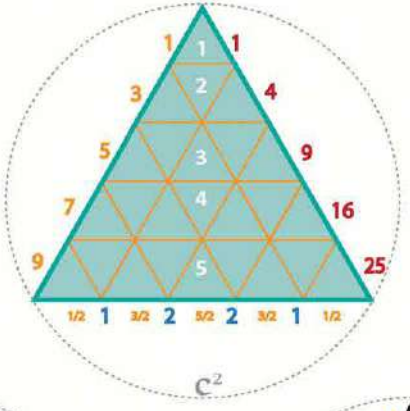
2D mass-energy is the surface integral of 3D Matter

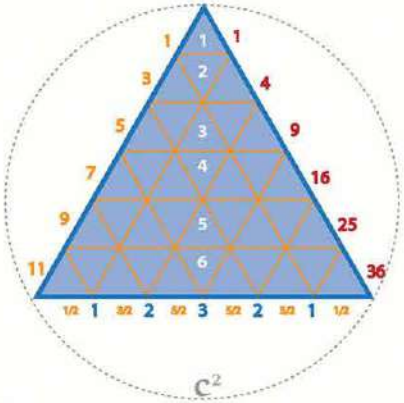


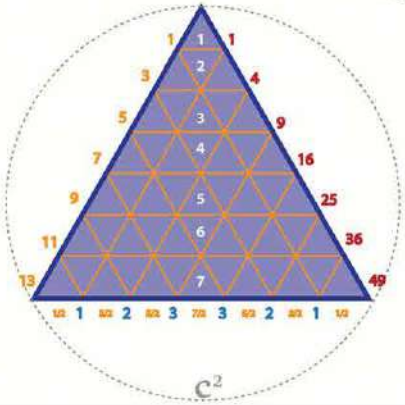


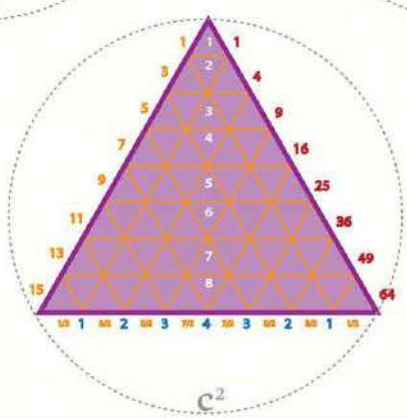


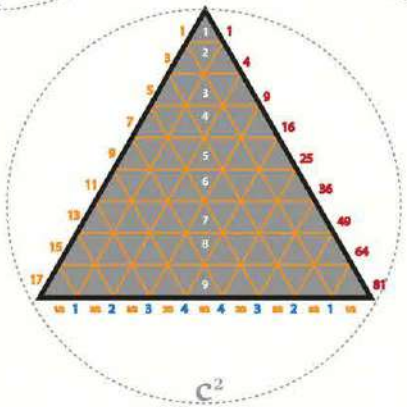












mass-less particles is a physical misnomer

All measurements of energy in spatial co-ordinate systems are measurements of mass

Matter-less is the appropriate terminology

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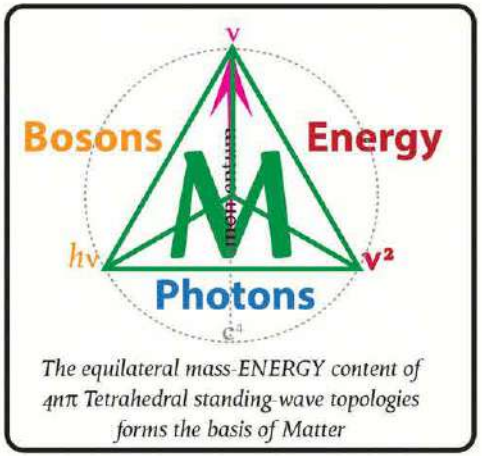
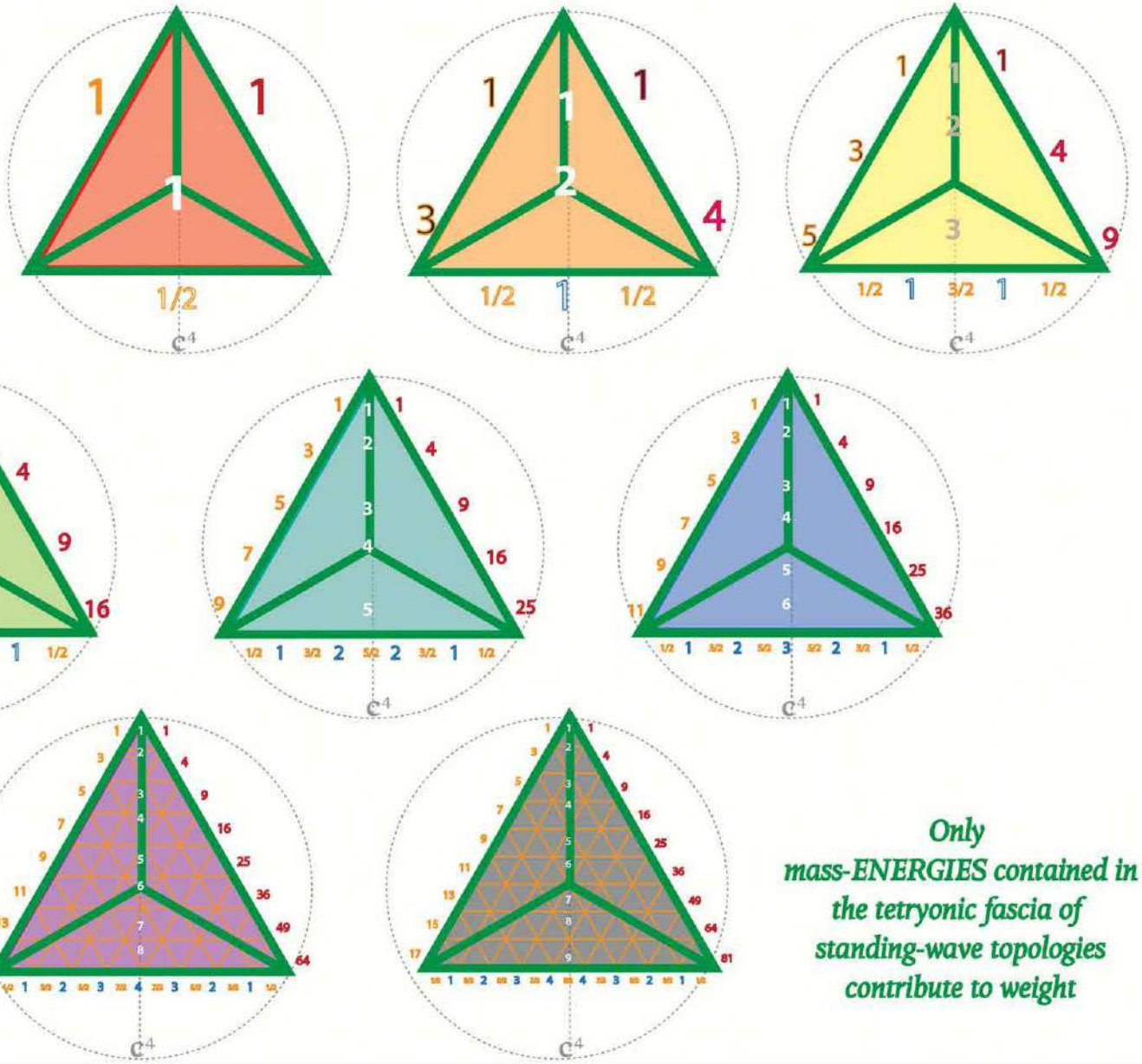
Standing-wave Matter

Matter is a higher order 3D topology created by standing wave mass-energies



The equilateral mass-ENERGY content of 4nπ Tetrahedral standing-wave topologies forms the basis of Matter



Only mass-ENERGIES contained in the tetryonic fascia of standing-wave topologies contribute to weight

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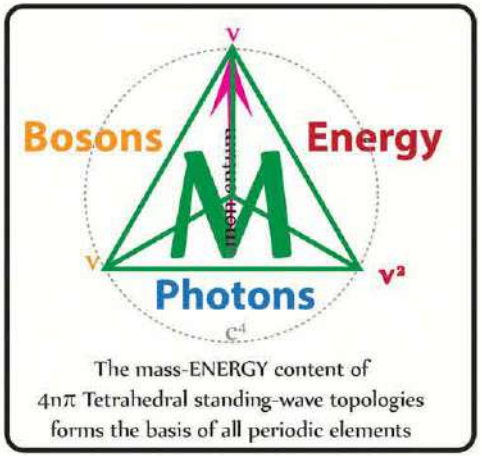
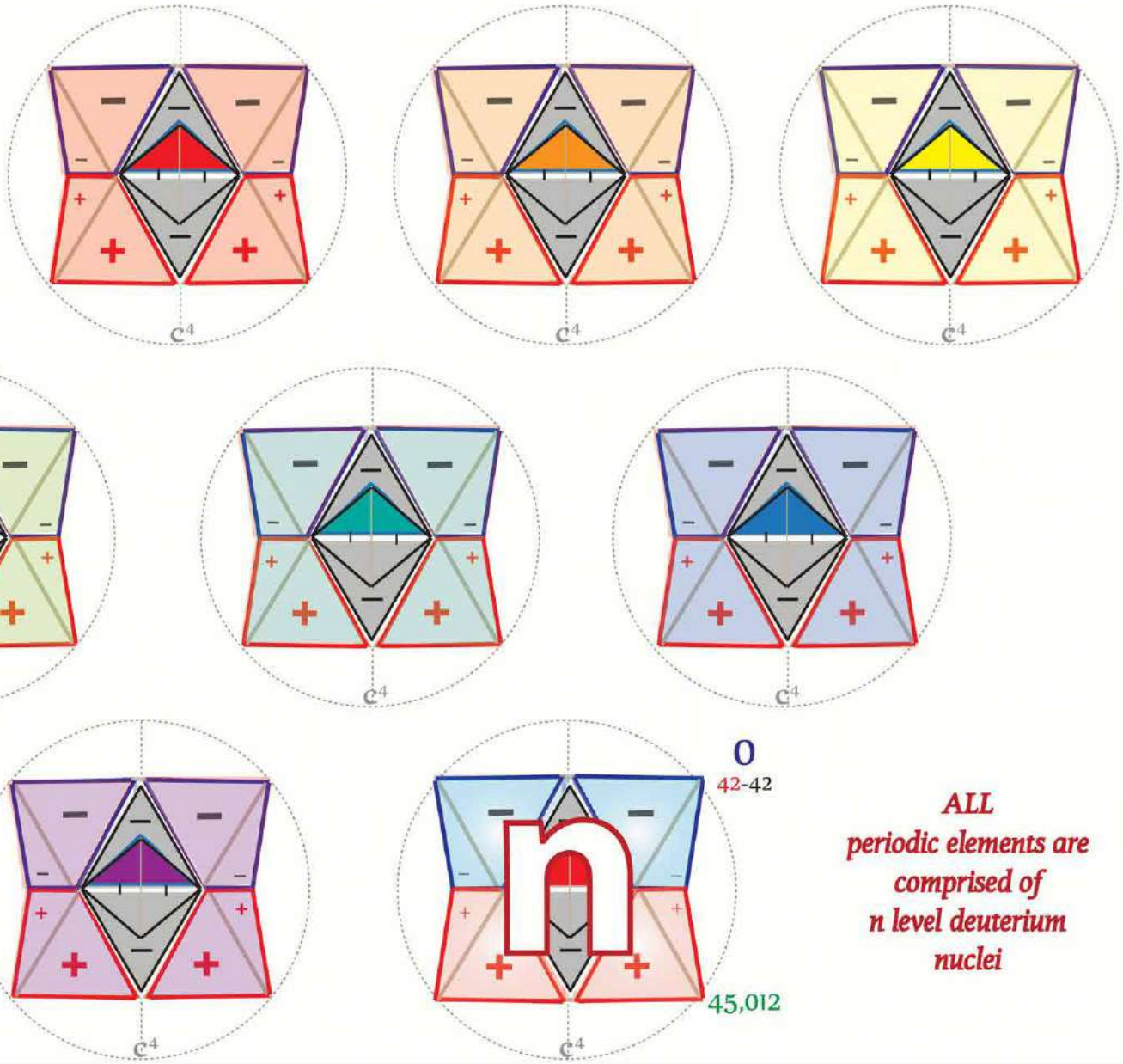


The mass-ENERGY content of
4nπ Tetrahedral standing-wave topologies
forms the basis of all periodic elements

Periodic element nuclei



ALL periodic elements are comprised of n level deuterium nuclei

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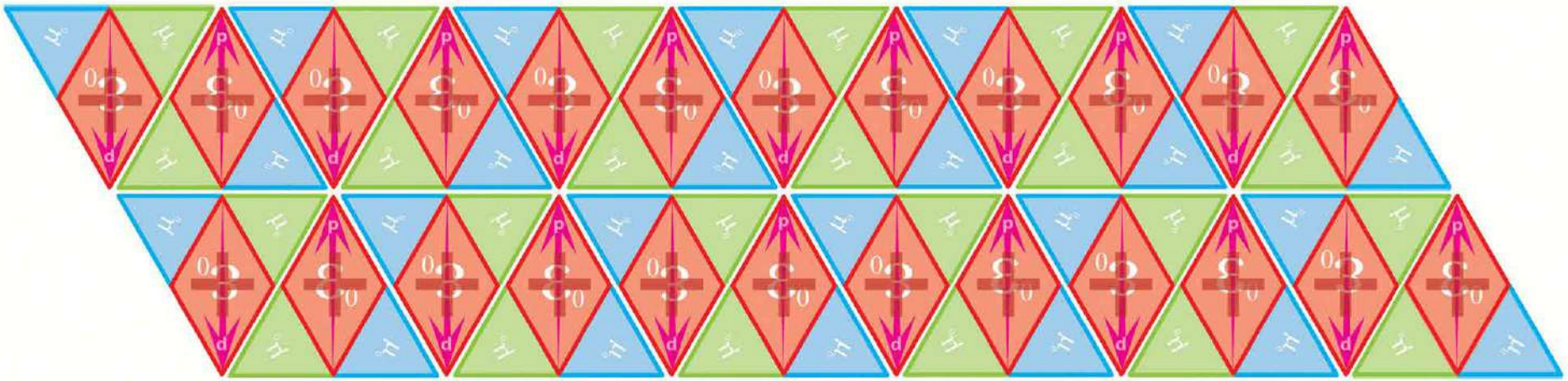
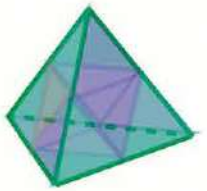
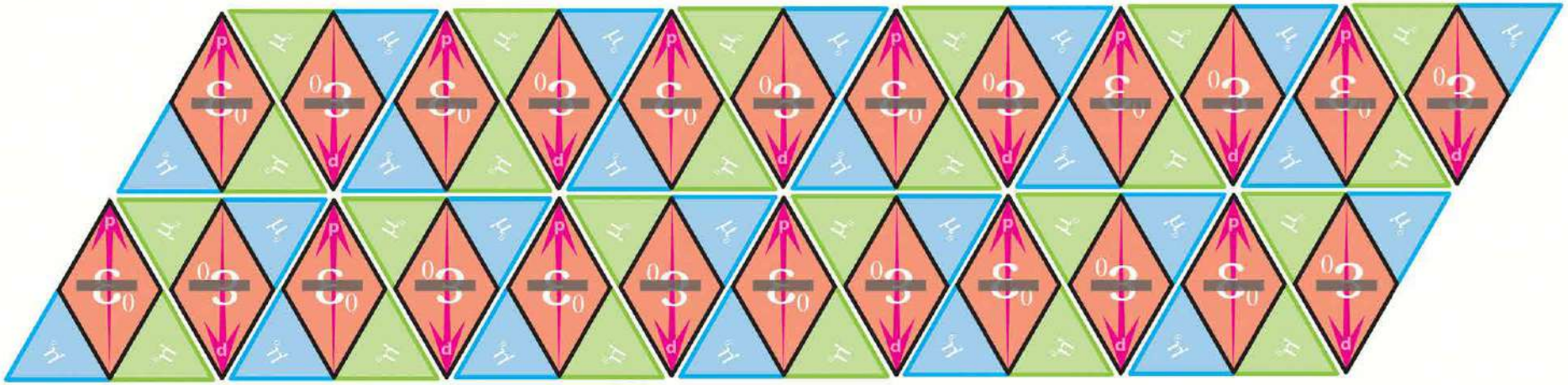


n1 - Charged Tetryon Templates





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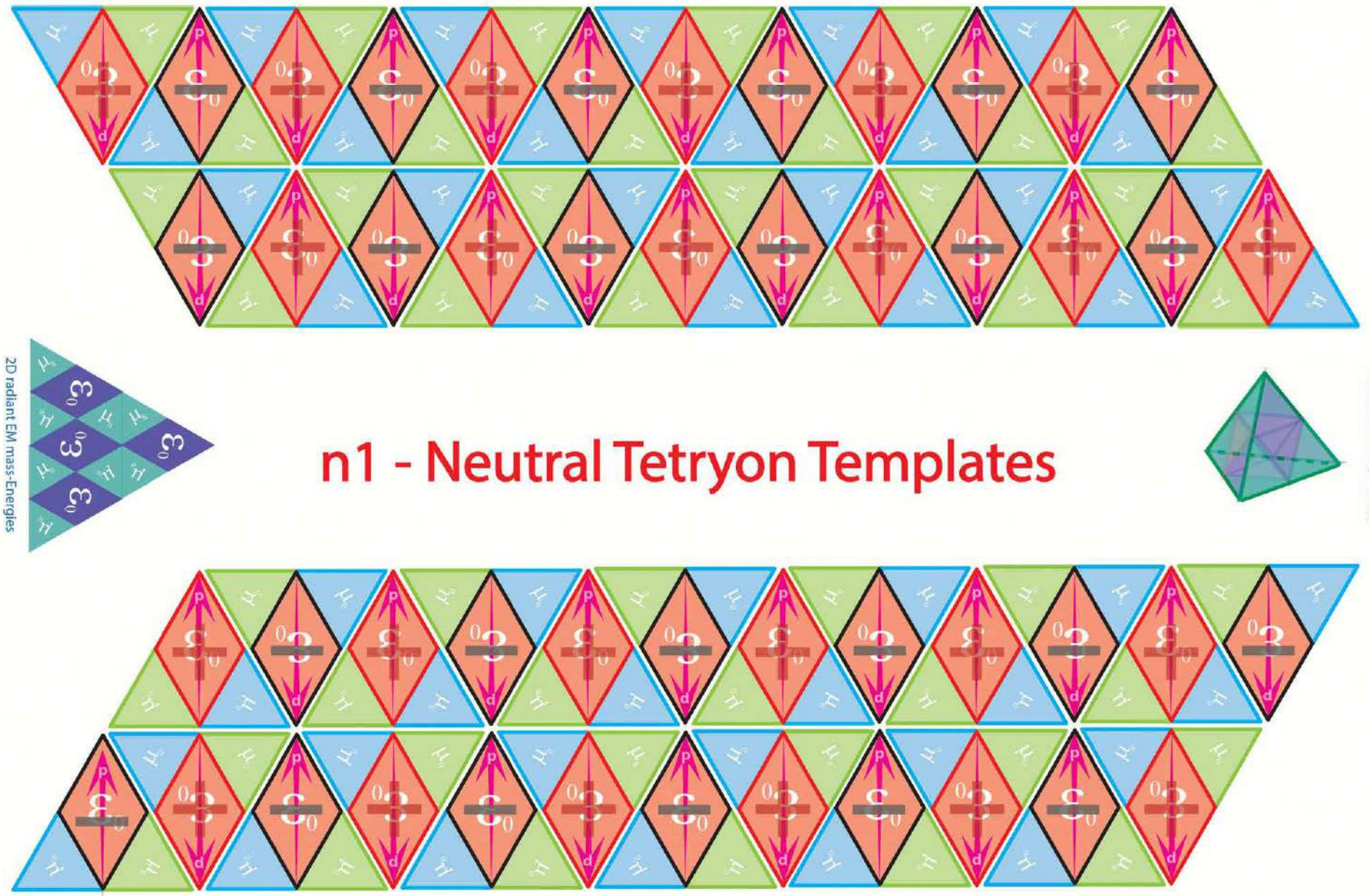

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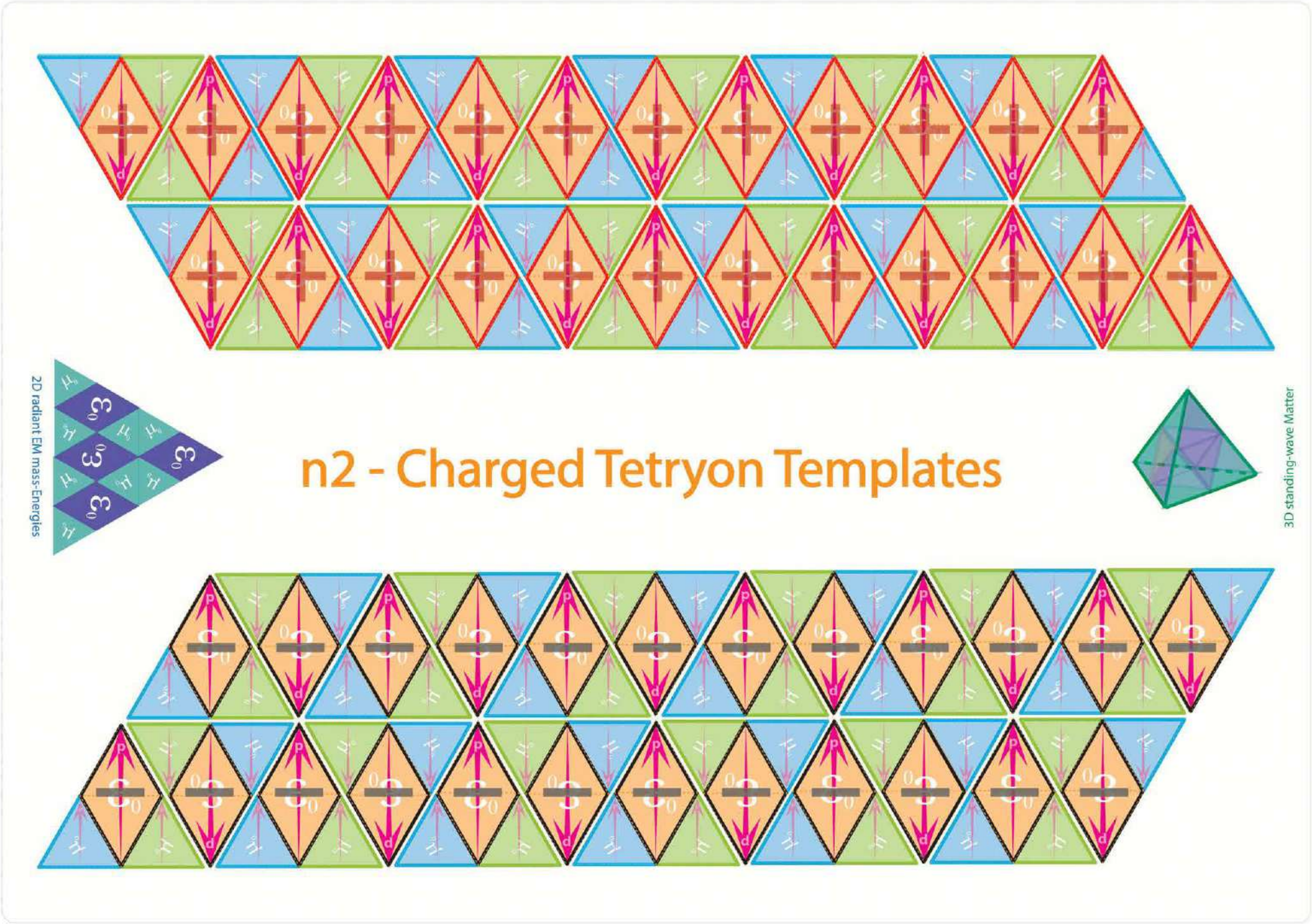

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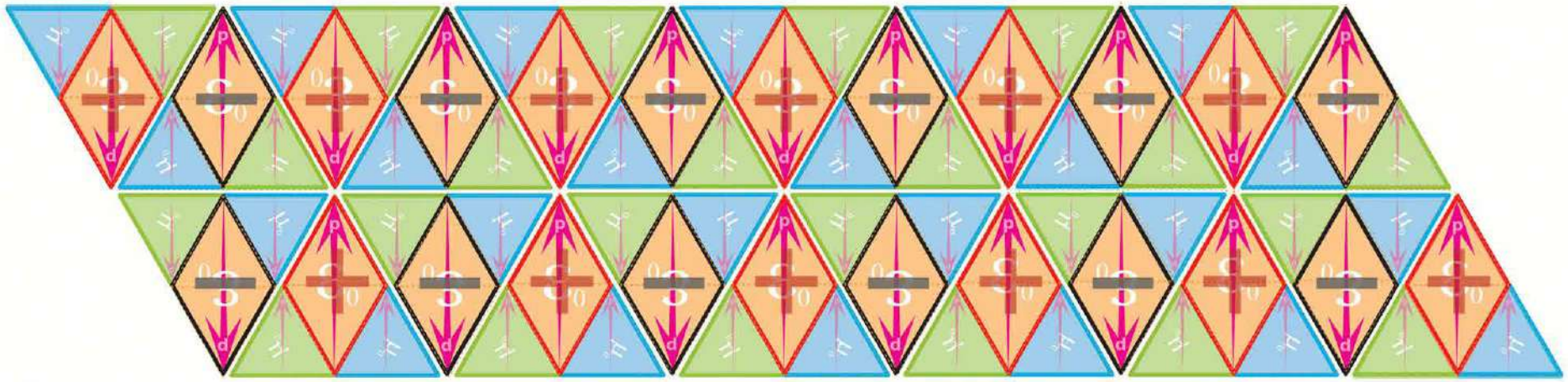
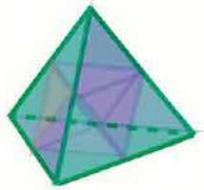
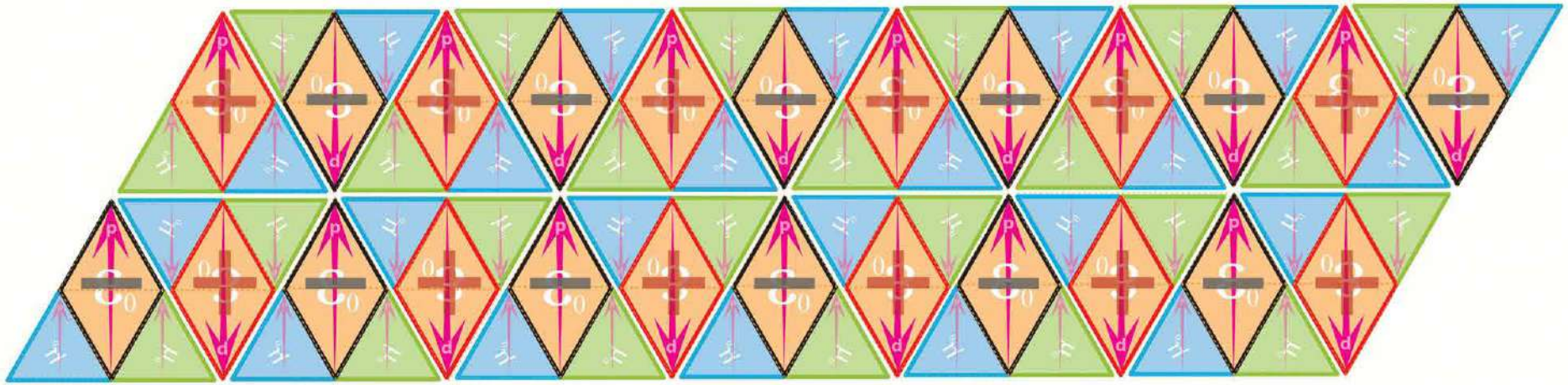


n2 - Neutral Tetryon Templates





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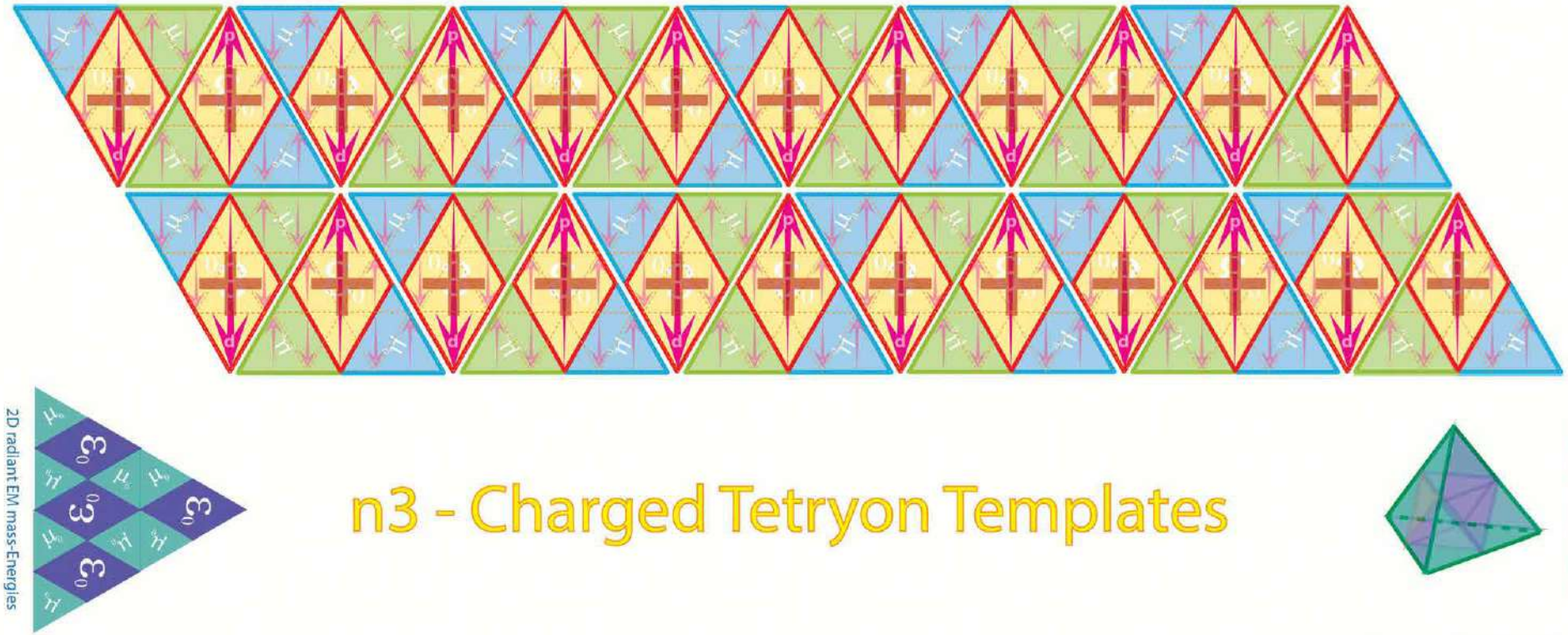
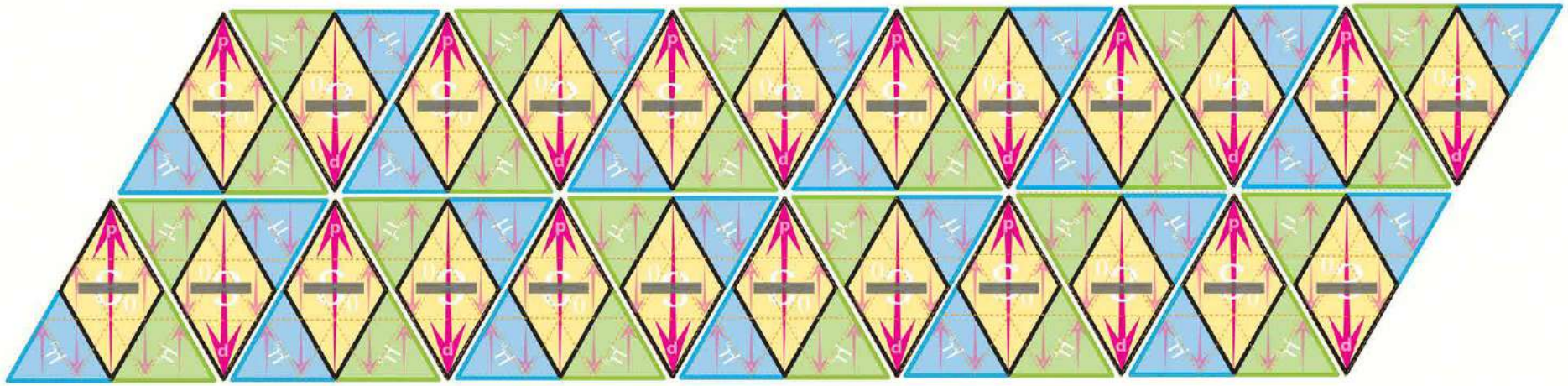


2D radiant EM mass-Energies

n3 - Charged Tetryon Templates

3D standing-wave Matter



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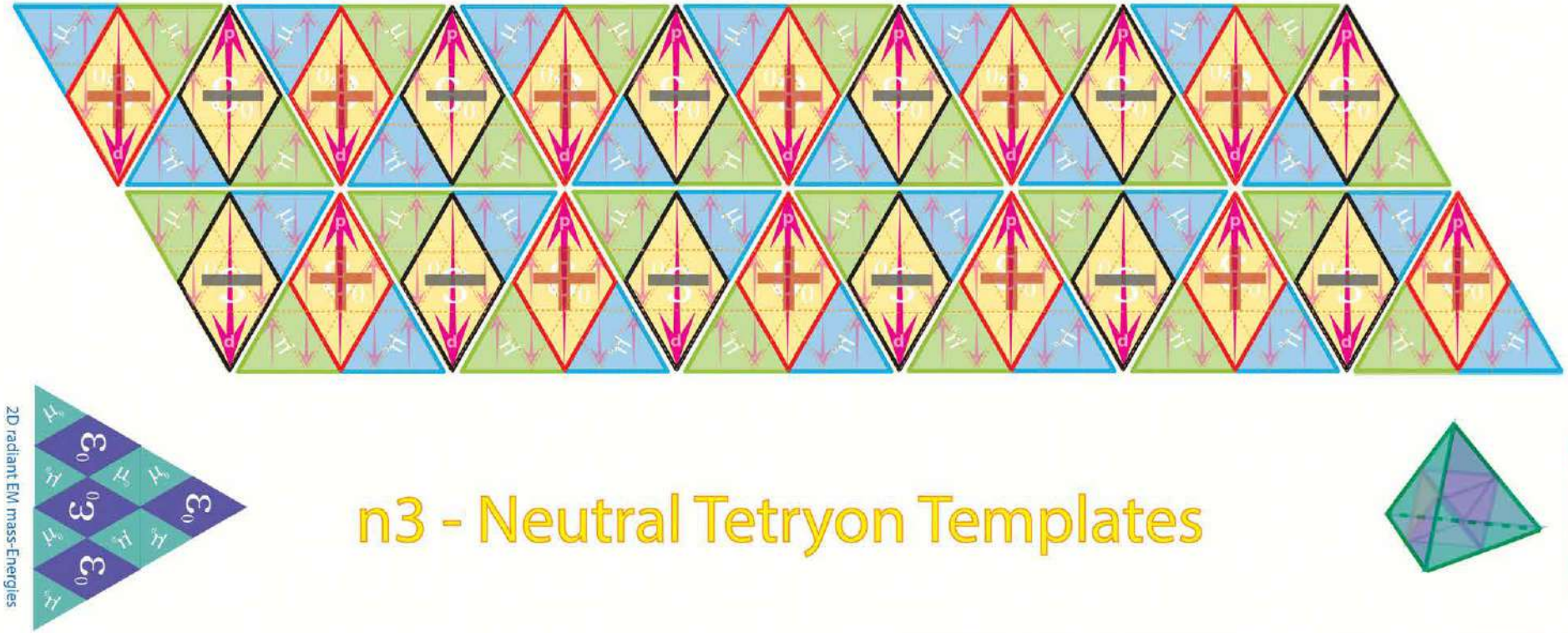
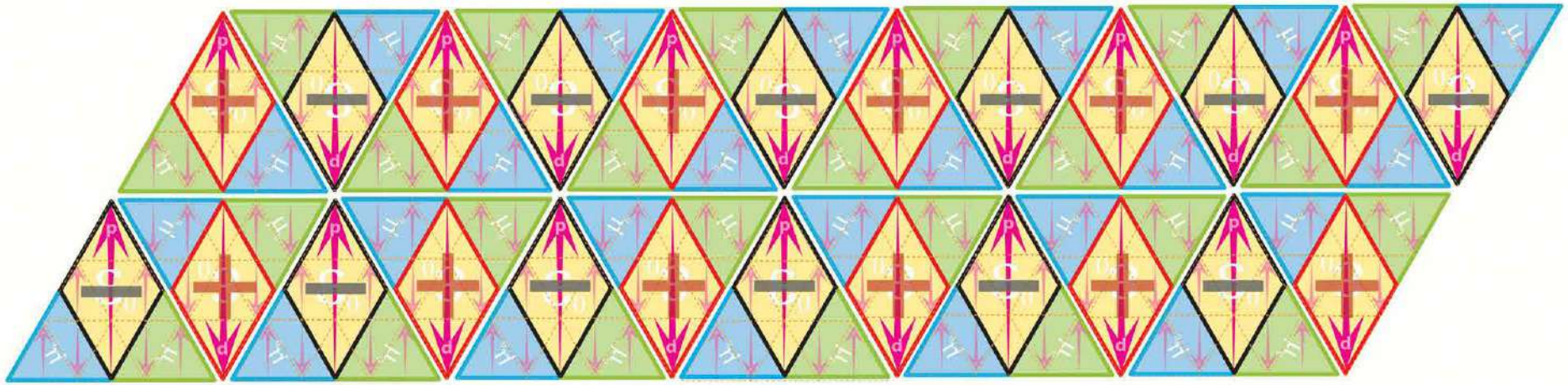


n3 - Neutral Tetryon Templates



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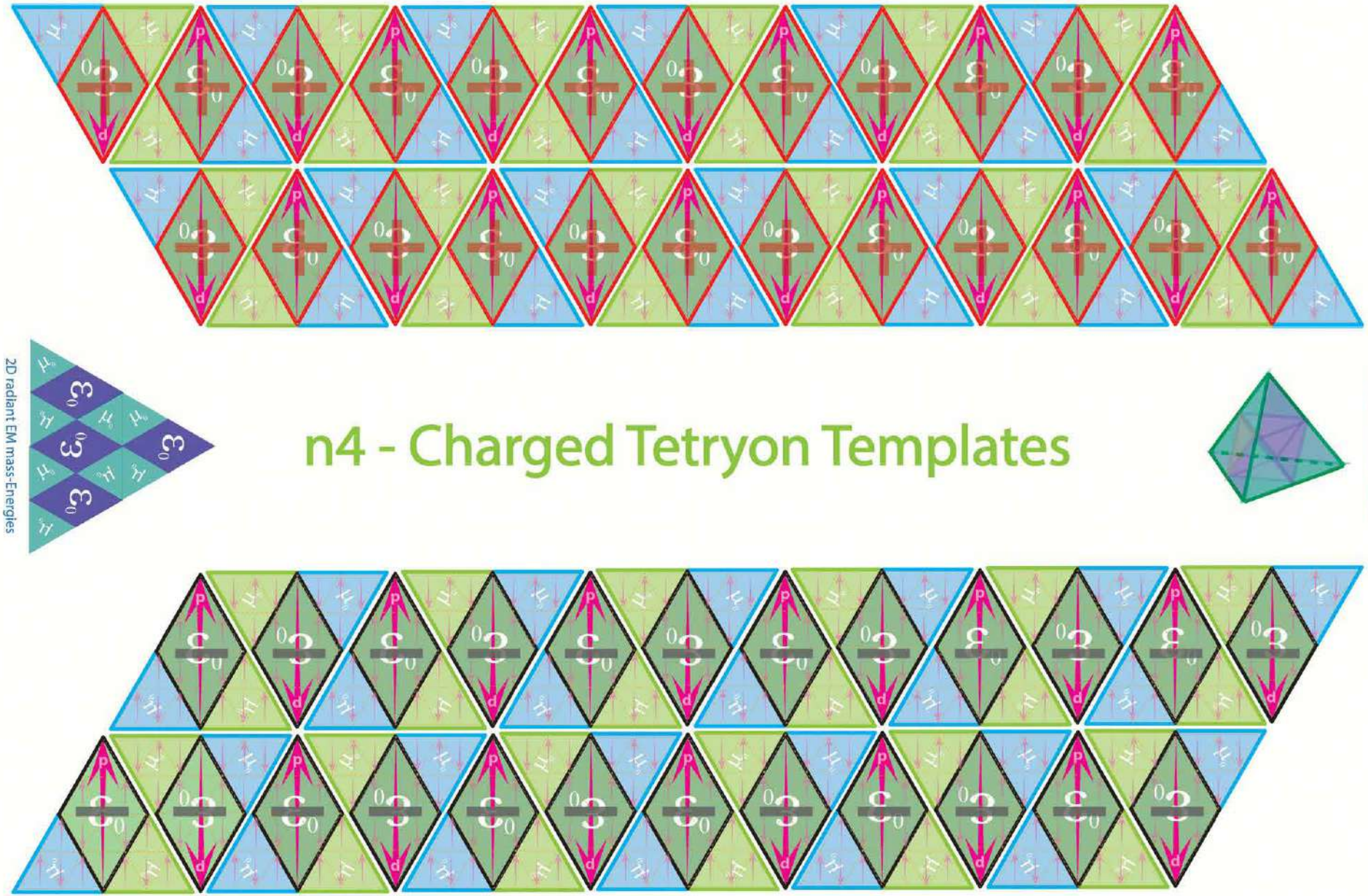

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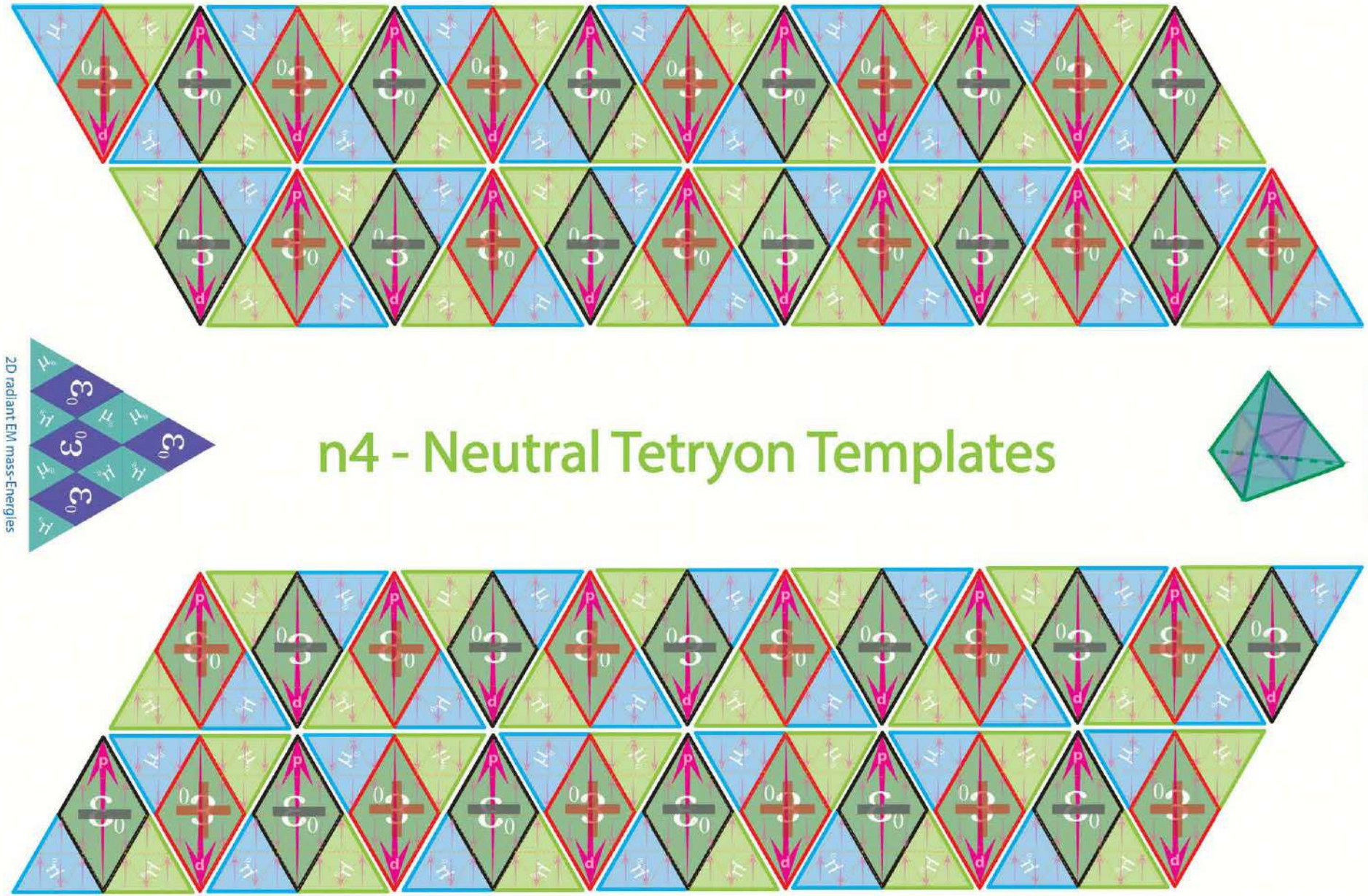

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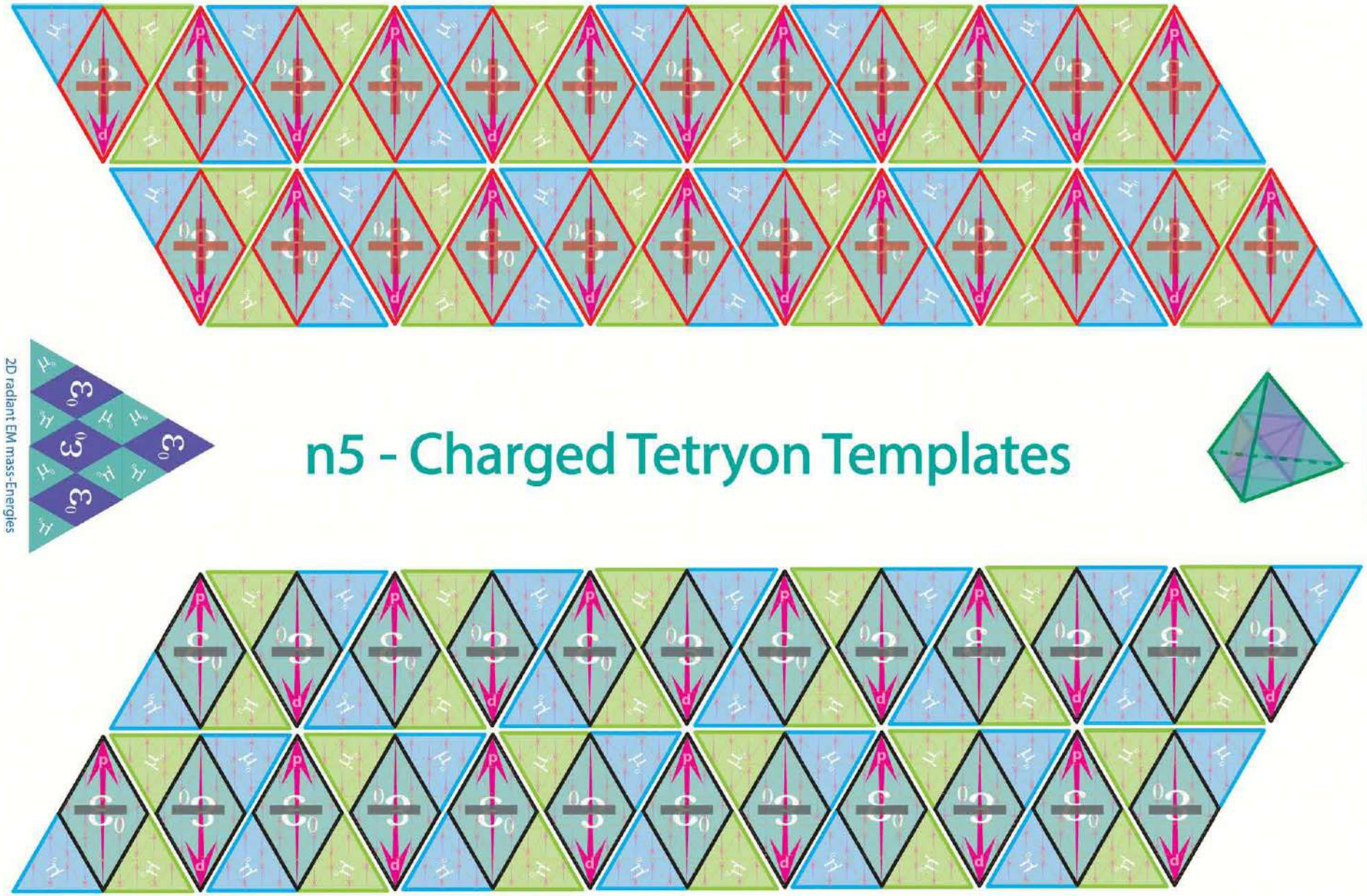

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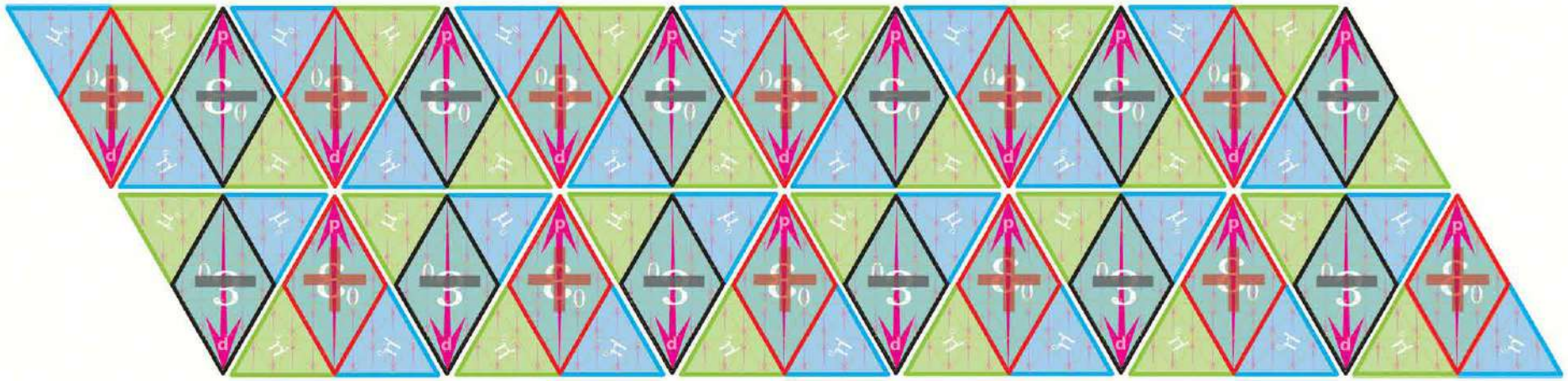
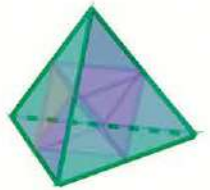
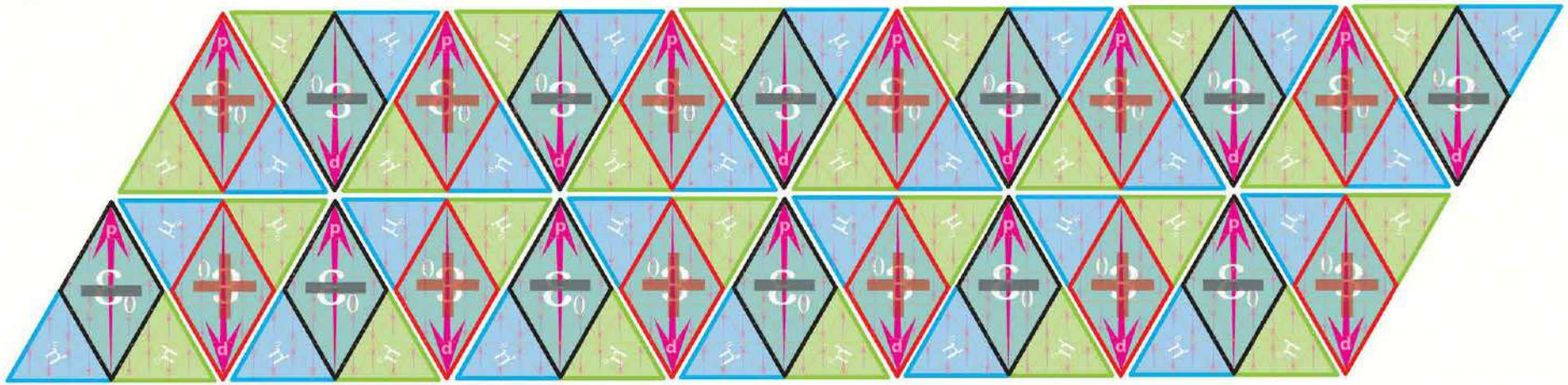


n5 - Neutral Tetryon Templates





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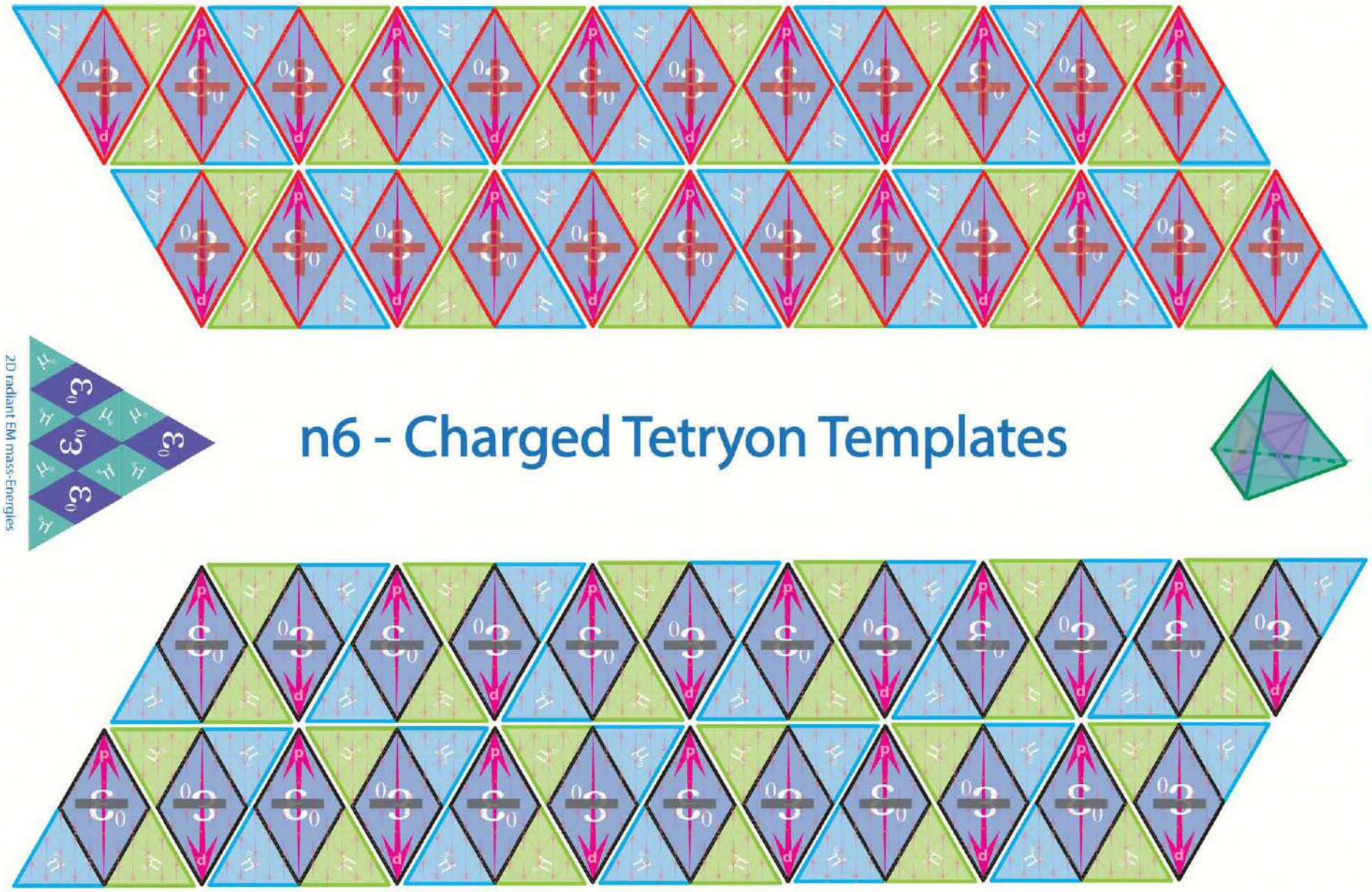

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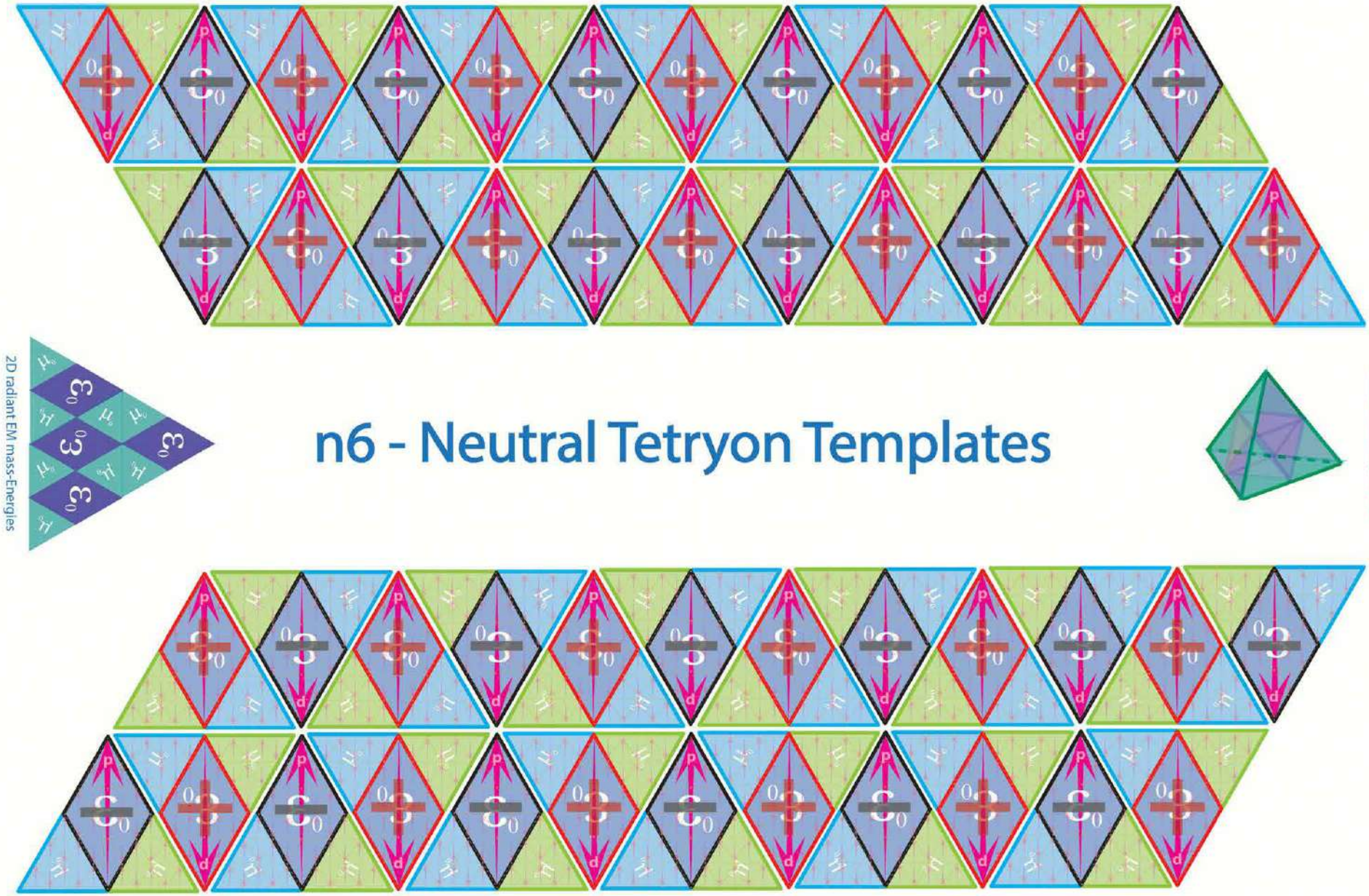

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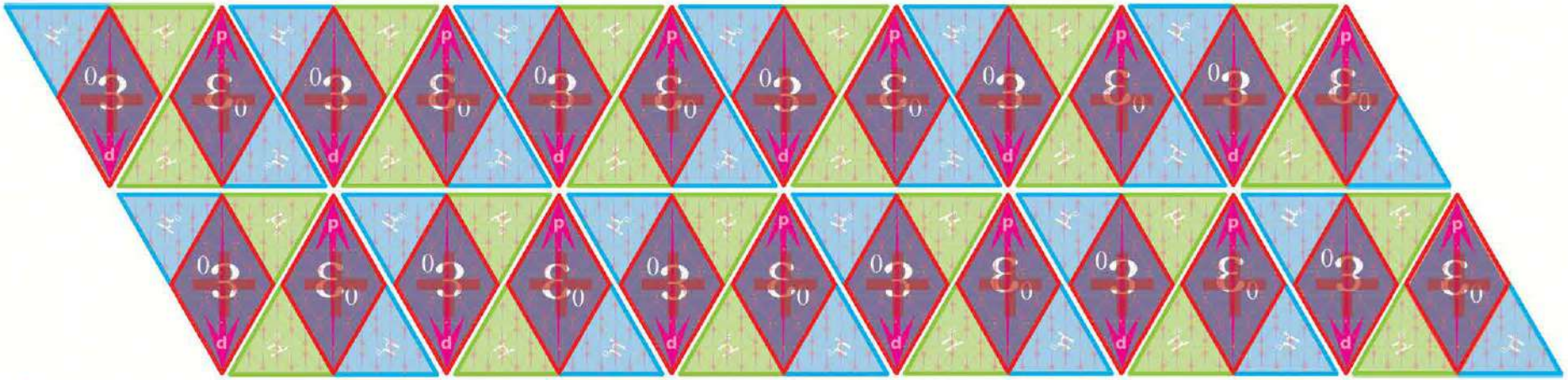
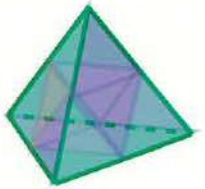
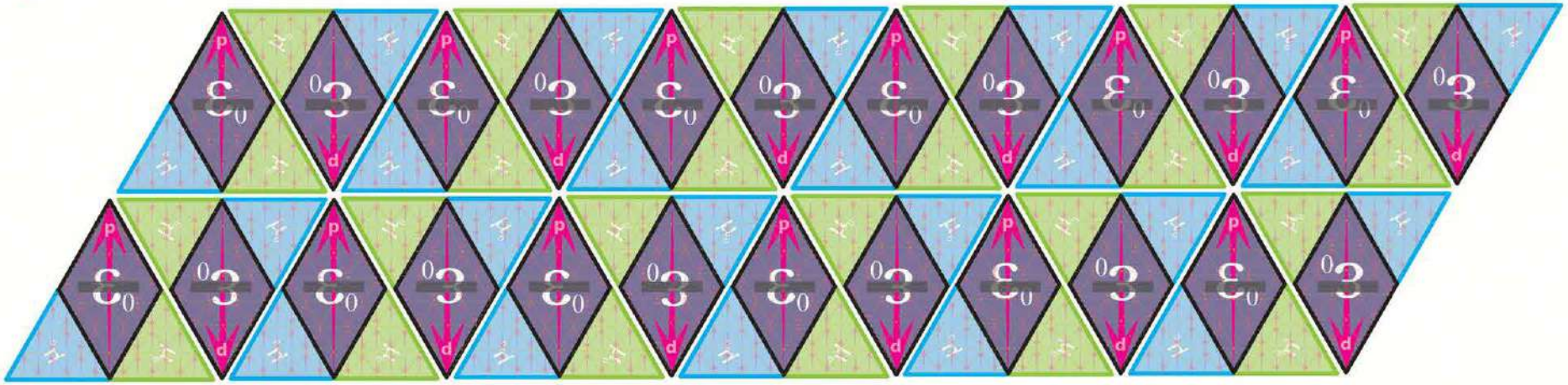


n7 - Charged Tetryon Templates





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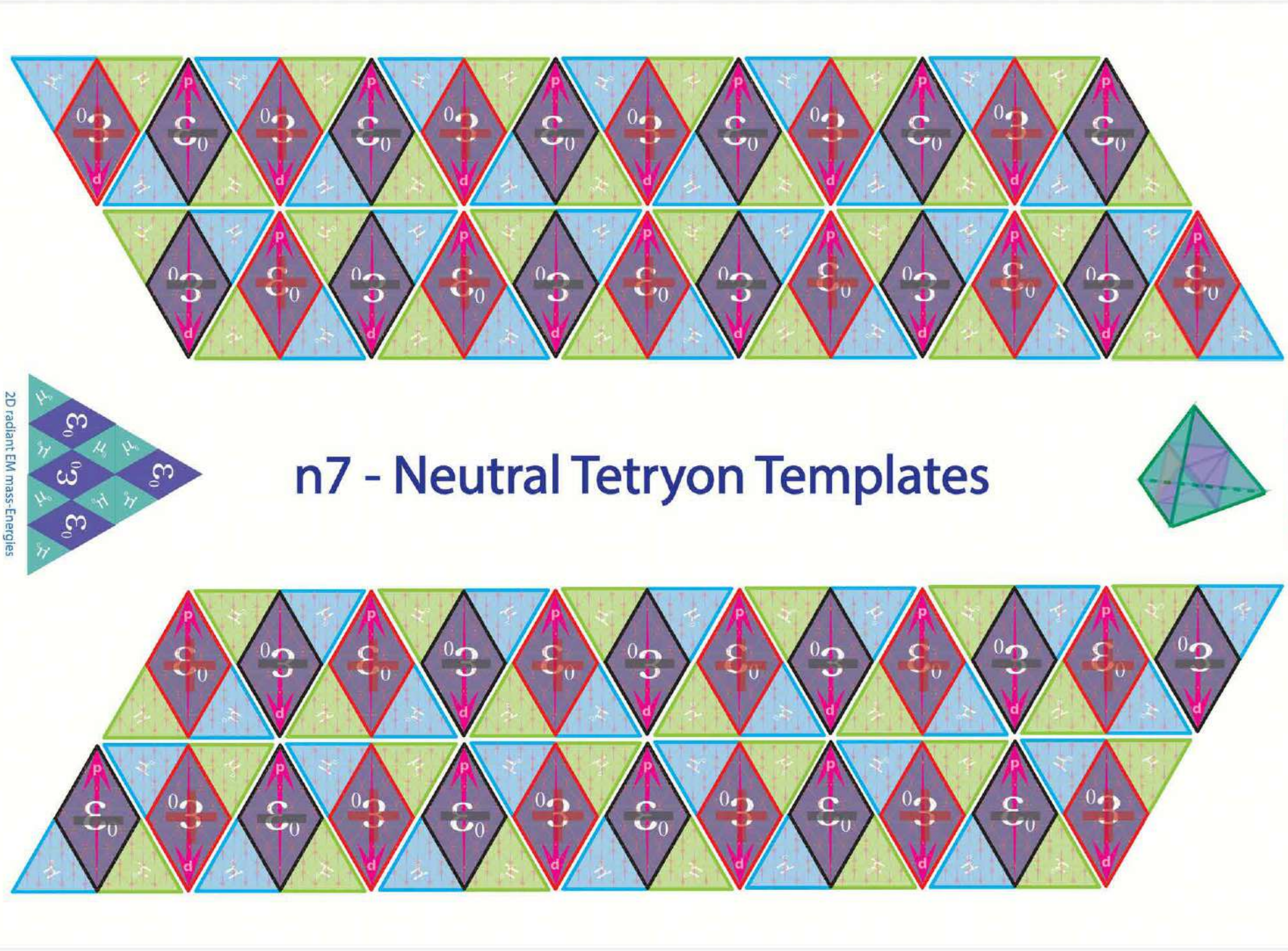

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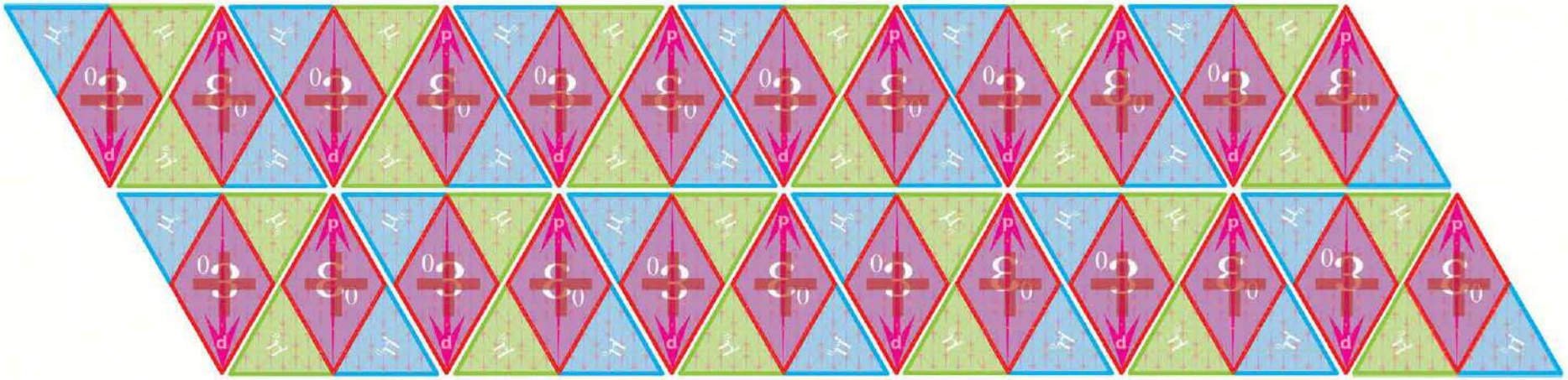
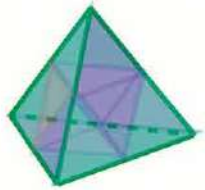
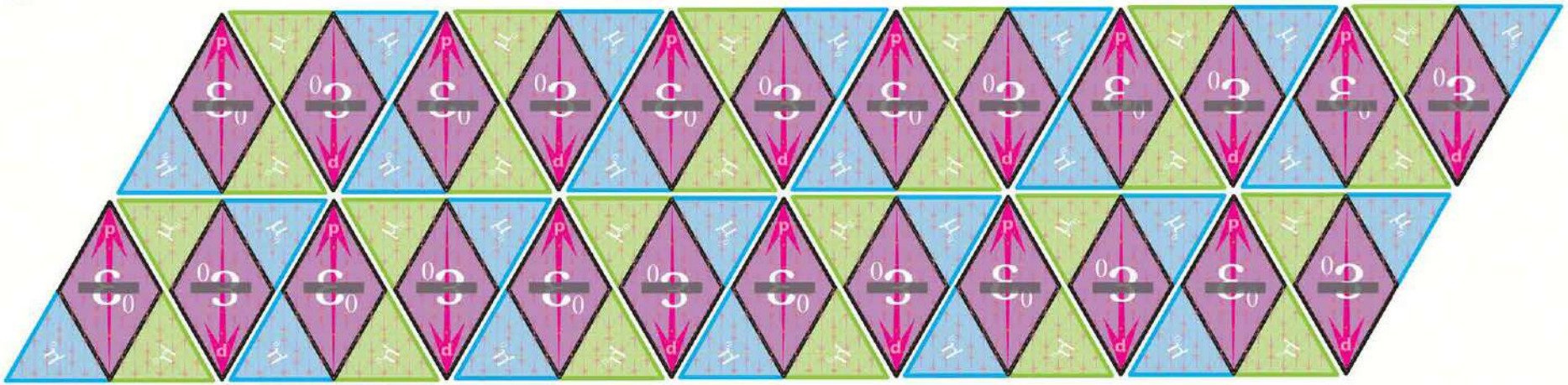


n8 - Charged Tetryon Templates





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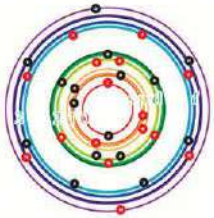
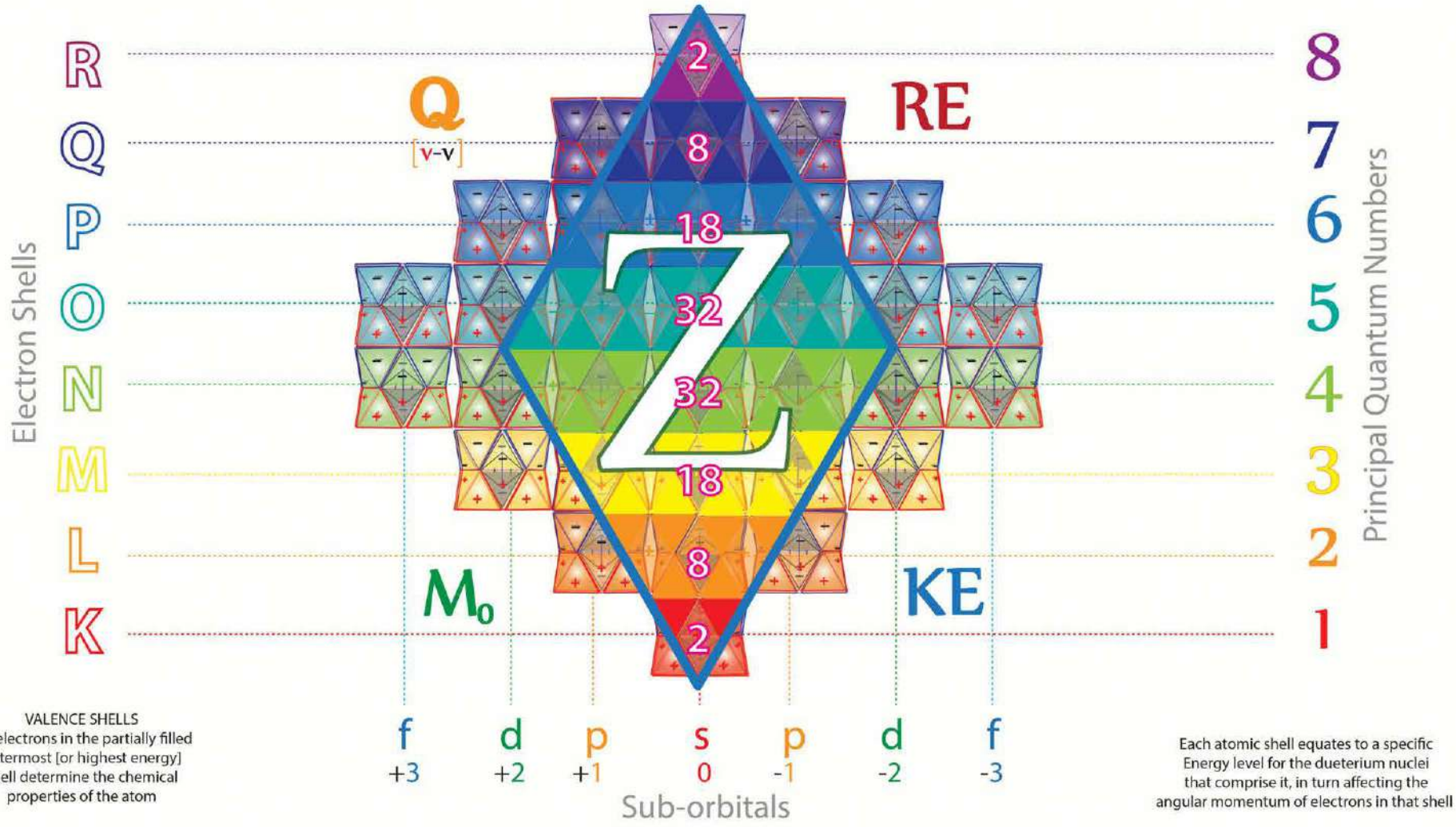


Each shell consists of one or more subshells, and each subshell consists of one or more atomic orbitals.

Periodic element geometries

An electron shell may be thought of as an orbit followed by electrons around an atom's nucleus. The closest shell to the nucleus is called the "1 shell" (also called "K shell"), followed by the "2 shell" (or "L shell"), then the "3 shell" (or "M shell"), and so on further and further from the nucleus. The shell letters K, L, M, ... are alphabetical

Each shell can contain only an integer number of whole deuterium nuclei [Proton, Neutron & electron]



VALENCE SHELLS
The electrons in the partially filled outermost [or highest energy] shell determine the chemical properties of the atom

Each atomic shell equates to a specific Energy level for the dueterium nuclei that comprise it, in turn affecting the angular momentum of electrons in that shell

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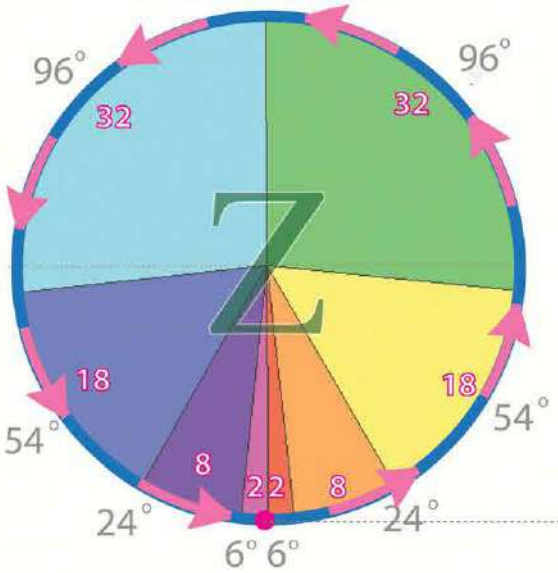
Periodic Harmonic motions

$x = A \cos(\omega t + \varphi)$

Much of the math in of modern physics is predicated on the assumption that π [where it appears] is related to the properties of a circle

$F = -kx$

Circular motion



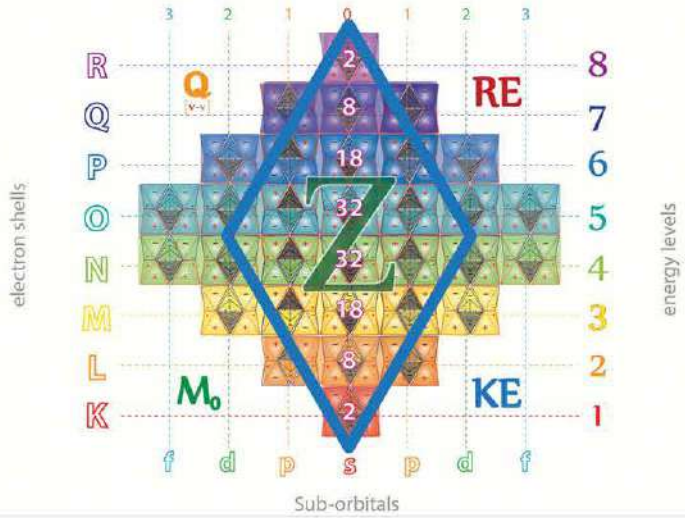
Linear motion

Simple harmonic motion can be visualized as the projection of uniform circular motion onto one axis

Principal Quantum Numbers

circular harmonic motion

simple harmonic motion



Circular motions describe the motion of a body with a changing velocity vector [the result of an acceleration force].

Nuclei per shell in elements follows a 'periodic summation rule' that is reflective of photonic energies

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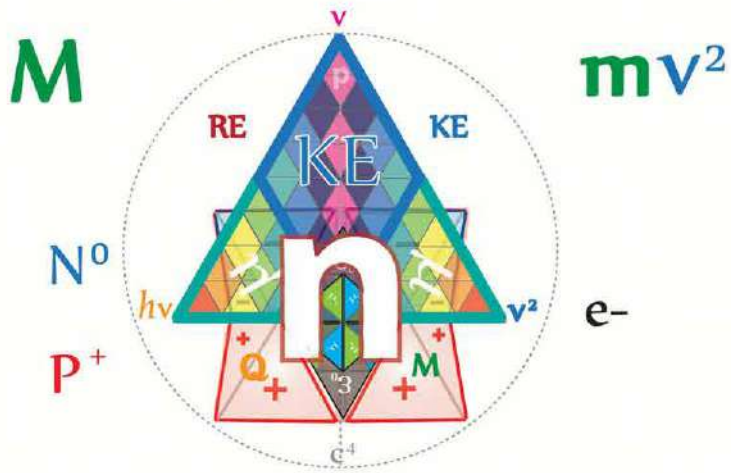
Atomic nuclei mass-energies

Each element's weight [mass-Matter in a gravitational field] is the result of the total quanta comprising that element



The nuclei forming each atomic shell have specific mass-energy quanta

$$\overset{8}{\underset{1}{n}}\left[\left[72(n)^2\right]+\left[12e19\right]+\left[m_e v^2\right]\right]$$

Baryon rest masses · lepton rest mass · KEM

Deuterium mass-energy per shell

Despite having differing mass-energies each Deuterium nuclei has the same velocity invariant Matter geometry [84π]

spin orbital coupling in synchronous quantum convertors

Electrons act as quantum scale rotating armatures in atomic nuclei and can only have specific energies reflective of the electron orbital energy level of the Baryons in which they are found

They acheive these energy levels by absorbing or emitting photons to acheive the specific angular momentum required

Baryon mass-energies
n
E
The quantum level mass-energies of Baryons determines the kinetic energies of electrons
1n - 1 e19v
electron KEM field
hv²
73,728 n32 8 v8 3.268969693 e15
69,192 n31 7 v7 2.502804921 e15
64,800 n30 6 v6 1.838795452 e15
60,552 n29 5 v5 1.276941286 e15
56,448 n28 4 v4 8.172424232 e14
52,488 n27 3 v3 4.596988631 e14
48,672 n26 2 v2 2.043106058 e14
45,000 n25 1 v1 5.107765145 e13
1.2 e20
electron rest Matter is velocity invariant
Compton frequencies
930 MeV
496 keV
spectral frequencies
13.6 eV

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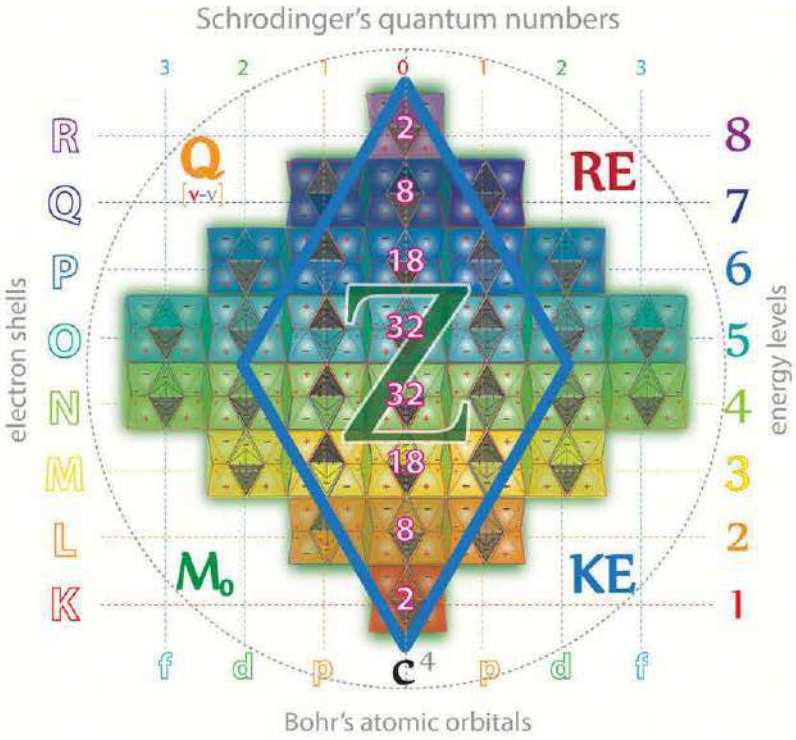
Baryons **930.947 MeV** + KEM fields **13.525 ev** + electrons **496.519 keV**

Mapping Planck mass-energy contributions to elementary Matter and isotopes



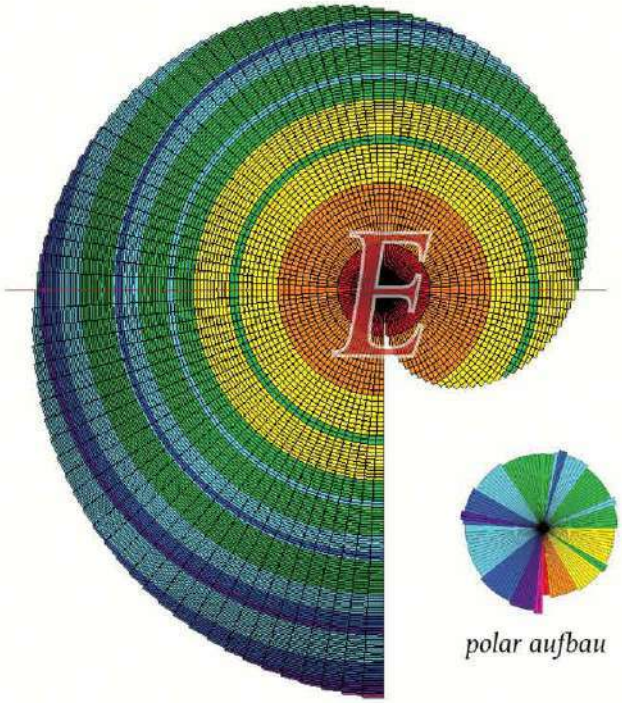
$E = hv^2$

$n^2 + v^2 + e = Z$

general form quatratic equation

$ax^2 + bx + c = Z$

$E = nhv$



polar aufbau

polar energy spirals courtesy of Rene Cormier

Identifying electron rest Matter topologies as velocity invariant we can re-arrange the component Planck mass-energy geometry formulation of periodic elements to

$$h\left[72[v^2]_{\text{Deuteron rest mass}} + v_{\text{Spectral lines}} + 1.20\,e20\,v_{\text{electron rest mass}}\right]$$

reveal a quadratic formulation for all Z numbers

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$$\sum_{K}^{R}$$

nuclei per shell

$$\sum_{K}^{R} Z$$

Periodic Summation

Periodic summation is a notation developed for Tetryonic theory to model the geometric series addtion of Z[n²] energy level Deuterium nuclei that form the periodic elements

$$\sum_{1}^{120} Z$$

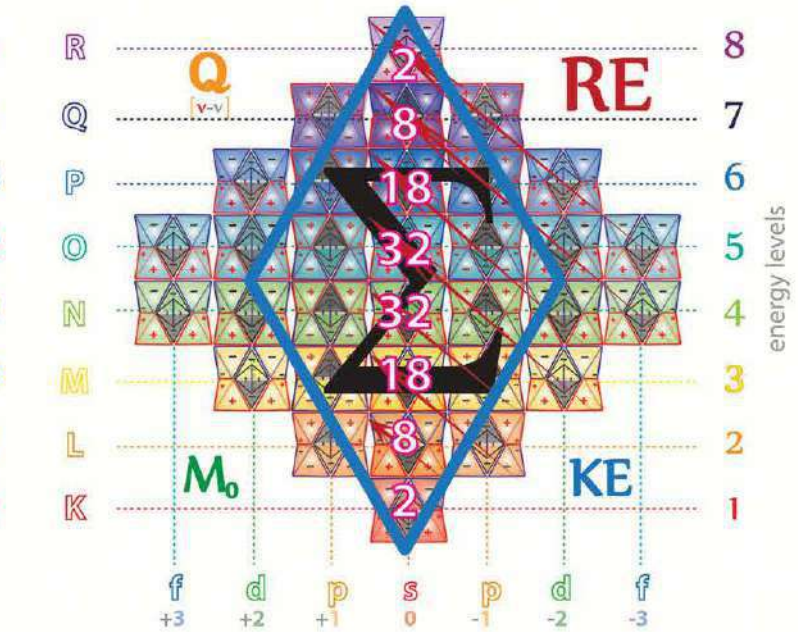
element number

STEP ONE

Periodic summation follows the atomic shell electron config

$$\sum_{K}^{R} 2(x^2) =$$

2	R	8
8	Q	7
18	P	6
32	O	5
32	N	4
18	M	3
8	L	2
2	K	1



Each atomic shell can hold only a fixed number of deuterium nuclei

STEP TWO

Periodic elements build up following the aufbau sequence

$\sum_{K}^{R} = 2$	2 nuclei [74,496 ea]	120	Unbinilium
$\sum_{K}^{Q} = 8$	+ 8 nuclei [69,780 ea]	118	Ununoctium
$\sum_{K}^{P} = 18$	+ 18 nuclei [65,232 ea]	110	Darmstadtium
$\sum_{K}^{O} = 32$	+ 32 nuclei [60,852 ea]	92	Uranium
$\sum_{K}^{N} = 32$	+ 32 nuclei [56,640 ea]	60	Neodymuim
$\sum_{K}^{M} = 18$	+ 18 nuclei [52,596 ea]	28	Argon
$\sum_{K}^{L} = 8$	+ 8 nuclei [48,720 ea]	10	Neon
$\sum_{K}^{K} = 2$	+ 2 nuclei [45,012 ea]	2	Helium
		0	Hydrogen

THe LHS of the notation determine the number of nuclei in each atomic shell, from the periodic mass-energy levels for atoms, and the RHS follows the aufbau building principle to determine the rest mass-Matter of any specific element

Aufbau

Each periodic element is made of Z [n² energy] deuterium nuclei

Z# [z Protons [24-12] | z Neutrons [18-18] | z electrons [0-12]] n1-8

Planck mass-energies form the surface integral of rest Matter topologies for each periodic element

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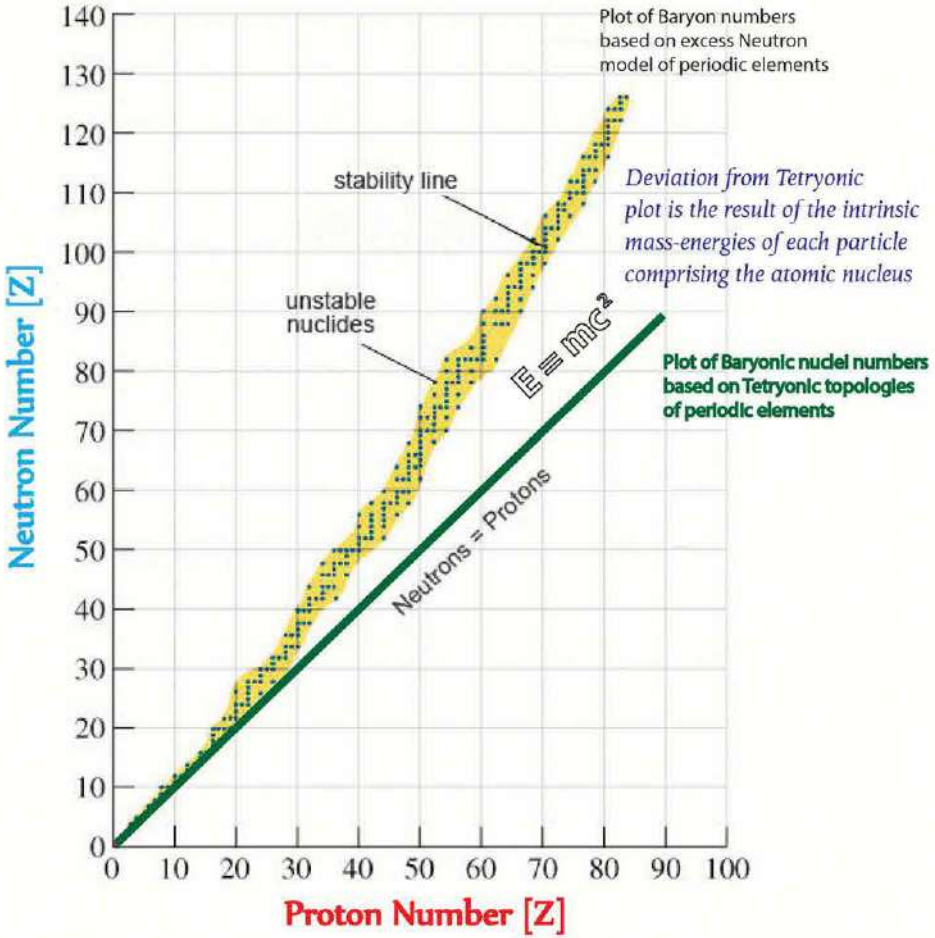
Proton - Neutron Curve

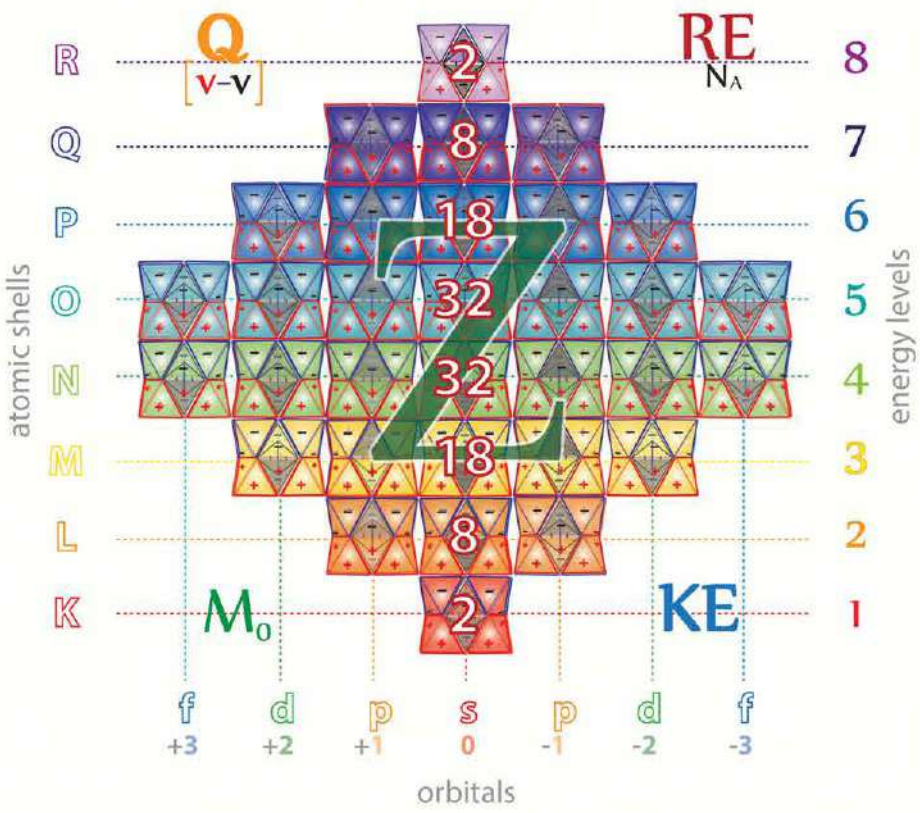
The graph below is a plot of neutron number against proton number.
It is used as rule to determine which nuclei are stable or unstable.


Plot of Baryon numbers based on excess Neutron model of periodic elements
stability line
unstable nuclides
Deviation from Tetryonic plot is the result of the intrinsic mass-energies of each particle comprising the atomic nucleus
E=mc²
Plot of Baryonic nuclei numbers based on Tetryonic topologies of periodic elements
Neutrons = Protons
Neutron Number [Z]
Proton Number [Z]
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Historically, Proton-electron numbers are viewed as being equivalent in neutral elementary matter with the excess molar mass measured being the result of 'excess or extra' Neutrons in the atom

Atomic Nuclei Numbers

All periodic elements have an EQUAL number of Protons, Neutrons & Electrons with their molar mass-Matter being determined by their quantum level mass-energies



Tetryonic modelling of the charged mass-ENERGY-Matter topologies of elementary atoms and the nuclei that comprise them, reveals a DIRECT LINEAR relationship for the number of Protons-electrons-Neutrons in all periodic elements and nuclear isotopes

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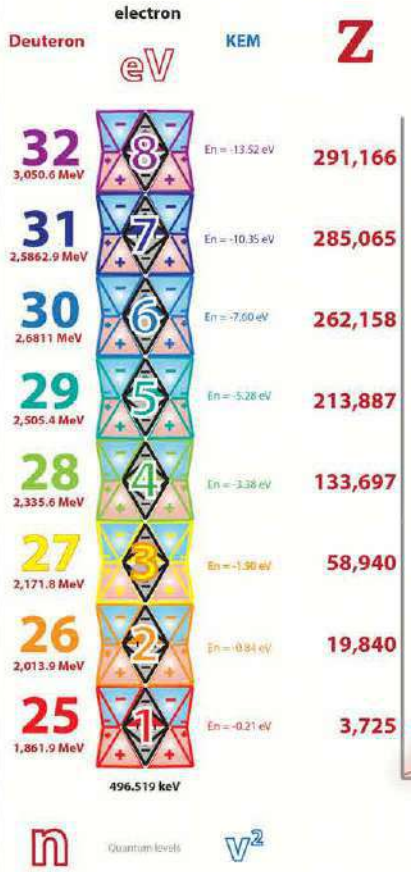
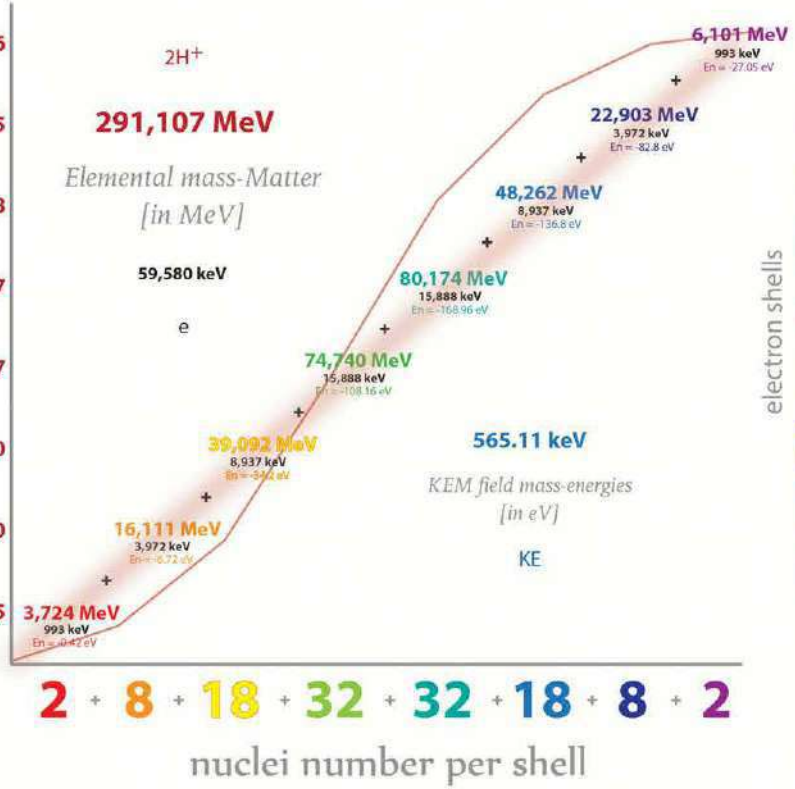
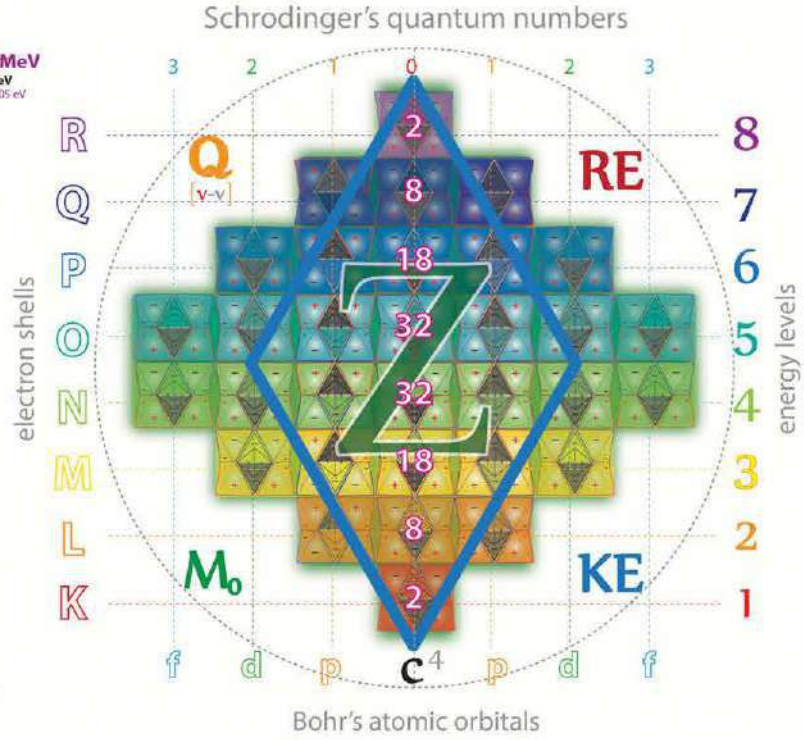
Planck mass-energy contributions to elementary Matter and isotopes



The mass-energy content of Deuterium nuclei creates the molar mass of elements
[not extra neutrons in excess of the elemental number]





n1 Elementary nuclei

are comprised of equal numbers of Protons, Neutrons & electrons with varying energy levels

Baryons		electrons		KEM fields
930.947 MeV	+	496.519 keV	+	13.525 ev

The mass-energy content of Matter topologies is velocity invariant

The mass-energy content of Baryons determines the KEM field of electrons

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All elements are comprised of n level Duetrium nuclei

Baryons **KEM fields** **electrons**

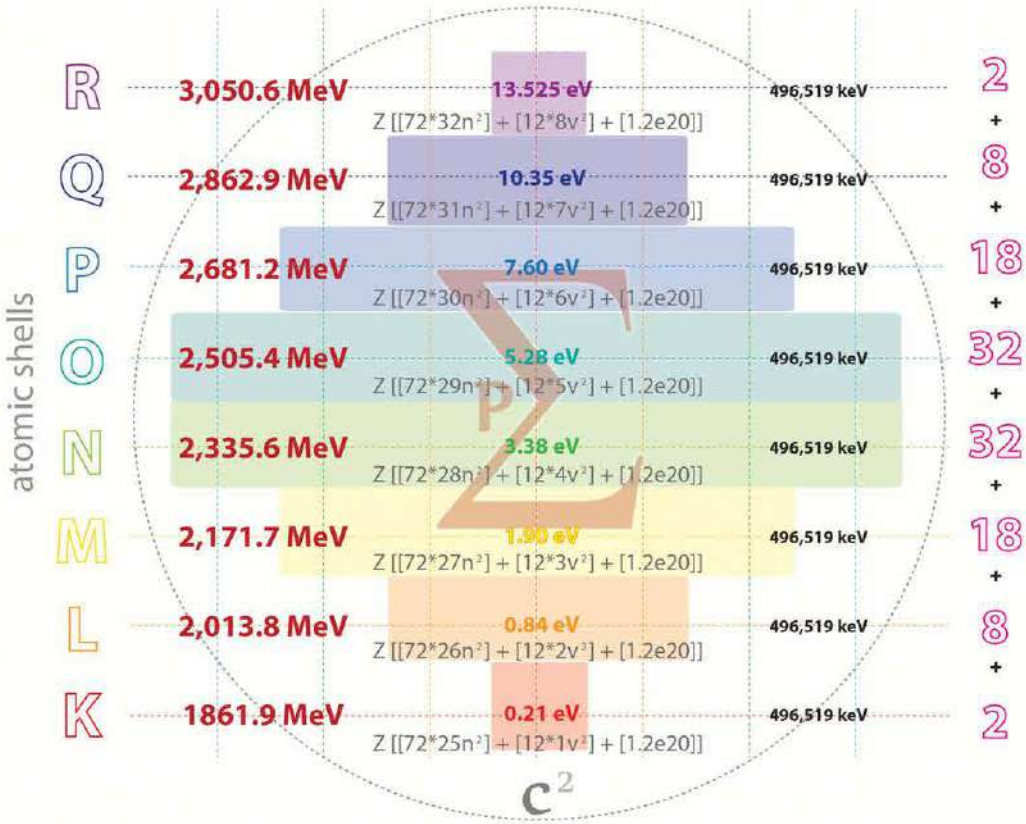
$$Z\,[[72n^2] + [12v^2] + [1.2e20]]$$

1,861,949 MeV **13.525 eV** **496,519 keV**

$2H^+$ $[72n^2]$ Z γ $[M_e v^2]$

Elemental mass-Matter [in MeV]

The atomic shell energy levels of Deuterium nuclei in elements



6,101 MeV
993 keV
En = -27.05 eV
+
22,903 MeV
3,972 keV
En = -82.8 eV
+
48,262 MeV
8,937 keV
En = -316.8 eV
+
80,174 MeV
15,888 keV
En = -168.96 eV
+
74,740 MeV
15,888 keV
En = -108.16 eV
+
39,092 MeV
8,937 keV
En = -34.2 eV
+
16,111 MeV
3,972 keV
En = -6.72 eV
+
3,724 MeV
993 keV
En = -0.42 eV

$[1.2e20]]$

e

Determines the spectral line [KEM field energies] of electrons bound to them

The relativistic rest mass-energy-Matter of all periodic elements

is the sum of the mass-energies of all atomic nuclei and spectral lines that comprise its mass-Matter topology as measured in any spatial co-ordinate system per unit of time

the rest mass-Matter of bound photo-electrons is velocity invariant

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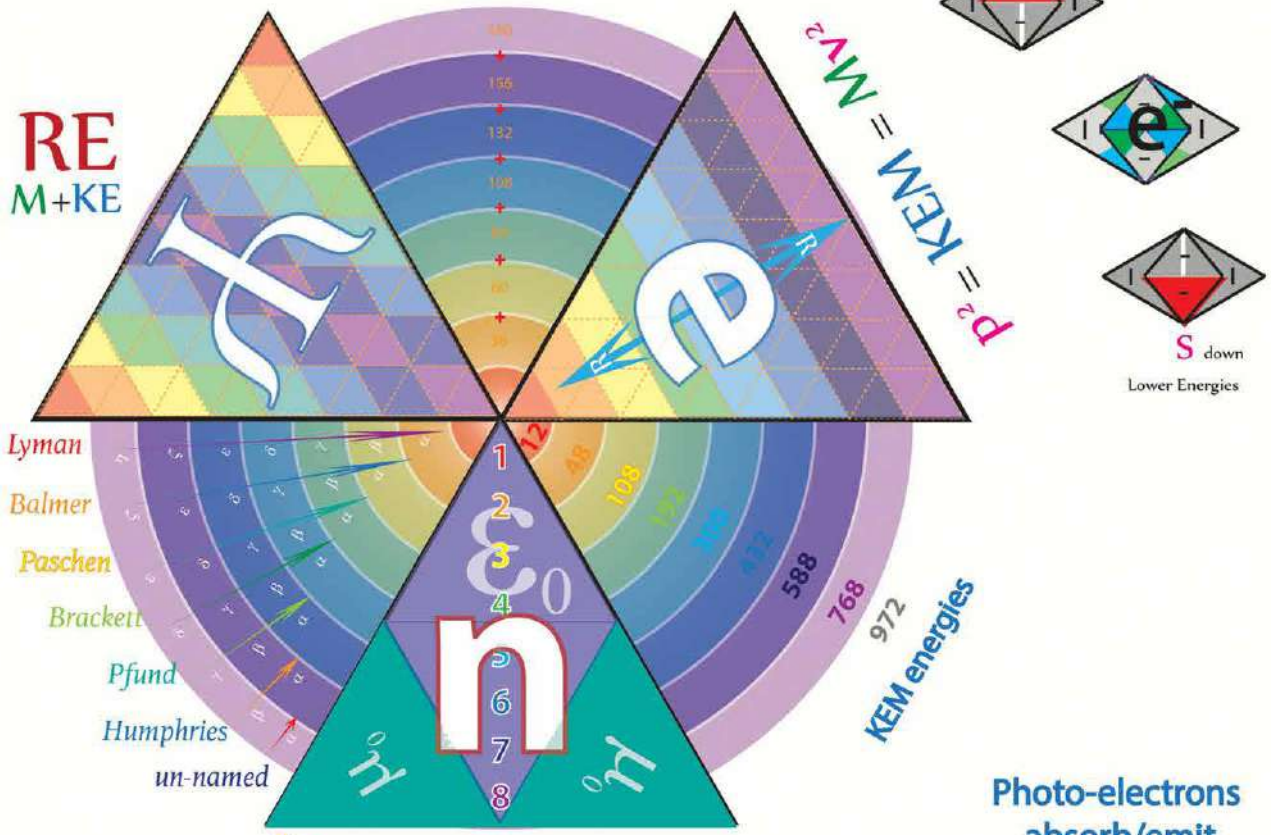
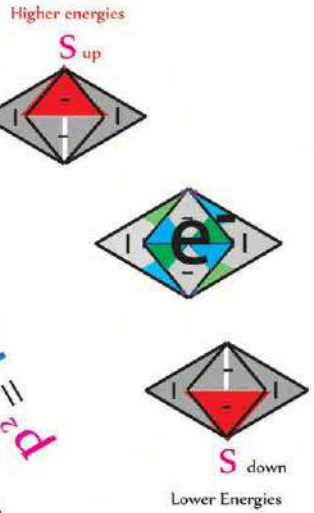
Ionisation energies

Fractional quantum differentials





Note: this is an Illustrative schema for modelling KEM field energies
All KEM fields possess the same physical spatial geometry
in radial-time defined spatial co-ordinate systems

c^2 c^4

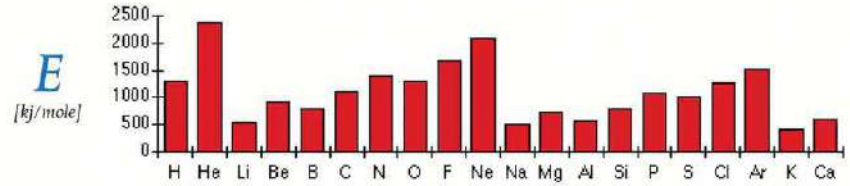
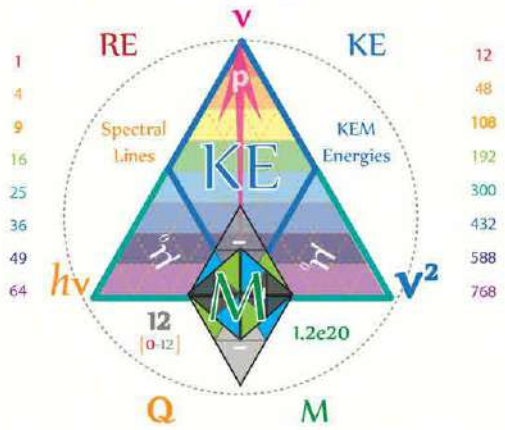


Photo-electrons absorb/emit spectral energies

$$E = eV = \frac{1}{4\pi\epsilon_0}\frac{ne^2}{a}$$

photo-electronic energy momenta

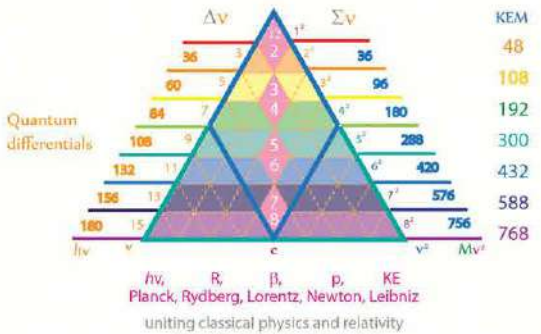


Mapping photo-electron transition energies to Tetryonic energy momenta geometries reveals many key facts about the ionisation energies of nuclei

$$E = -\frac{Z^2}{n^2}\frac{ke^2}{2a_0} = -\frac{13.6Z^2}{n^2}eV$$

The differing fractional KEM field energy momenta of electrons that results from their transitions to specific energy nuclei in elements results in differing QAM quanta and produces spectral lines and fine line splitting

Spectral line transitions


Δν
Σν
KEM
Quantum differentials
36 60 84 108 132 156 180
36 96 180 288 420 576 756
48 108 192 300 432 588 768
hν, R, β, p, KE
Planck, Rydberg, Lorentz, Newton, Leibniz

uniting classical physics and relativity through equilateral geometry

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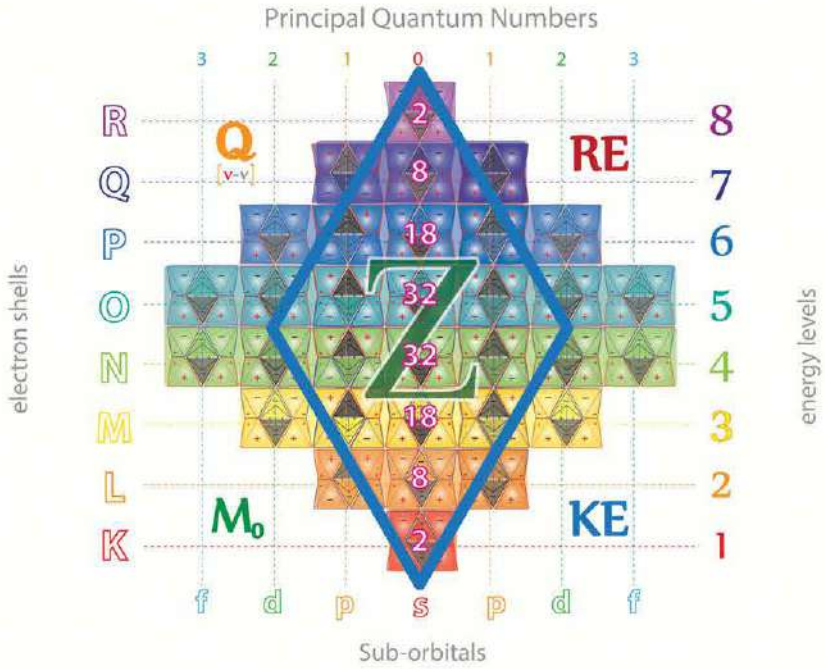
Element numbers

Nuclei per shell in elements follow a 'periodic summation rule' that is reflective of photonic energies

$$\sum_{K}^{R} 2(x^2) = 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2$$

$$Z$$

120	Unbinilium	n8
119	Ununennium	
118	Ununoctium	n7
87	Francium	
112	Copernicium	n6
55	Caesium	
102	Nobelium	n5
37	Rubidium	
70	Ytterbuim	n4
19	Potassium	
30	Zinc	n3
11	Sodium	
10	Neon	n2
3	Lithium	
2	Helium	n1
1	Deuterium	
Hydrogen	0	



Periodic mass-ENERGY-Matter

Following periodic summation rules for shell filling n[1-8] quantum energy deuterium nuclei combine to form elementary Matter

$$\sum_{K}^{R} \left[[72(n)^2] + [12e19] + [m_e v^2] \right]_{1}^{8} \quad (25 \text{ to } 32)$$

Baryon rest masses · lepton rest mass · KEM

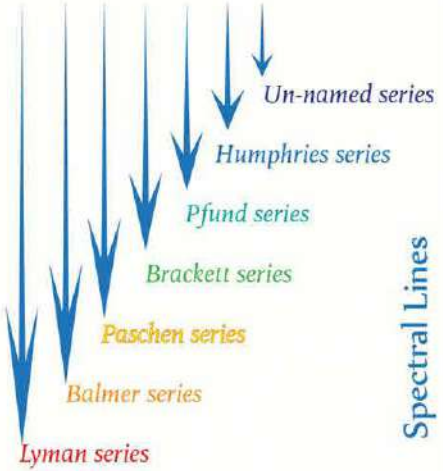
Deuterium mass-energy per shell

The measured weight of Matter in gravitational fields is the result of planar mass-energies in tetryonic standing-wave geometries

The periodicity of all the elements, along with their exact molar rest mass-energies and quantum wavefunctions can be described with Tetryonic geometries

Ionisation energies

$$\gamma$$



$$Mv^2 = KEM = hcR_H$$

Photon emission/absorption

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Spectral line differentials

$$\Delta hv = \Delta Mv = \Delta p$$

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

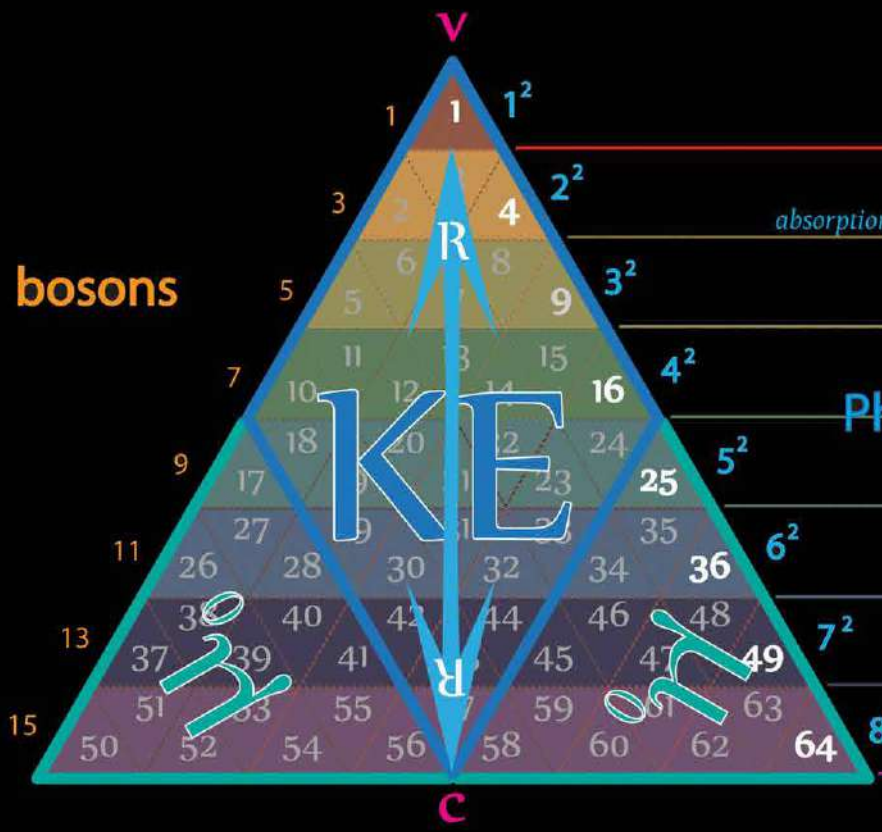
changes to energy momenta

accelerate photo-electrons

Ryberg's formula is
a mathematical description
of Tetryonic energy geometry

& produces spectral lines

Δhf



absorption $\frac{n_i^2}{n_f^2}$ **Fractional energy level transitions** $\frac{n_f^2}{n_i^2}$ emission

Photo-electrons

	Un-named	Humphries	Pfund	Brackett	Paschen	Balmer	Lyman
	15/64	28/64	39/64	48/64	55/64	60/64	63/64
		13/49	24/49	33/49	40/49	45/49	48/49
			11/36	20/36	27/36	32/36	35/36
				9/25	16/25	21/25	24/25
					7/16	12/16	15/16
						5/9	8/9
							3/4

Ryberg's constant reflects the changing
energy momentum of a transitioning electron

$$Mv^2 = KEM = hcR$$

All of the transitions of photo-electrons bound to Hydrogen atoms can now be revealed in the fractional geometry of KEM field energies

KEM field energies

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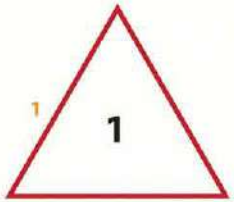
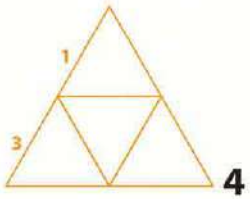
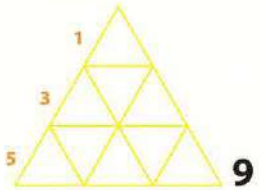
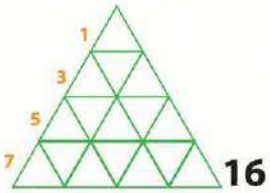
Fermat's method of Factoring

also known as 'the difference of two squares' is used to factorise large numbers









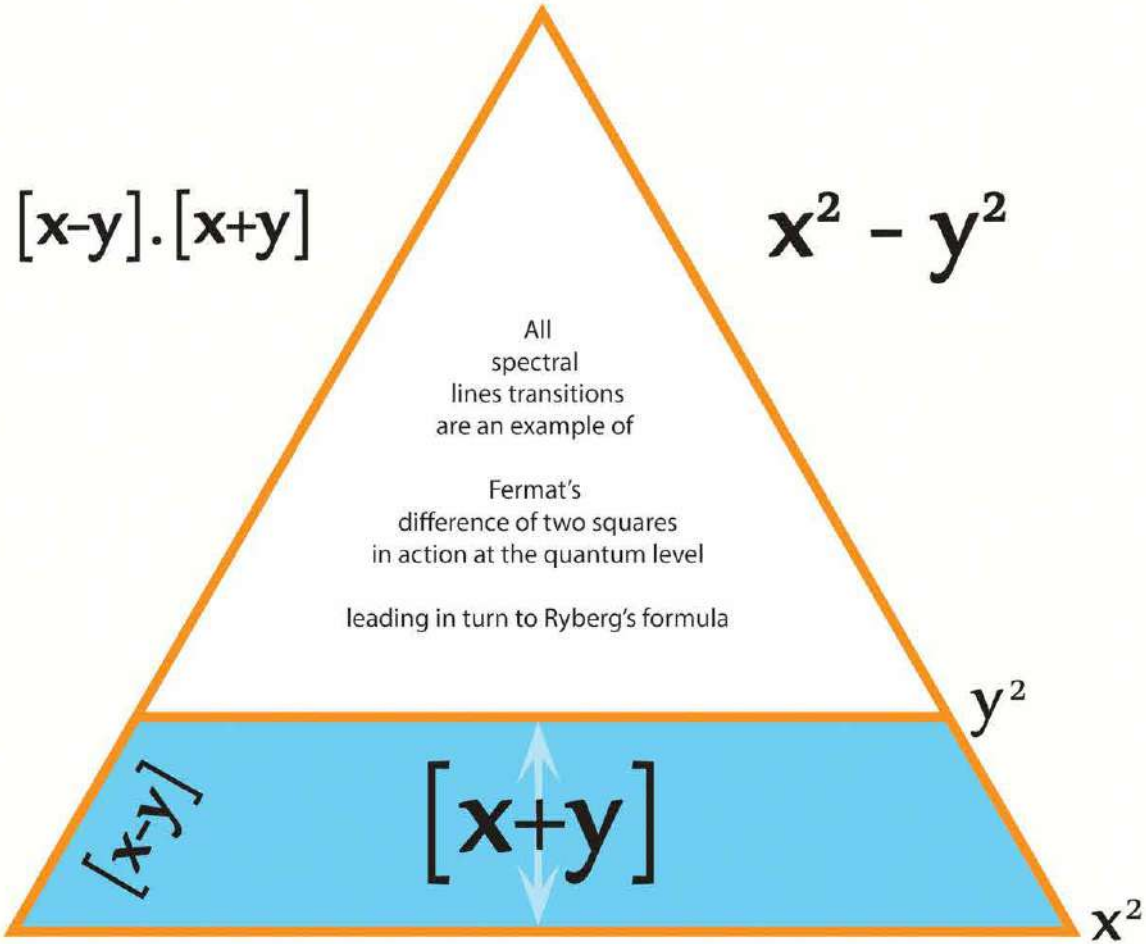
$[x-y].[x+y]$

$x^2 - y^2$

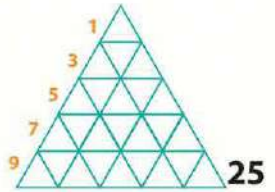
All
spectral
lines transitions
are an example of

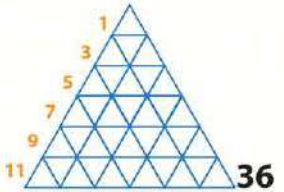
Fermat's
difference of two squares
in action at the quantum level

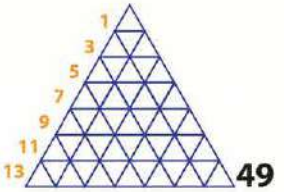
leading in turn to Ryberg's formula

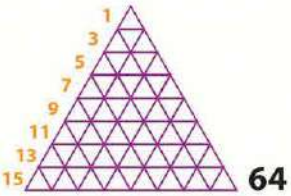


Fermat knew that every odd number could be written as the difference of two squares
or as revealed geometrically through Tetryonic theory's equilateral geometry,
every 'SQUARE' number is the sequential sum of ODD numbers









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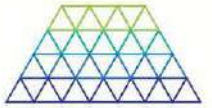
Fractions

A fraction is a number that shows how many equal parts there are

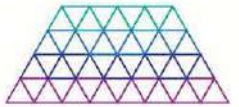
In quantum mechanics fractions appear in quantum steps
as a result of the equilateral geometry of Planck energy momenta

3/4

24/25



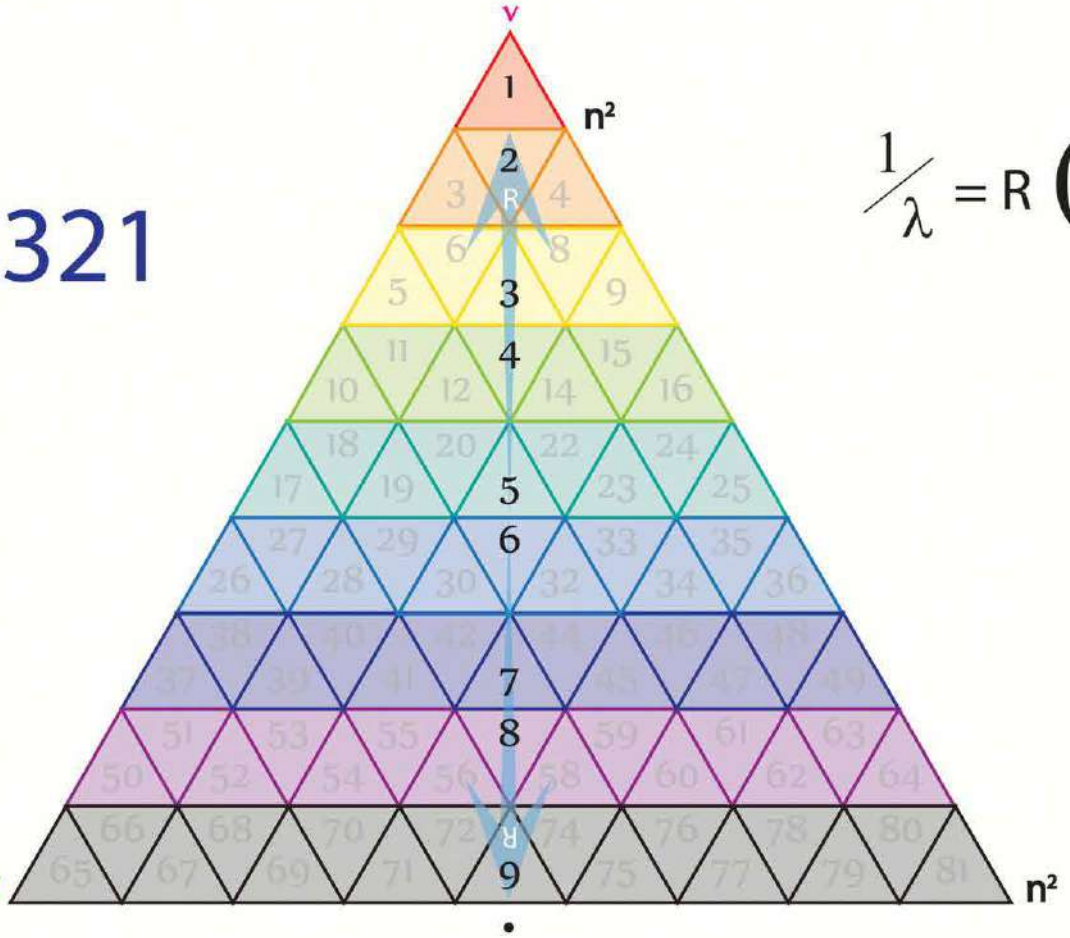
40/49



48/64

80/81

.987654321



$$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{81}\right)$$

.987654321

Cos 60

.5

1/2

Sin 60

.866025403

$\sqrt{3/2}$

Tetryonic geometry explains the fractional mathematics of Rydberg's formula

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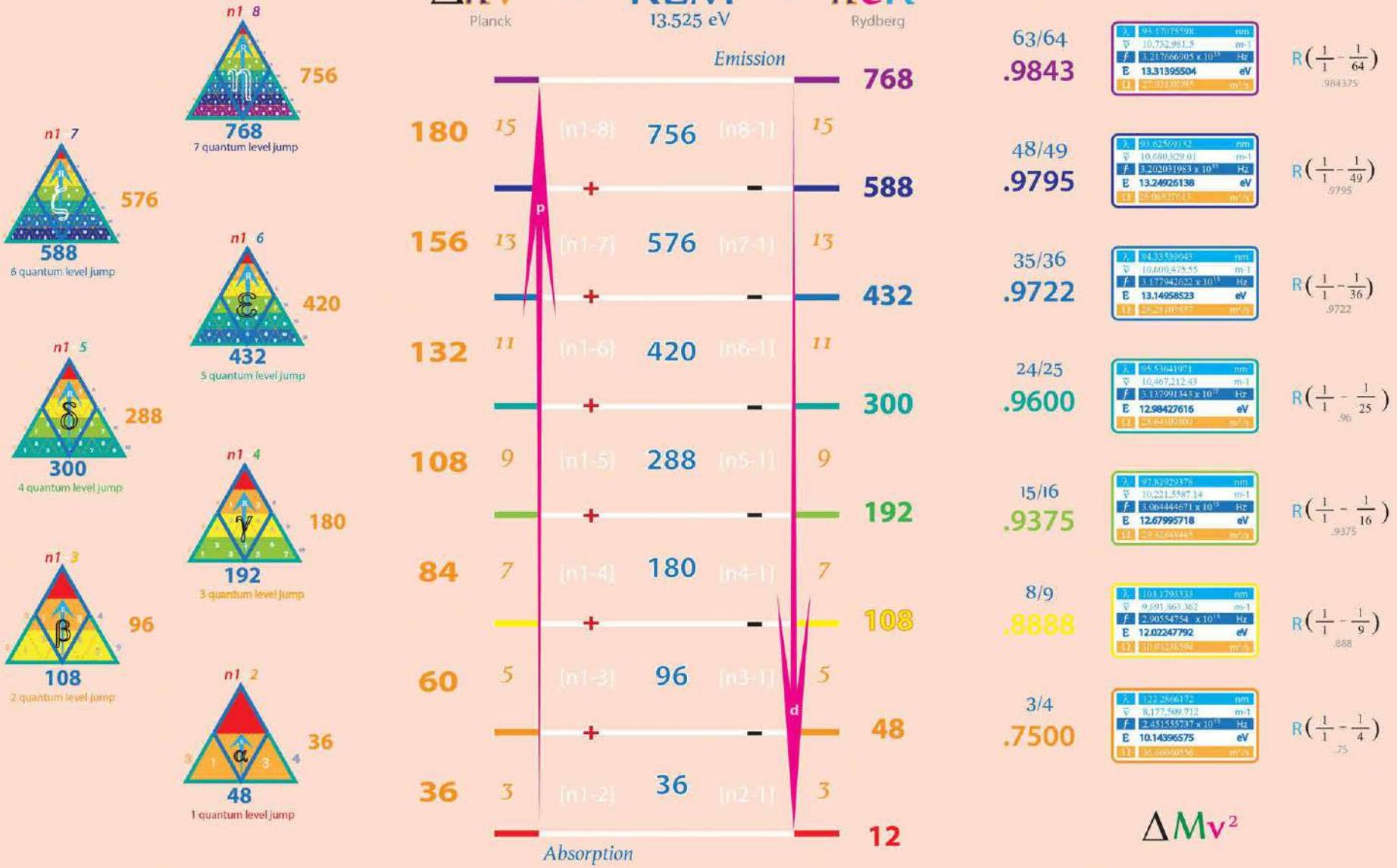
Lyman spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 13.525 eV — Rydberg



63/64	.9843	$R\left(\frac{1}{1}-\frac{1}{64}\right)$ .984375
48/49	.9795	$R\left(\frac{1}{1}-\frac{1}{49}\right)$ .9795
35/36	.9722	$R\left(\frac{1}{1}-\frac{1}{36}\right)$ .9722
24/25	.9600	$R\left(\frac{1}{1}-\frac{1}{25}\right)$ .96
15/16	.9375	$R\left(\frac{1}{1}-\frac{1}{16}\right)$ .9375
8/9	.8888	$R\left(\frac{1}{1}-\frac{1}{9}\right)$ .888
3/4	.7500	$R\left(\frac{1}{1}-\frac{1}{4}\right)$ .75

$$\Delta Mv^2$$

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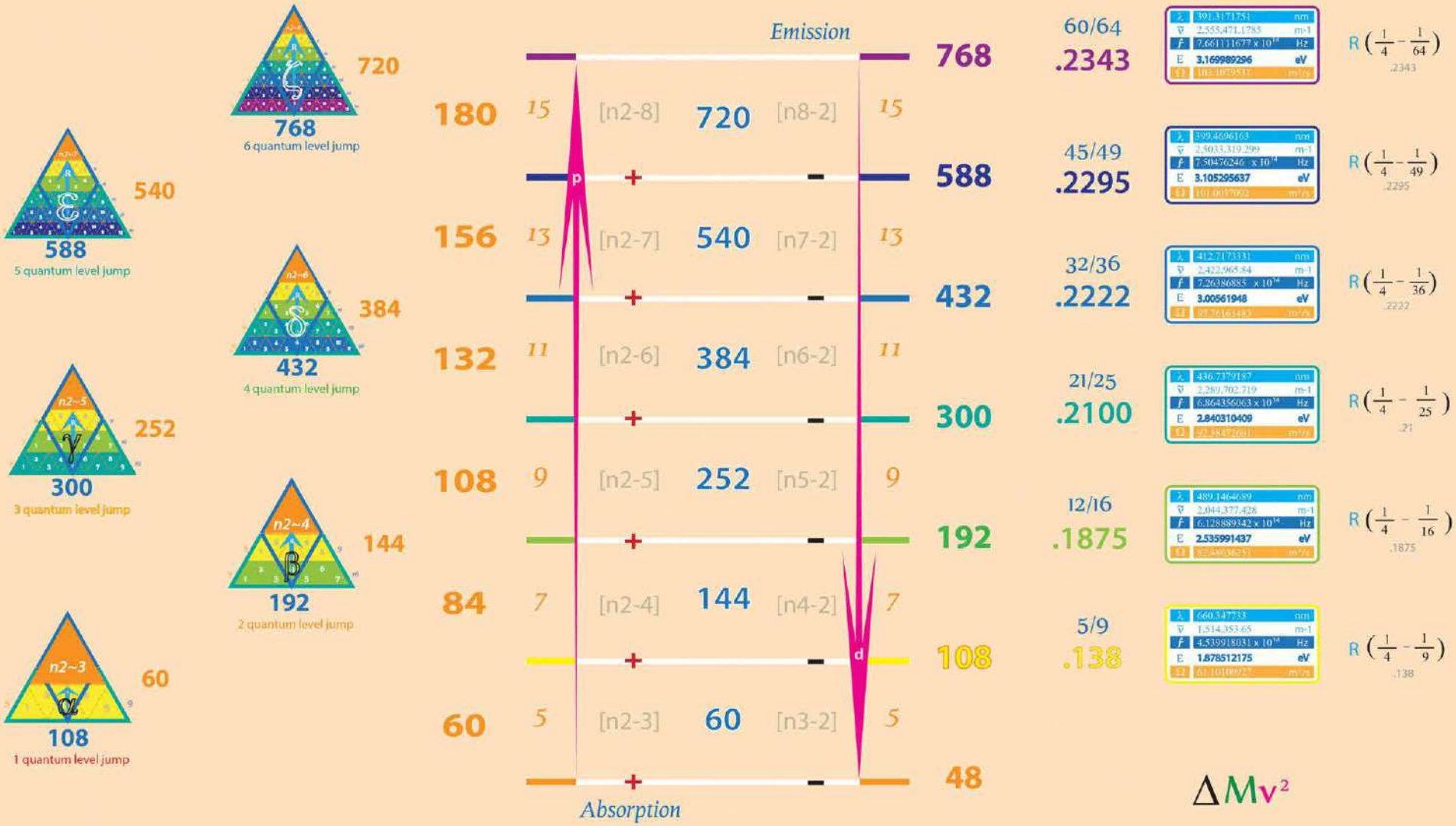
Balmer spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 3.381 eV — Rydberg



$R\left(\frac{1}{4}-\frac{1}{64}\right)$ .2343

$R\left(\frac{1}{4}-\frac{1}{49}\right)$ .2295

$R\left(\frac{1}{4}-\frac{1}{36}\right)$ .2222

$R\left(\frac{1}{4}-\frac{1}{25}\right)$ .21

$R\left(\frac{1}{4}-\frac{1}{16}\right)$ .1875

$R\left(\frac{1}{4}-\frac{1}{9}\right)$ .138

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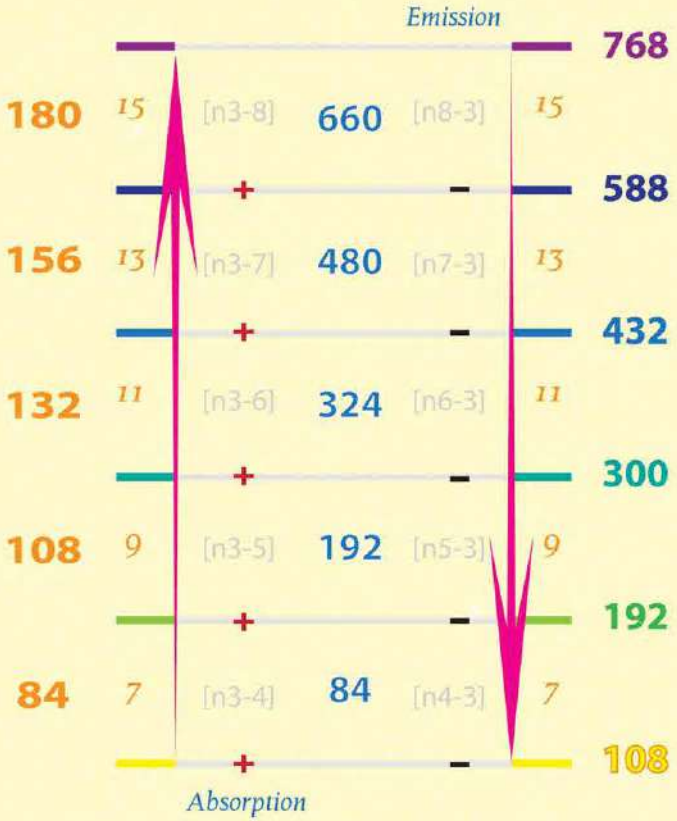
Paschen spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 1.502 eV — Rydberg



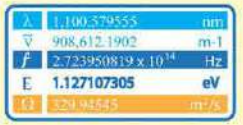
55/64
.0954

$R\left(\frac{1}{9}-\frac{1}{64}\right)$ .09548

40/49
.0907

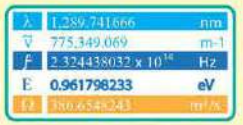
$R\left(\frac{1}{9}-\frac{1}{49}\right)$ .0907

27/36
.8033



$R\left(\frac{1}{9}-\frac{1}{36}\right)$ .0833

16/25
.0711



$R\left(\frac{1}{9}-\frac{1}{25}\right)$ .0711

7/16
.0486

$R\left(\frac{1}{9}-\frac{1}{16}\right)$ .0486

ΔMv^2

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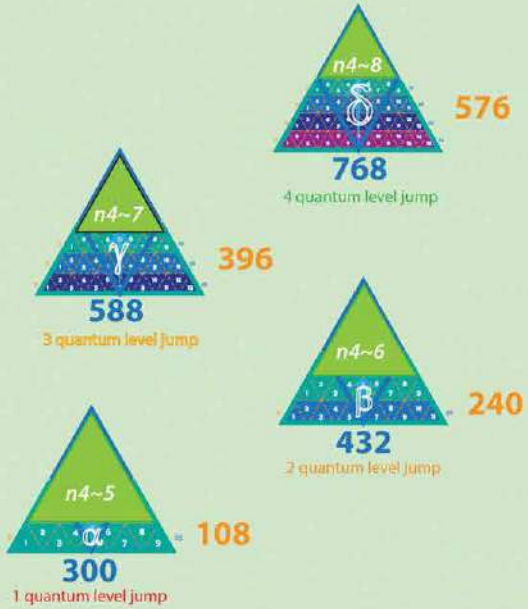
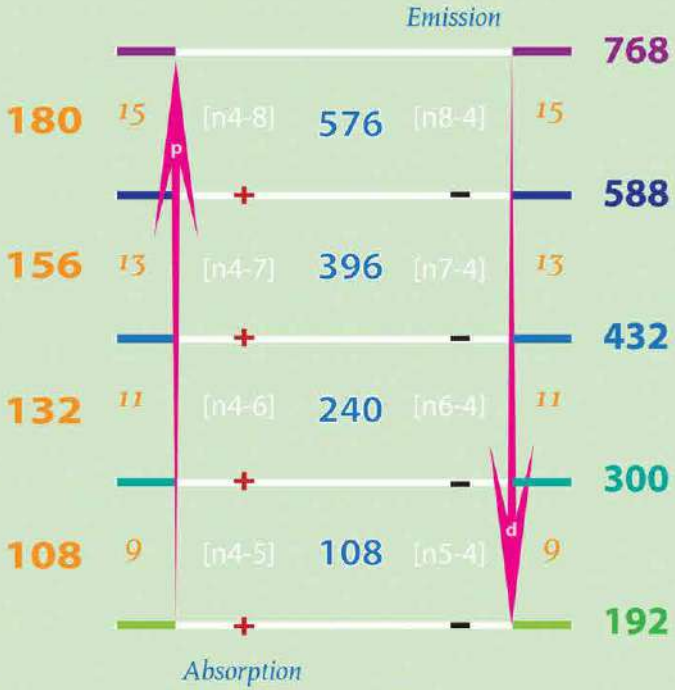
Brackett spectral transitions

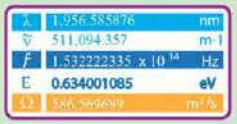
$$\Delta h\nu = KEM = hcR$$

Planck — 0.8451 eV — Rydberg



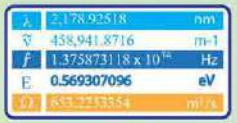


48/64 .0468



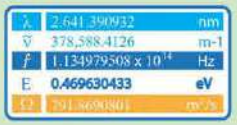
$R\left(\frac{1}{16}-\frac{1}{64}\right)$ .0468

33/49 .04209



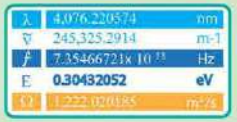
$R\left(\frac{1}{16}-\frac{1}{49}\right)$ .04209

20/36 .0347



$R\left(\frac{1}{16}-\frac{1}{36}\right)$ .0347

9/25 .0225



$R\left(\frac{1}{16}-\frac{1}{25}\right)$ .0225

ΔMv^2

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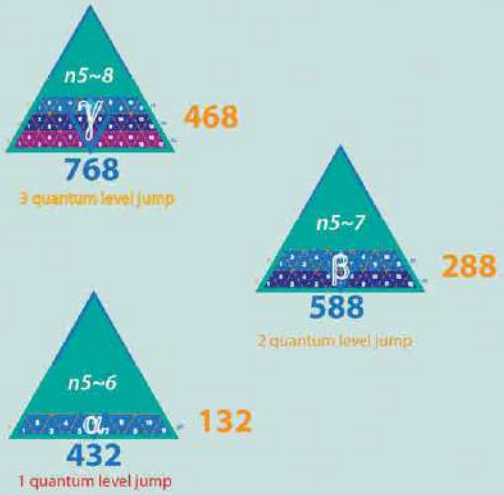
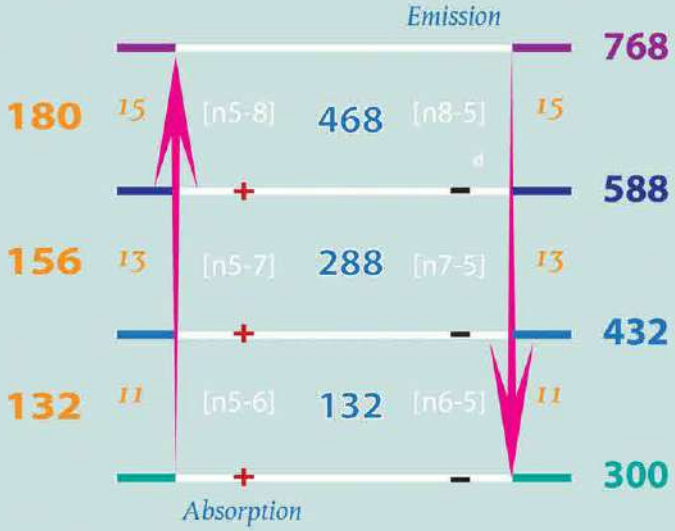
Pfund spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 0.541 eV — Rydberg





39/64 .0243

λ	3,762.665146 nm
ν̃	265,769.0656 m-1
f	7.967556145 x 10^13 Hz
E	0.329678886 eV
Ω	1,125.018633 m²/s

$R\left(\frac{1}{25}-\frac{1}{64}\right)$ .0243

24/49 .0195

λ	4,681.284566 nm
ν̃	213,616.5802 m-1
f	6.404063965 x 10^13 Hz
E	0.264985227 eV
Ω	1,403.413807 m²/s

$R\left(\frac{1}{25}-\frac{1}{49}\right)$ .01959

11/36 .0122

λ	7,503.951512 nm
ν̃	133,263.1212 m-1
f	3.995127867 x 10^13 Hz
E	0.165309071 eV
Ω	2,249.628068 m²/s

$R\left(\frac{1}{25}-\frac{1}{36}\right)$ .0122

ΔMv^2

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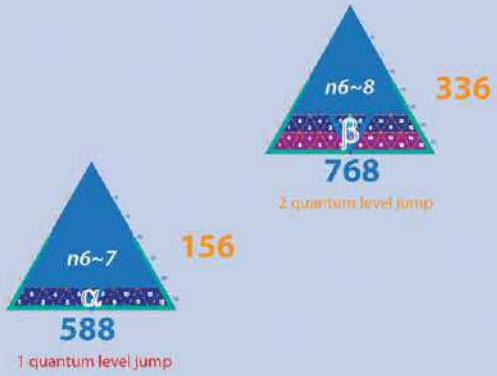
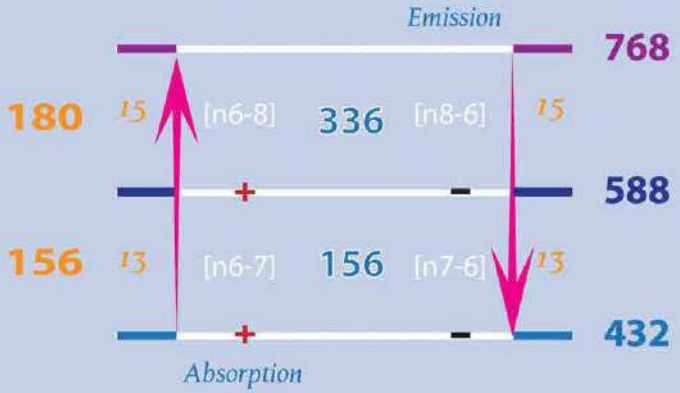
Humphreys spectral transitions

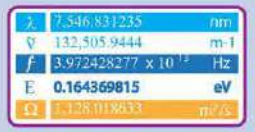
$$\Delta h\nu = KEM = hcR$$

Planck — 0.375 eV — Rydberg





28/64
.01215



$R\left(\frac{1}{36}-\frac{1}{64}\right)$ .01215

13/49
.00733

$R\left(\frac{1}{36}-\frac{1}{49}\right)$ .0073

ΔMv^2

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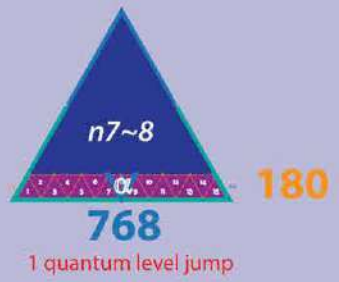
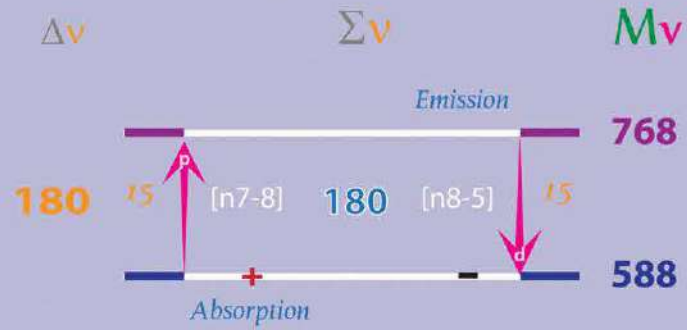
Un-named spectral transition

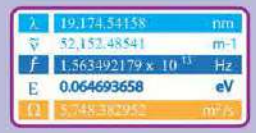
$$\Delta h\nu = KEM = hcR$$

Planck — 0.276 eV — Rydberg





15/64
.0047



$R\left(\frac{1}{49}-\frac{1}{64}\right)$ .0047

$\Delta M\nu^2$

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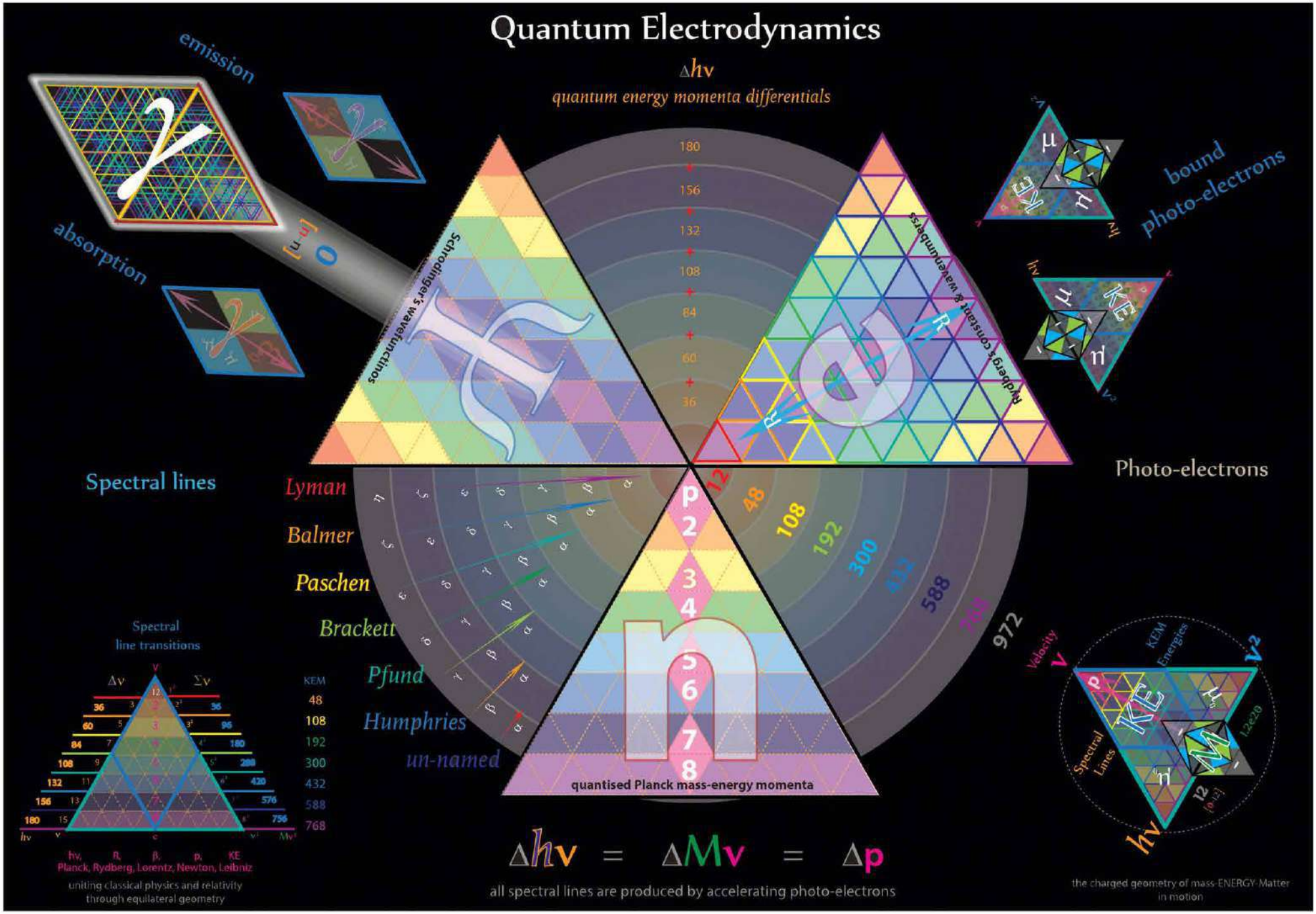

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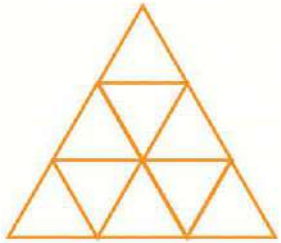
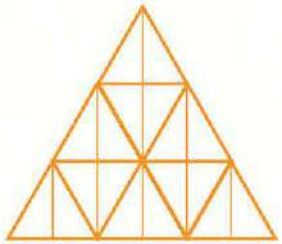
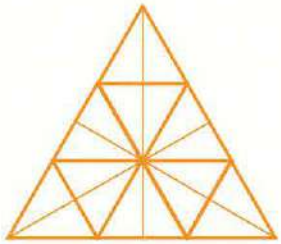
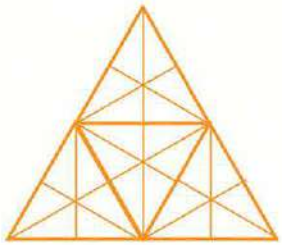
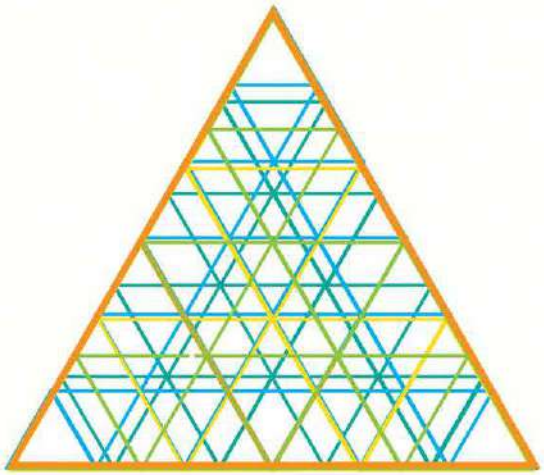

ninths


eigteenths

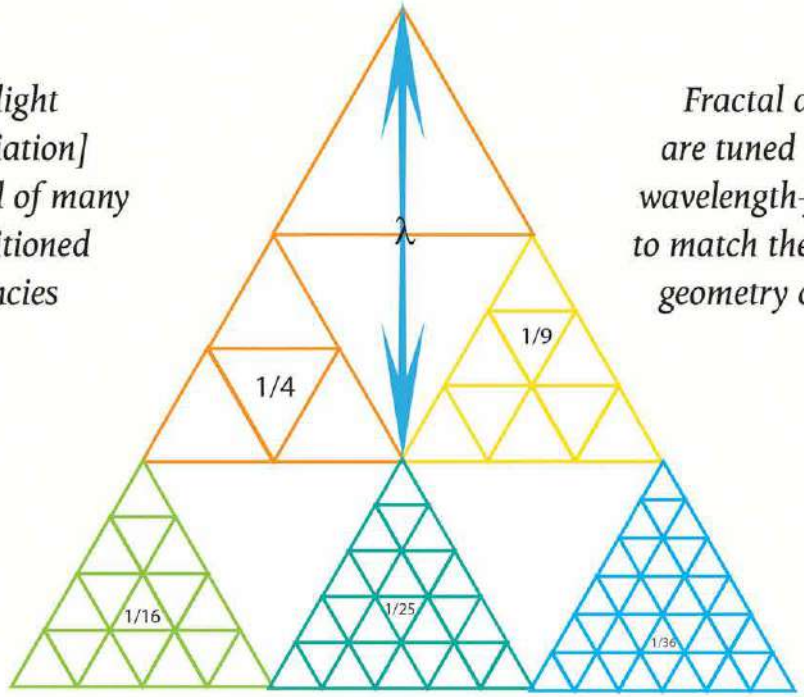

Eighteenths


Twenty-fourths

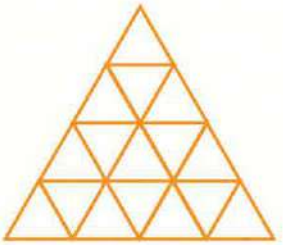


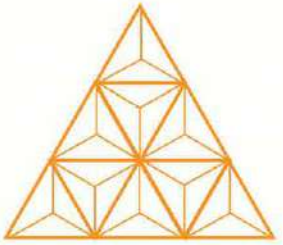
Fractionals and fractals

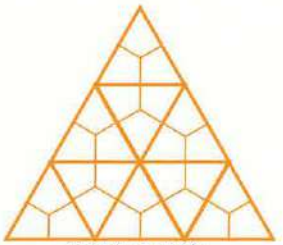
White light [EM radiation] is comprised of many superpositioned frequencies

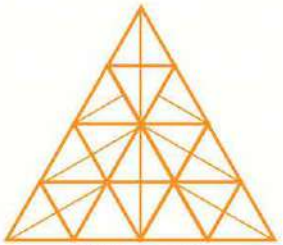


Fractal antennas are tuned to specific wavelength-frequencies to match the equilateral geometry of photons


Sizteenths


Twenty-sevenths


Twenty-sevenths


Thirty-seconds

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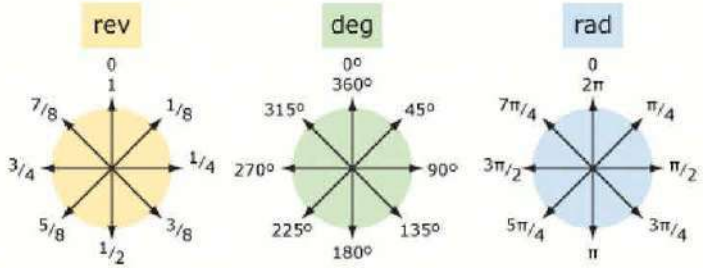
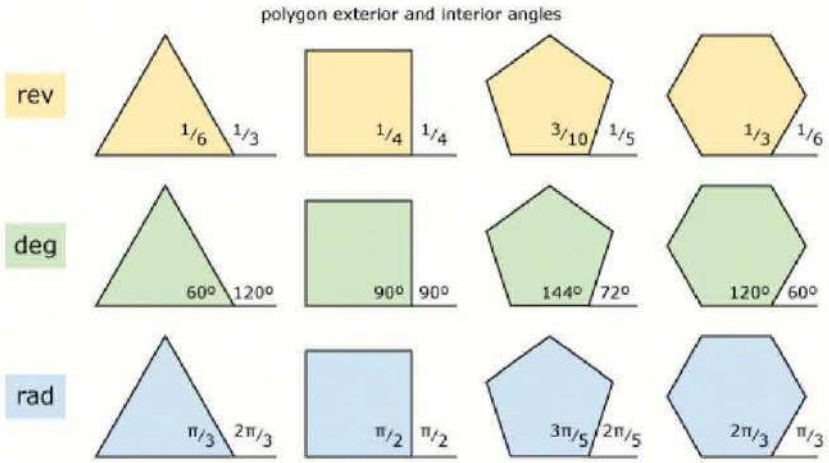
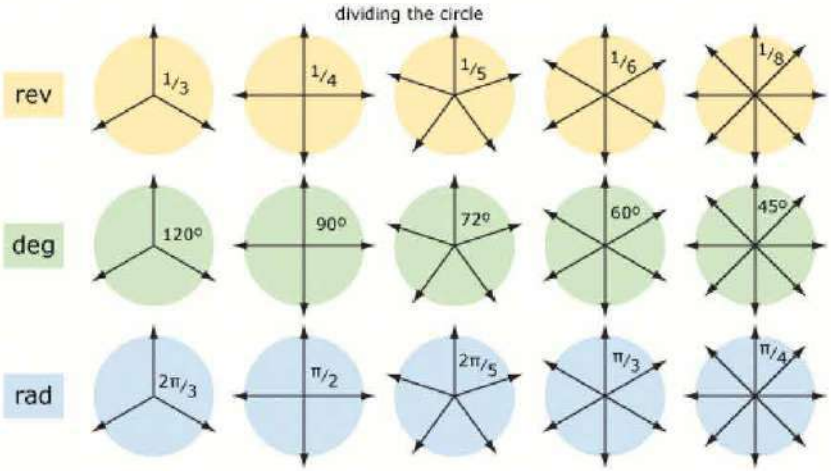
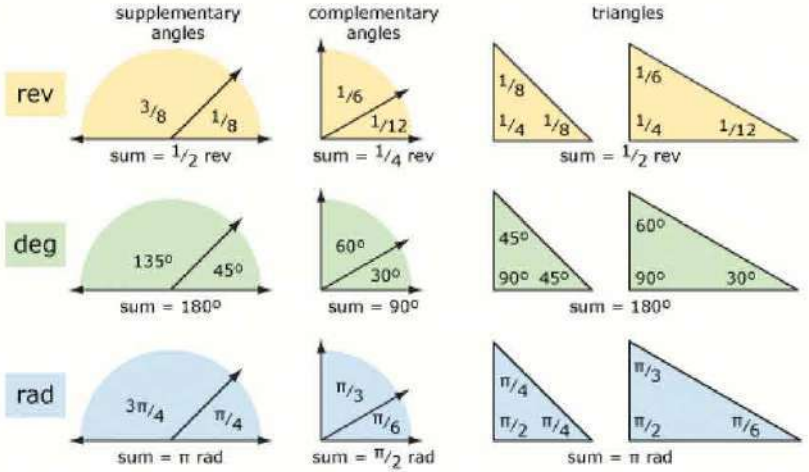
Polygons and Angles









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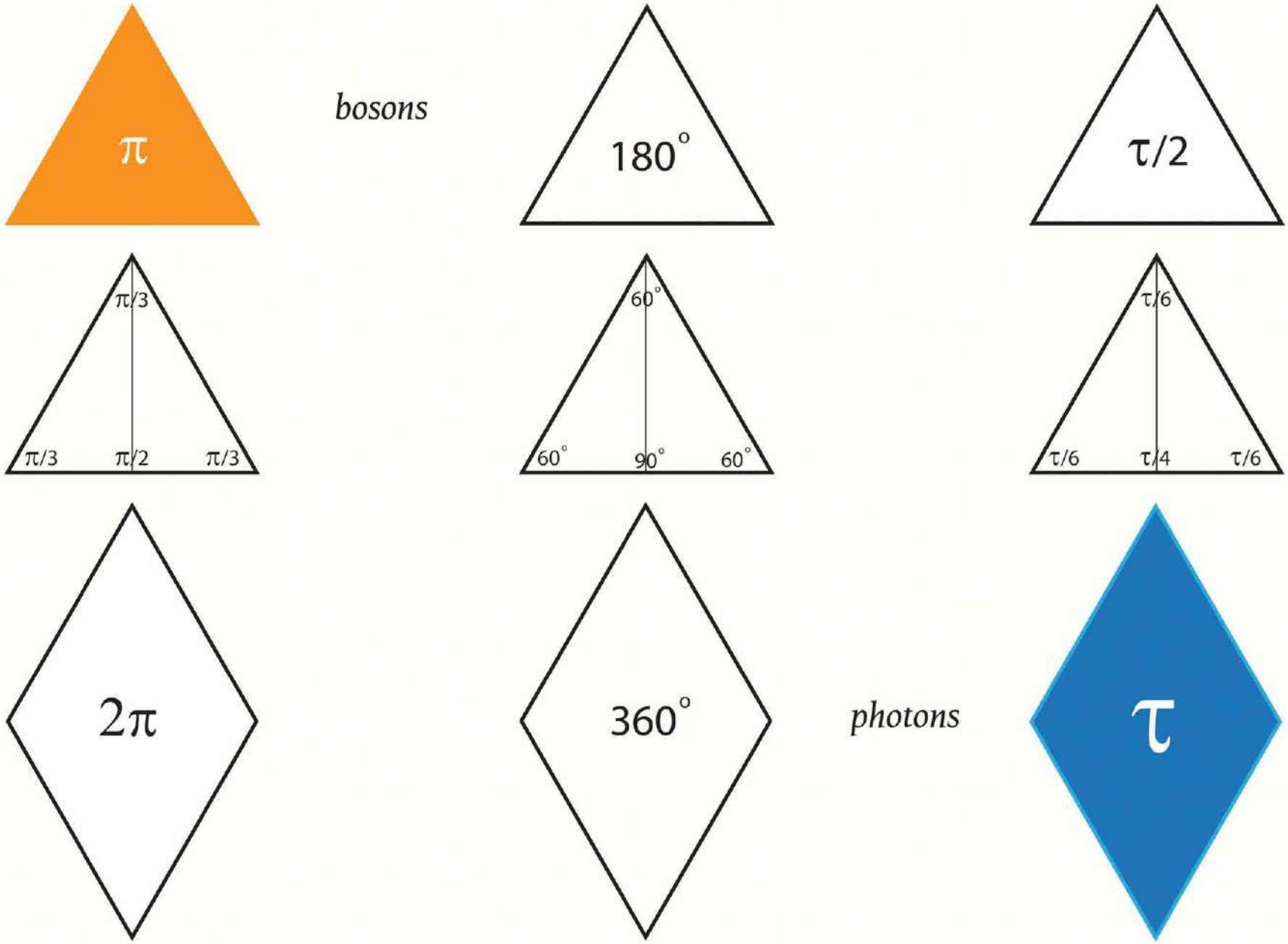
Pi vs Tau



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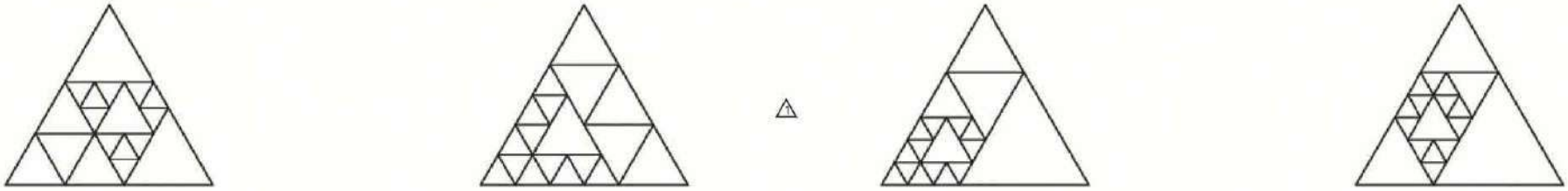
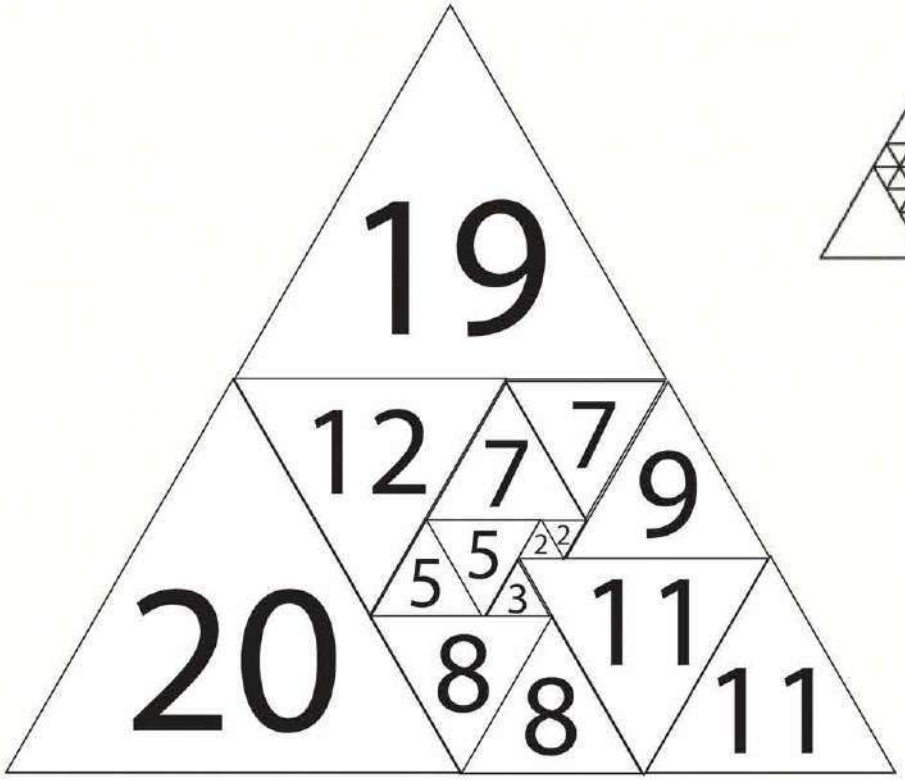
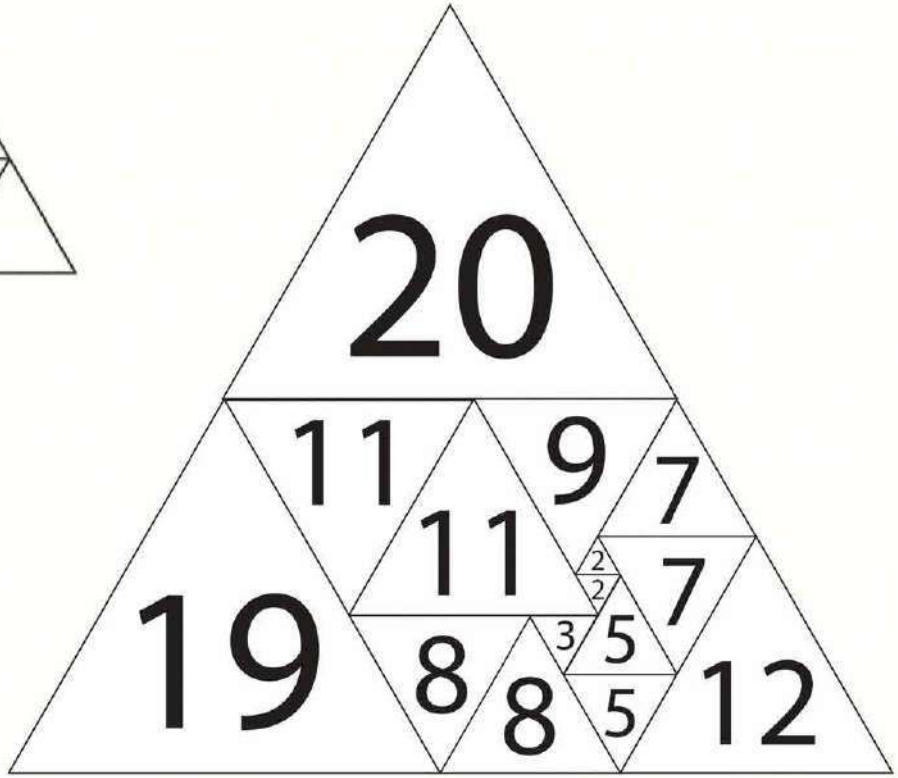
Triangular dissection of an equilateral triangle

is a way of dividing up a original triangle into smaller equilateral triangles,
such that none of the smaller triangles overlap





lowest order perfect equilateral triangle dissected by equilateral triangles



lowest order perfect dissected equilateral triangle, an isomer of the first

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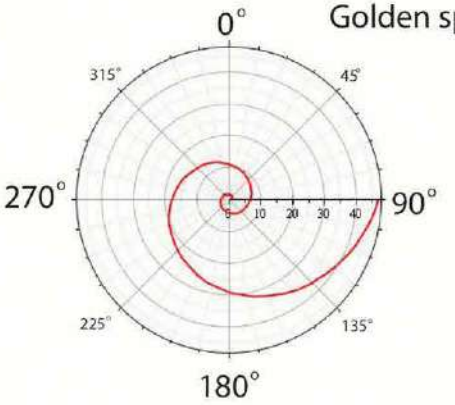
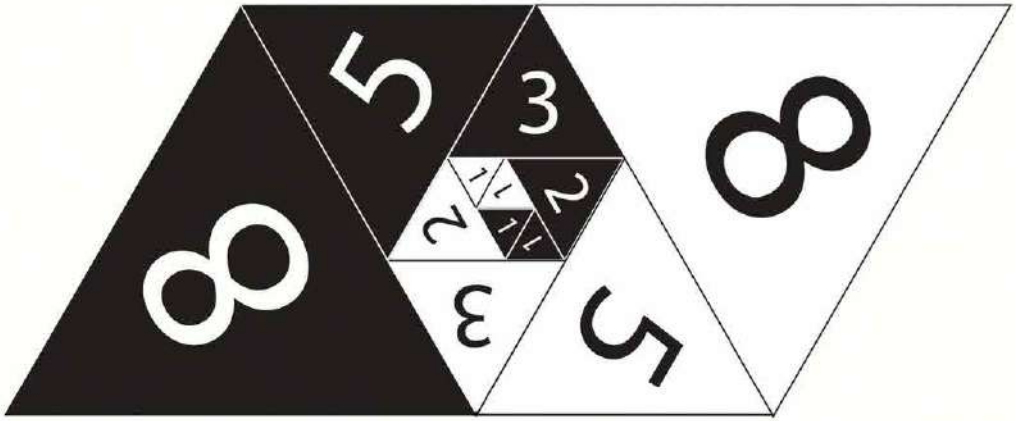
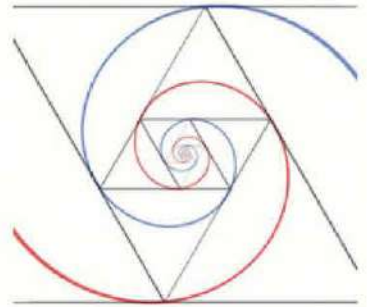
Golden mean Spirals

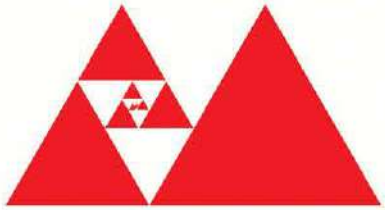
Golden Mean Spiral – This spiral is derived via the golden rectangle, a unique rectangle which has the golden ratio.
This form is found everywhere in nature: the Nautilus Shell, the face of a Sunflower, fingerprints, our DNA, and the shape of the Milky Way

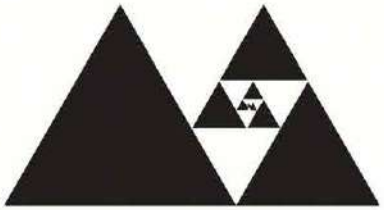


0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...









Continued fractions and the Fibonacci sequence

The convergence of the continued fractions

$$1 + \cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cdots}}}}}}}}}}}}}}}}$$

are:

$$\frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, \frac{55}{34}, \frac{89}{55}, \frac{144}{89}, \frac{233}{144}, \frac{377}{233}, \frac{610}{377},$$

The Golden Ratio (Golden Mean, Golden Section)
is defined mathematically as:

$$\varphi = \frac{1+\sqrt{5}}{2} = 1.6180339887\ldots.$$

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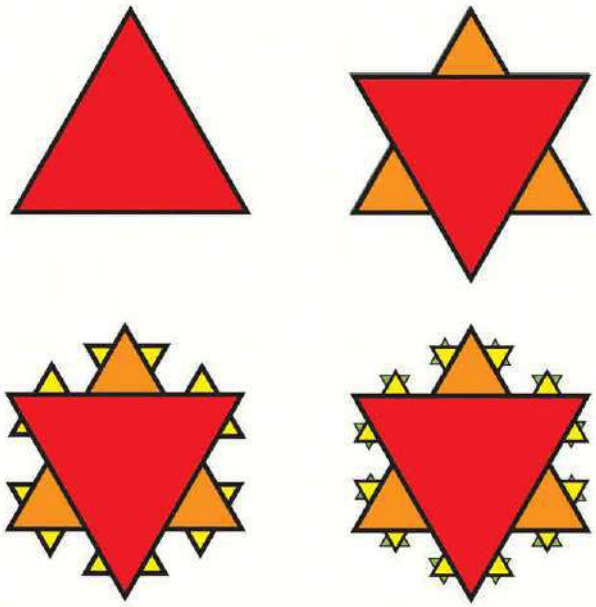
Koch fractal Curve

Niels Fabian Helge von Koch (January 25, 1870 – March 11, 1924) was a Swedish mathematician who gave his name to one of the earliest fractal curves ever known

He described the Koch curve, or Koch snowflakes as it popularly known, in a 1904 paper entitled "On a continuous curve without tangents constructible from elementary geometry"

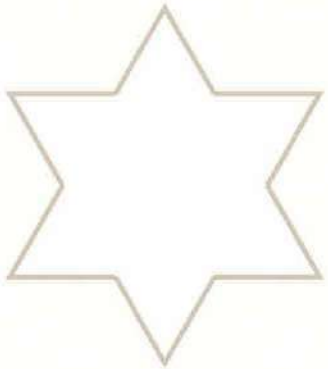
Von Koch wrote several papers on number theory . One of his results was a 1901 theorem proving that the Riemann hypothesis is equivalent to a strengthened form of the prime number theorem.

Three Koch curves form the snowflake.



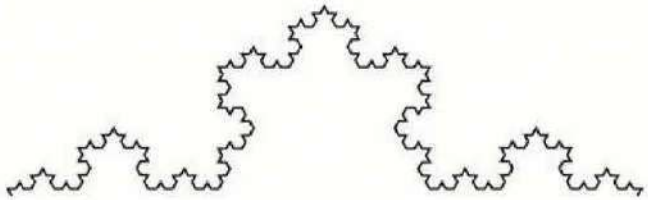
The Koch snowflake (or Koch star) is a mathematical curve and one of the earliest fractal curves to have been described.

Actually Koch described what is now known as the Koch curve, which is the same as the now popular snowflake, except it starts with a line segment instead of an equilateral triangle.

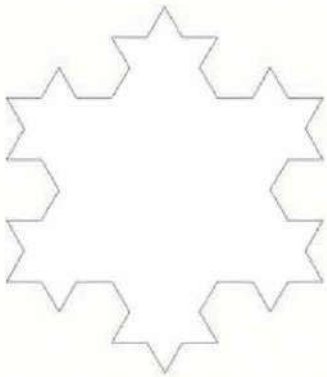


$$a = \frac{1}{2} + \frac{i}{\sqrt{12}}$$

The Koch curve is a special case of the Cesaro curve where:



which is in turn a special case of the de Rham curve.



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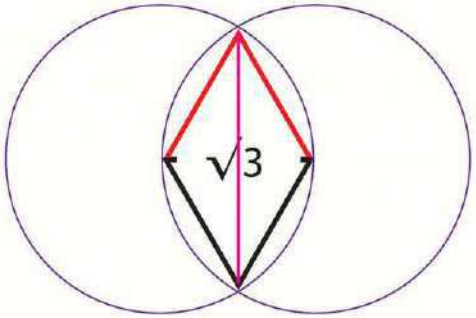
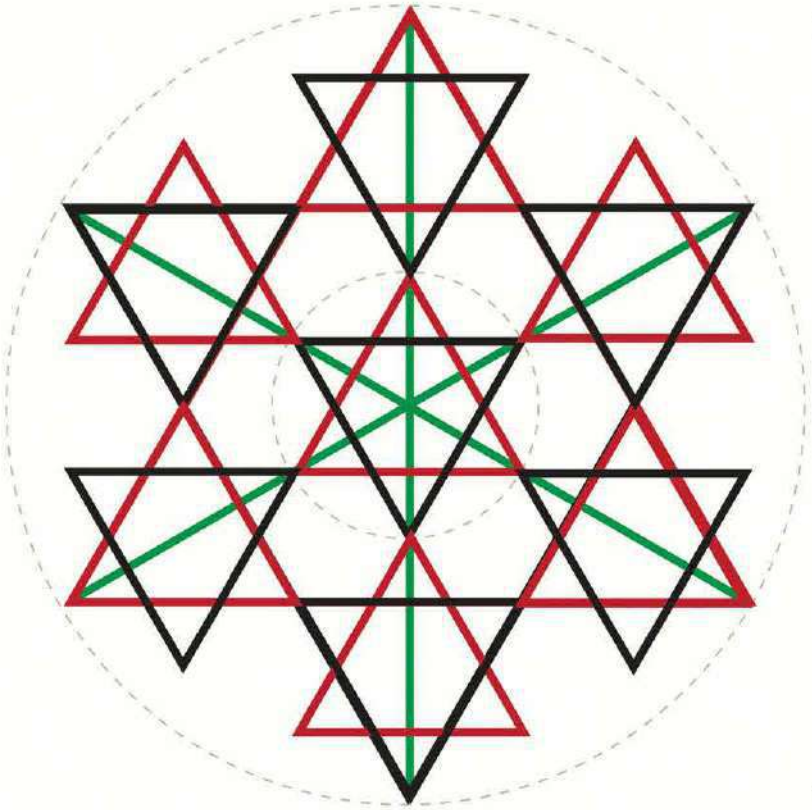


vesica piscis

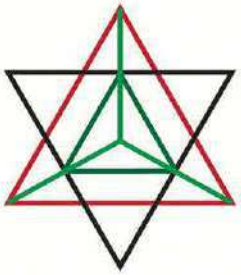
$$\frac{1351}{780} > \sqrt{3} > \frac{265}{153}\,.$$

Koch snowflake

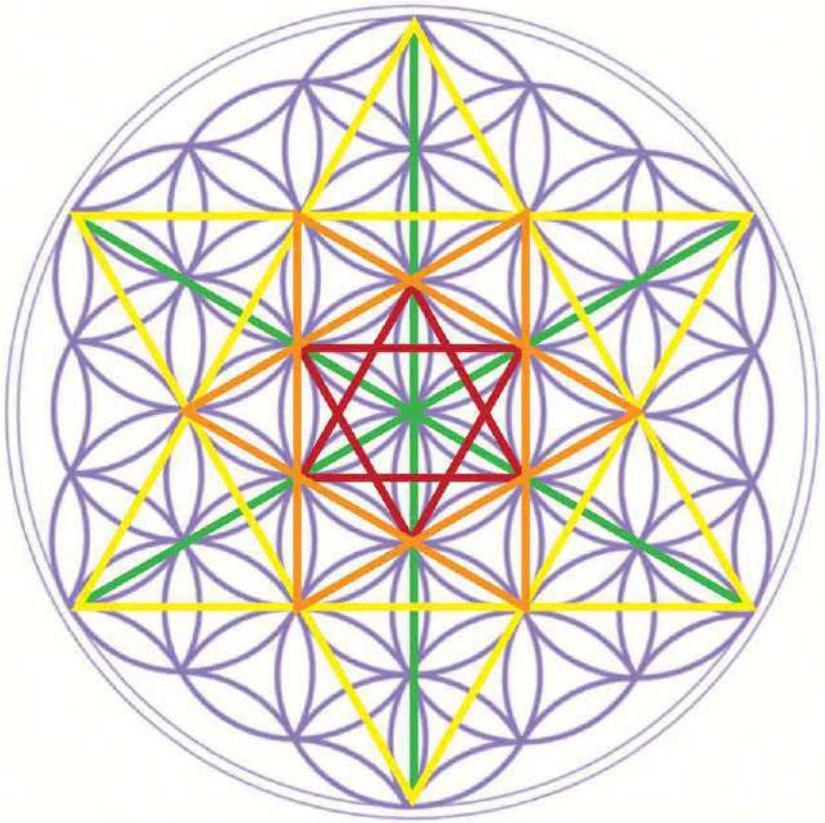


space-time

star tetrahedron



Flower of Life



The Flower of Life is a name for a geometrical figure composed of multiple evenly-spaced, overlapping circles.

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Unit circles - SINE WAVES - Photons

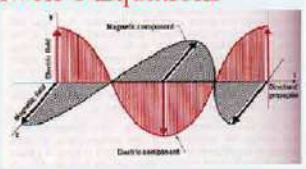
Maxwell's Equations

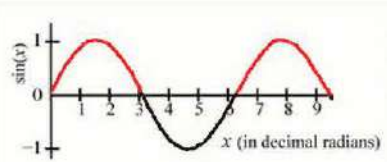
$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$

$\nabla \cdot \vec{D} = \rho$

$\nabla \times \vec{H} = \frac{\partial \vec{D}}{\partial t} + \vec{J}$

$\nabla \cdot \vec{B} = 0$





electric fields

Classic model of a photon

$e^{i\tau/4}$ $e^{i\tau/3}$ $e^{i\tau/6}$ $e^{i\tau/8}$ $e^{i\tau/12}$ $e^{i\tau/2}$ $e^{i\cdot 0}, e^{i\tau}$ $e^{i\cdot(3\tau/4)}$

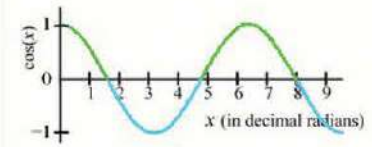
$e^{i\pi} = -1$

$i \equiv \sqrt{-1}$

N S N S

v

magnetic fields



Tetryonic model of a photon

Magnetic waveforms are 90 degrees out of phase with Electric waveforms

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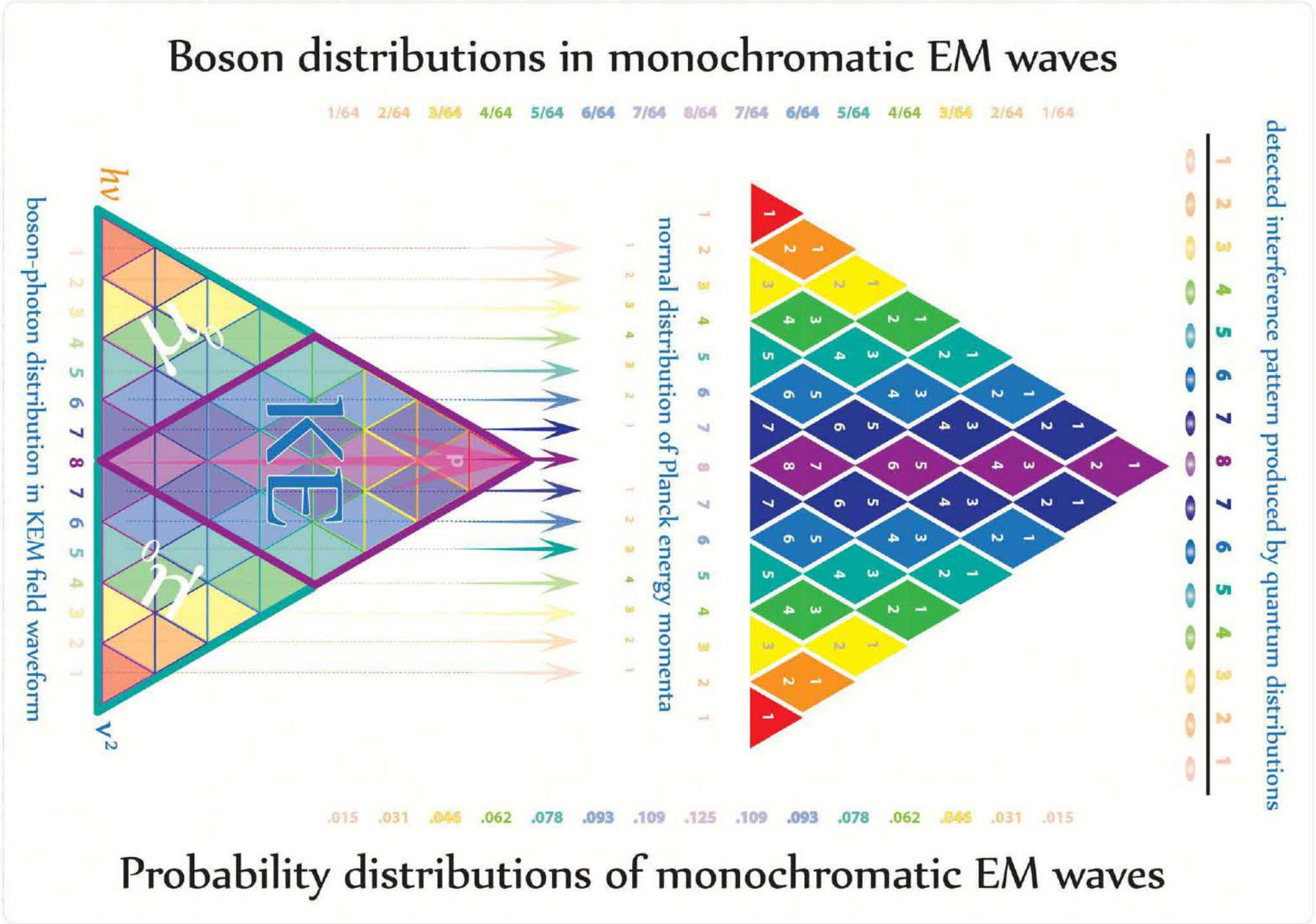
Boson distributions in monochromatic EM waves
1/64 2/64 3/64 4/64 5/64 6/64 7/64 8/64 7/64 6/64 5/64 4/64 3/64 2/64 1/64
detected interference pattern produced by quantum distributions
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
normal distribution of Planck energy momenta
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
boson-photon distribution in KEM field waveform
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
hν
KE
p
v²
.015 .031 .046 .062 .078 .093 .109 .125 .109 .093 .078 .062 .046 .031 .015
Probability distributions of monochromatic EM waves

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Wave interference patterns

The double-slit experiment, sometimes called Young's experiment, is a demonstration that matter and energy can display characteristics of both waves and particles, and demonstrates the fundamentally probabilistic nature of quantum mechanical phenomena and Establishes the quantum interference principle known as wave–particle duality.

Matter particles are stopped by the barrier but the [K]EM wave passes through both slits and is diffracted by them producing weaker EM waves that then superposition with each other to produce interference patterns

It is not the Particle passing through both slits that produces an interference pattern it is the particle's associated K[EM] wave

Equilateral superpositioned KEM waves produce constructive and destructive interference waves that have historically been interpreted as being circular wavefronts

photo-electron KEM wave photon intensities

The Compton frequency of any [K]EM wave is comprised of identical wavelength Photons which can combine to produce interference patterns

electrons will be stopped by the material barrier but their associated KEM field energy momenta will be absorbed by the screen and 'tunnel through' the barrier to contribute to the interference pattern

final interference pattern produced will depend on phase relationships of the two super-positioned wavefronts

Any detctor placed after the primary screen will remove energy from the secondaryKEM fields and affect the interference patterns produced

In the basic version of the experiment, a coherent light source such as a laser beam illuminates a thin plate pierced by two parallel slits, and the light passing through the slits is observed on a screen behind the plate. The wave nature of light causes the light waves passing through the two slits to interfere, producing bright and dark bands on the screen — a result that would not be expected if light consisted strictly of particles. However, on the screen, the light is always found to be absorbed as though it were composed of discrete particles or photons.

If one slit is observed for the passage of the electron in order to determine its physical state then the its KEM field wave will be absorbed by the detector resulting in only one wave remaining, enforcing a classical particle outcome

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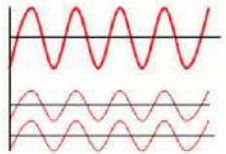
Quantum computing via EM wave super-positioning

BY superpositioning two beams
of EM radiation the resultant 'colours'
will perform quantum level computations
that can be read via the resultant
interference patterns produced

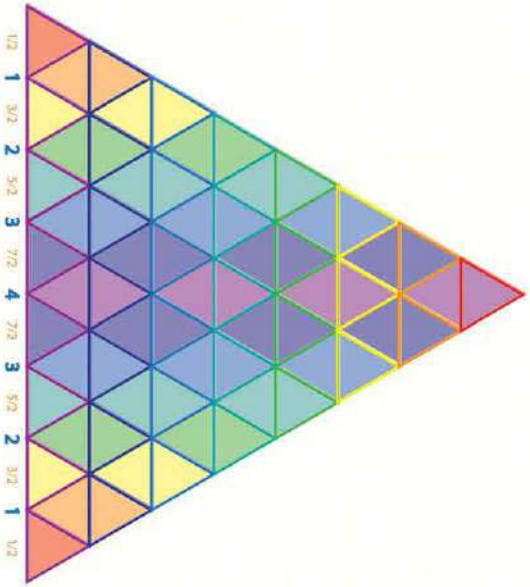


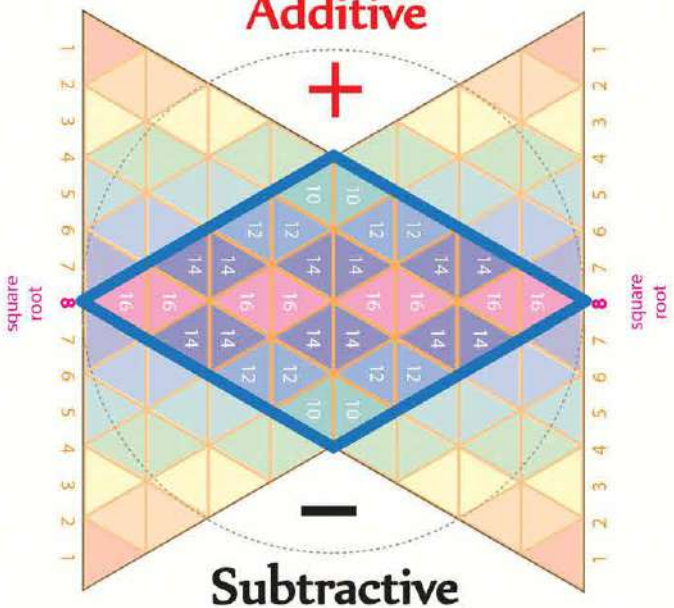
constructive interference

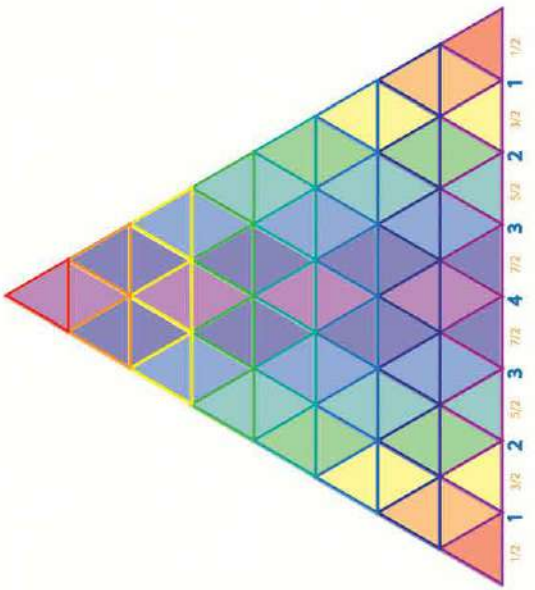
additive in-phase EM waves

In phase

Additive

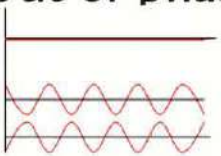






Subtractive

Out of phase



destructive interference

subtractive out-of-phase EM waves

Various basic operations, such as
ADDITION, SUBTRACTION and
SQUARE ROOTS etc
are all easily computed using
EM wave super-positioning

The lines of Force

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By utilising the statiscal distribution of equilateral Planck energy momenta quanta in EM waves
Tetryonic theory provides a practical geometric solution to quantum computing problems

P vs. NP

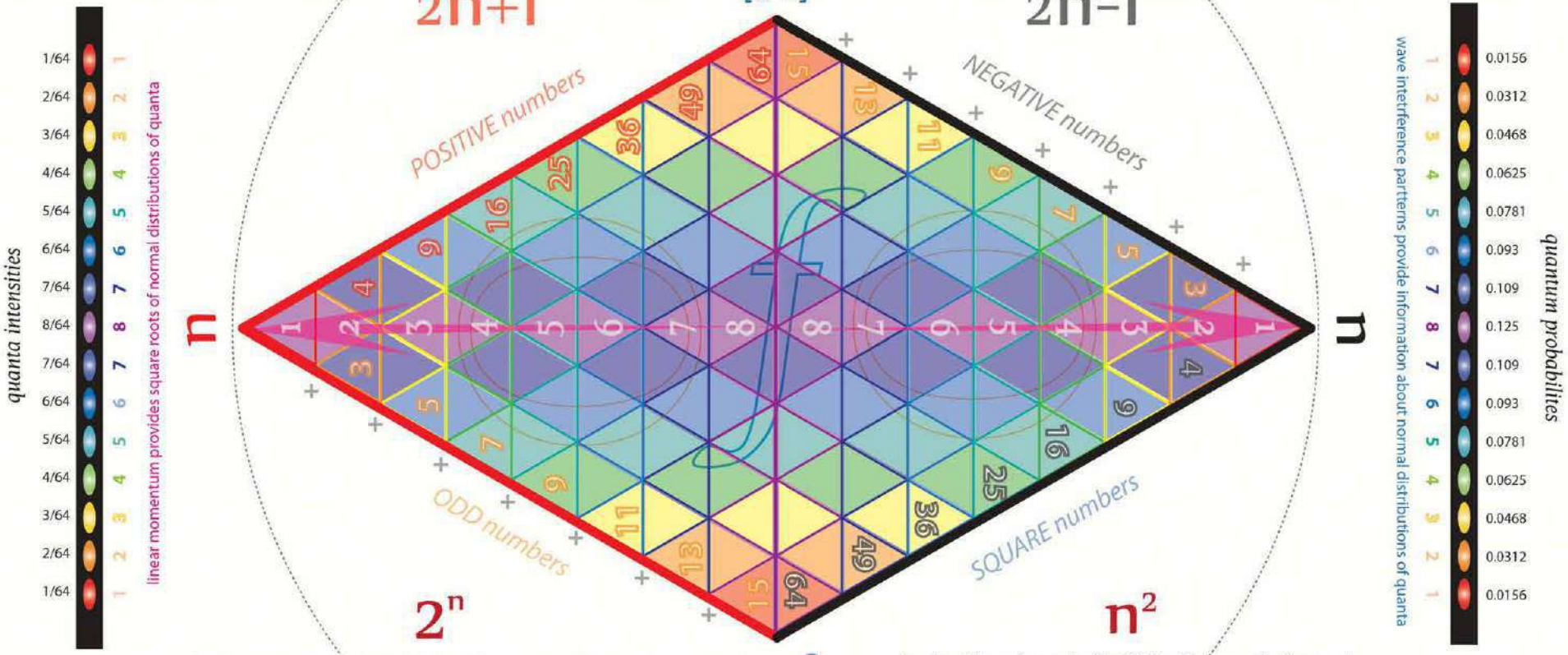
The set of all decision problems for which an algorithm exists which can be carried out by a deterministic Turing machine in polynomial time

the set of all decision problems for which an algorithm exists which can be carried out by a non-deterministic Turing machine in polynomial time

An algorithm of time complexity ***O(n)*** is one which increases in time linearly as the "size of the problem" (whatever n stands for) increases.

q
bosons

E
photons



An algorithm of complexity ***O(2ⁿ)*** utlises exponential quanta; increasing n by 1 will double the quanta required

An algorithm of complexity ***O(n²)*** utilises quadratic quanta, meaning that if you double n it will use four times as many quanta.

Unlike Math treatise on P vs Np that require exponential polynomial time ***O(nᵏ)*** Tetryonic geometry of EM fields utilise exponential energies per second

1 second

2hv

hf

By relating p to the number of equilateral wave fields in any EM wave very large [pn²] data sets can be modelled and processed every second

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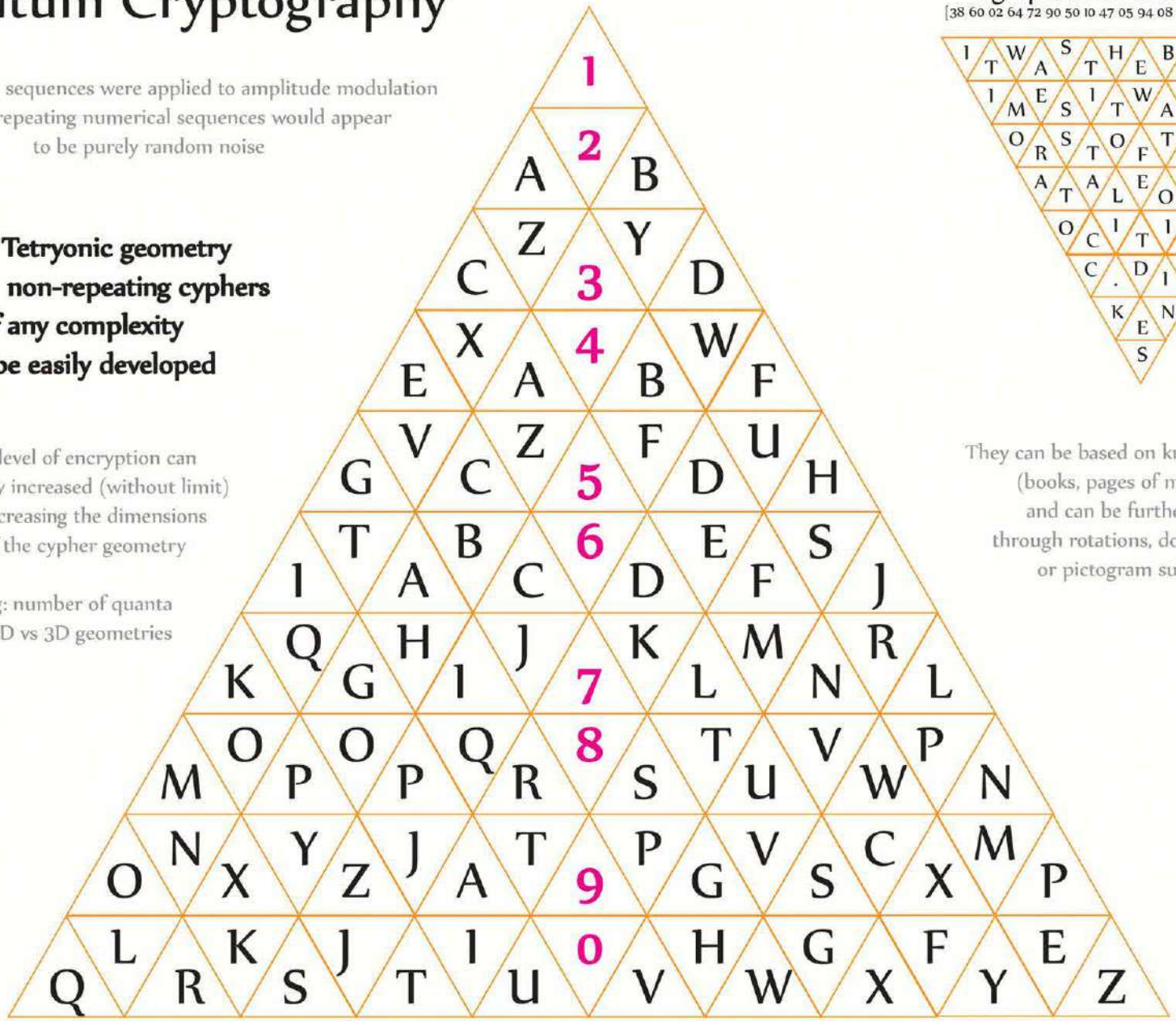
Quantum Cryptography

If the numerical sequences were applied to amplitude modulation their non-repeating numerical sequences would appear to be purely random noise

Using Tetryonic geometry advanced non-repeating cyphers of any complexity can be easily developed

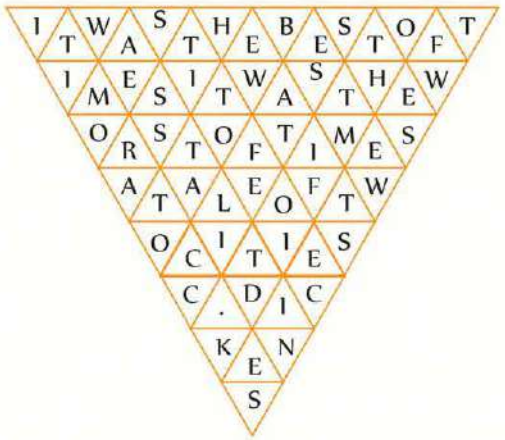
The level of encryption can be easily increased (without limit) by increasing the dimensions of the cypher geometry

eg: number of quanta 2D vs 3D geometries


1
2
A B
Z Y
C 3 D
X 4 W
E A B F
V Z F U
G C 5 D H
T B 6 E S
I A C D F J
Q H J K M R
K G I 7 L N L
O O Q 8 T V P
M P P R S U W N
N Y J T P V C M
O X Z A 9 G S X P
L K J I 0 H G F E
Q R S T U V W X Y Z

eg: quantum encryption 1024

[38 60 02 64 72 90 50 10 47 05 94 08 48 52 27 26 51 66 01 91 03 20]



They can be based on known letter sources (books, pages of magazines etc) and can be further encrypted through rotations, double encrypting or pictogram substitutions

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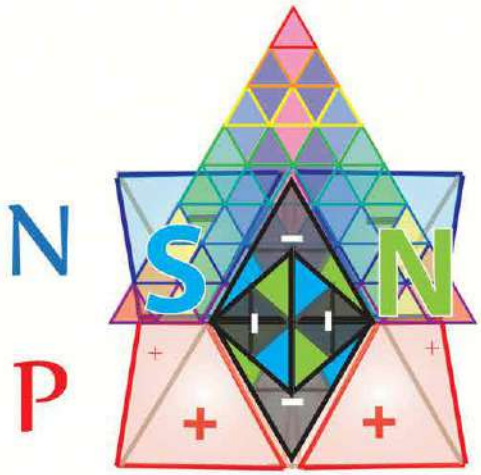
Quantum Computing

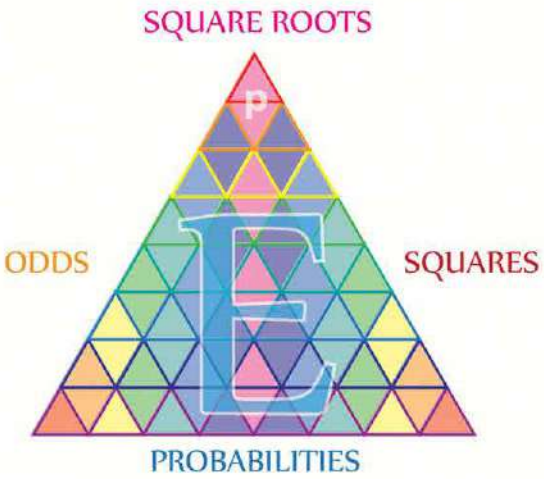
The Proton/Neutron geometries of atomic nuclei can be built at the quantum scale
to create an atomic nuclei that can operate as a Opto-memory-transistive computing element,
many elements can then be combined in lattices to create super computers no larger than bacterium

Spin UP

Energy can be gated through individual nuclei
using the centre Baryon as the base transistor element,
in turn effecting the energies of bound photo-electrons

Spin DOWN





Q-bits

photo-electronic transitions can be used to directly recieve
or emit memory states through the absorption and emission
of spectral photons of specific energy momenta

1

0

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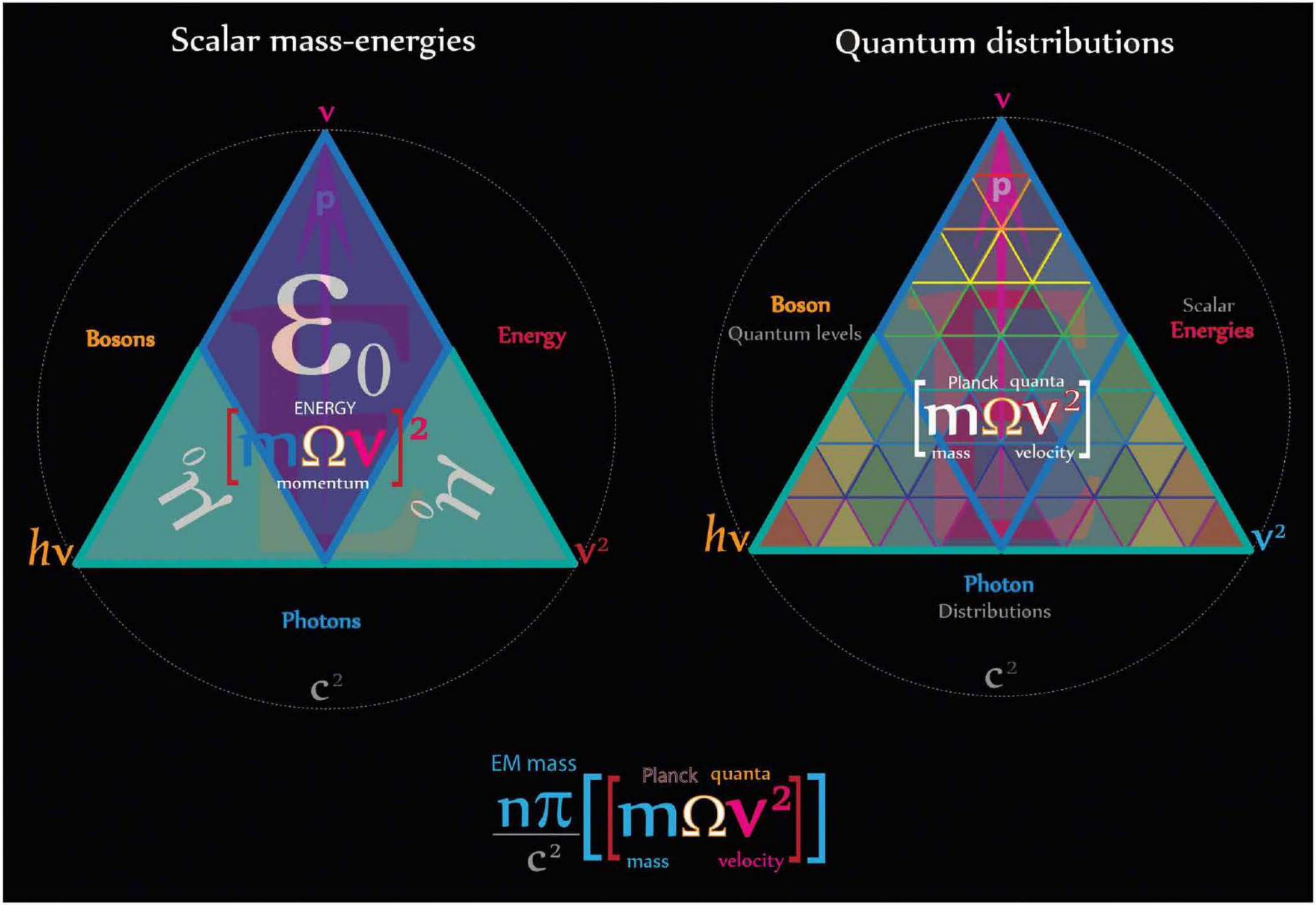

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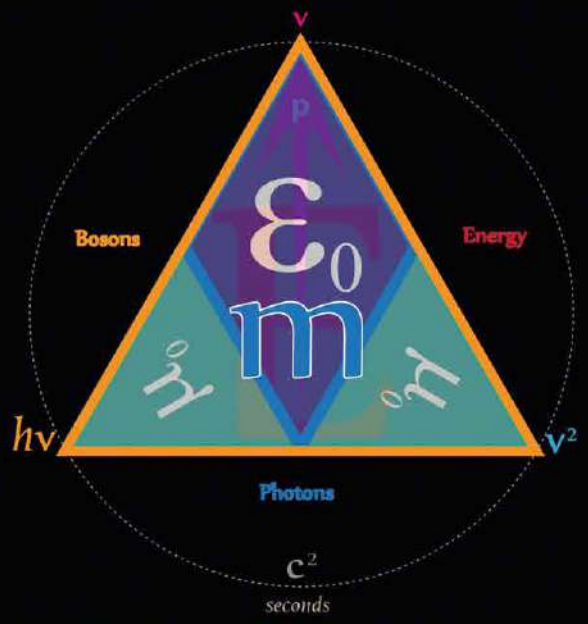
2D mass

EM mass

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta: mass, velocity



Measure of planar energies
in a nπ radiant wave
geometry
[per second]

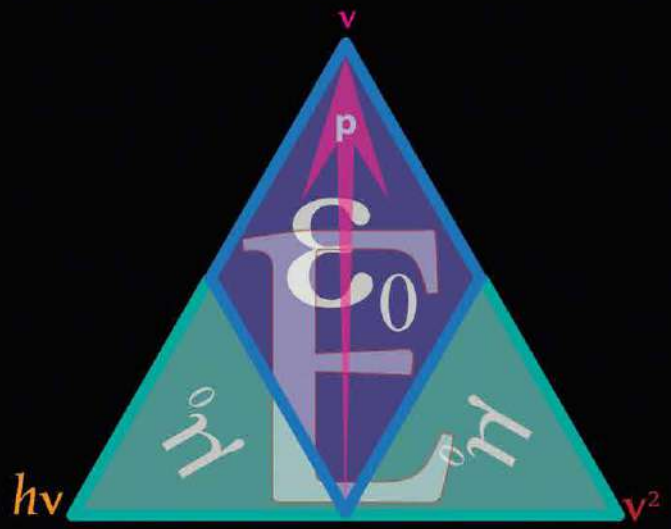
mass quantum
7.376238634 e-51 kg

ENERGY

$$n\pi\left[\left[m\Omega v^2\right]\right]$$

ENERGY: momenta

Equilateral energy momenta
has a mass equivalence
per unit of Time



c² is the radial geometry
created by radiant energy
in 1 second

Planck Constant
6.629432672 e-34 J.s

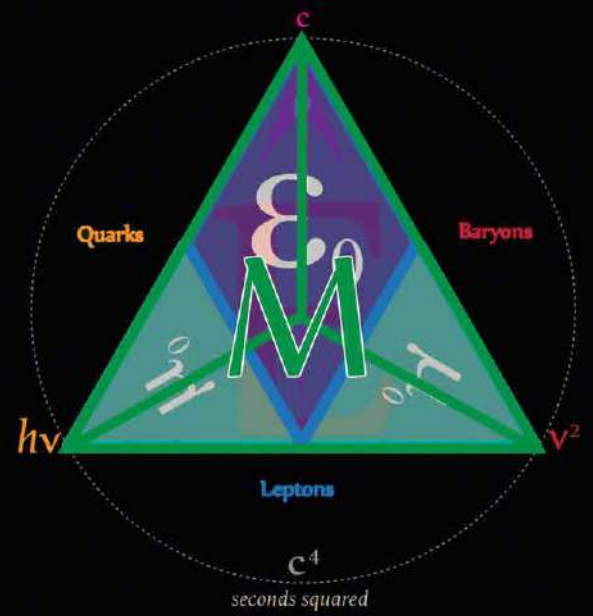
3D Matter

Matter

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta: mass, velocity

Measure of mass-energy
in a 4nπ standing wave
topology
[per second squared]



Matter quantum
2.9504955454 e-50 kg

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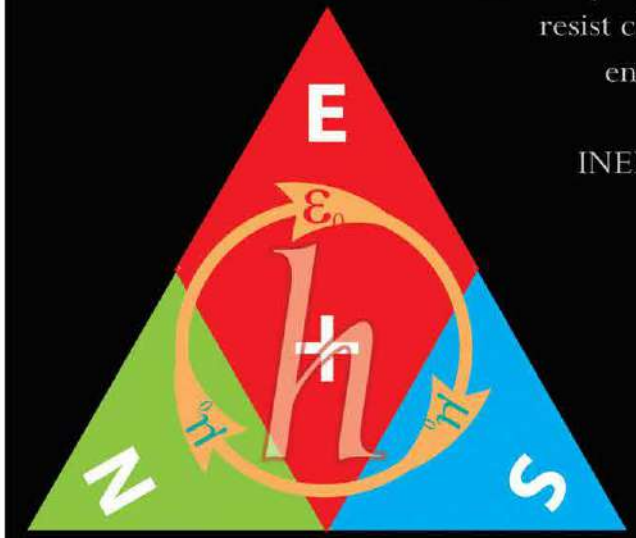
Planck's constant – the quantum of Action

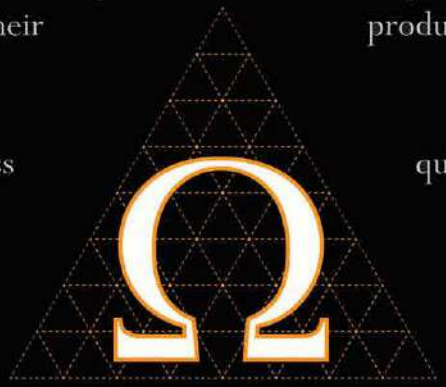
all ideal quantum inductive loops resist changes to their energy levels

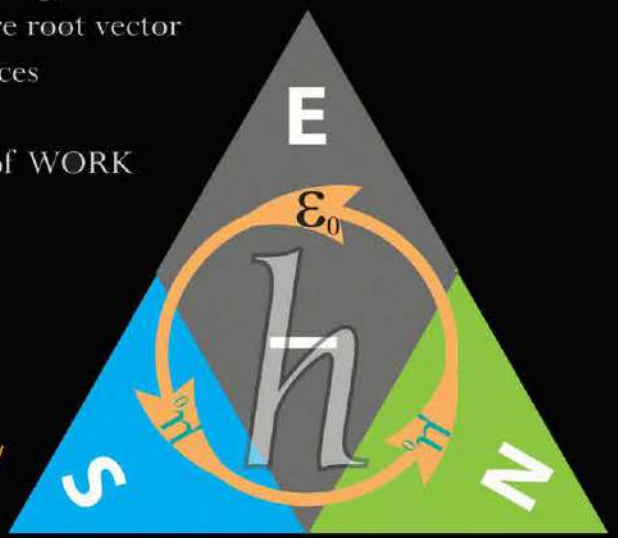
INERTIAL mass

all equilateral energy momenta produce square root vector Forces

quantum of WORK





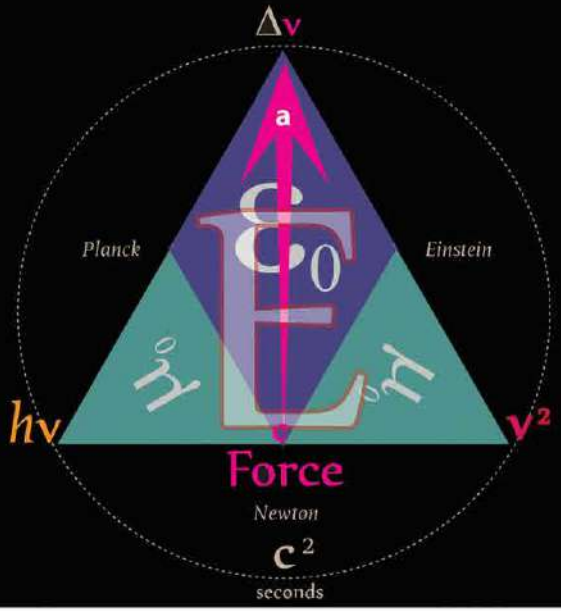


Quantised angular momentum is equilateral geometry

The two sides of Planck's Constant

The square root of all Energy is linear momentum

Equilateral energy quanta per second



Quantised angular momenta per second

mass

time

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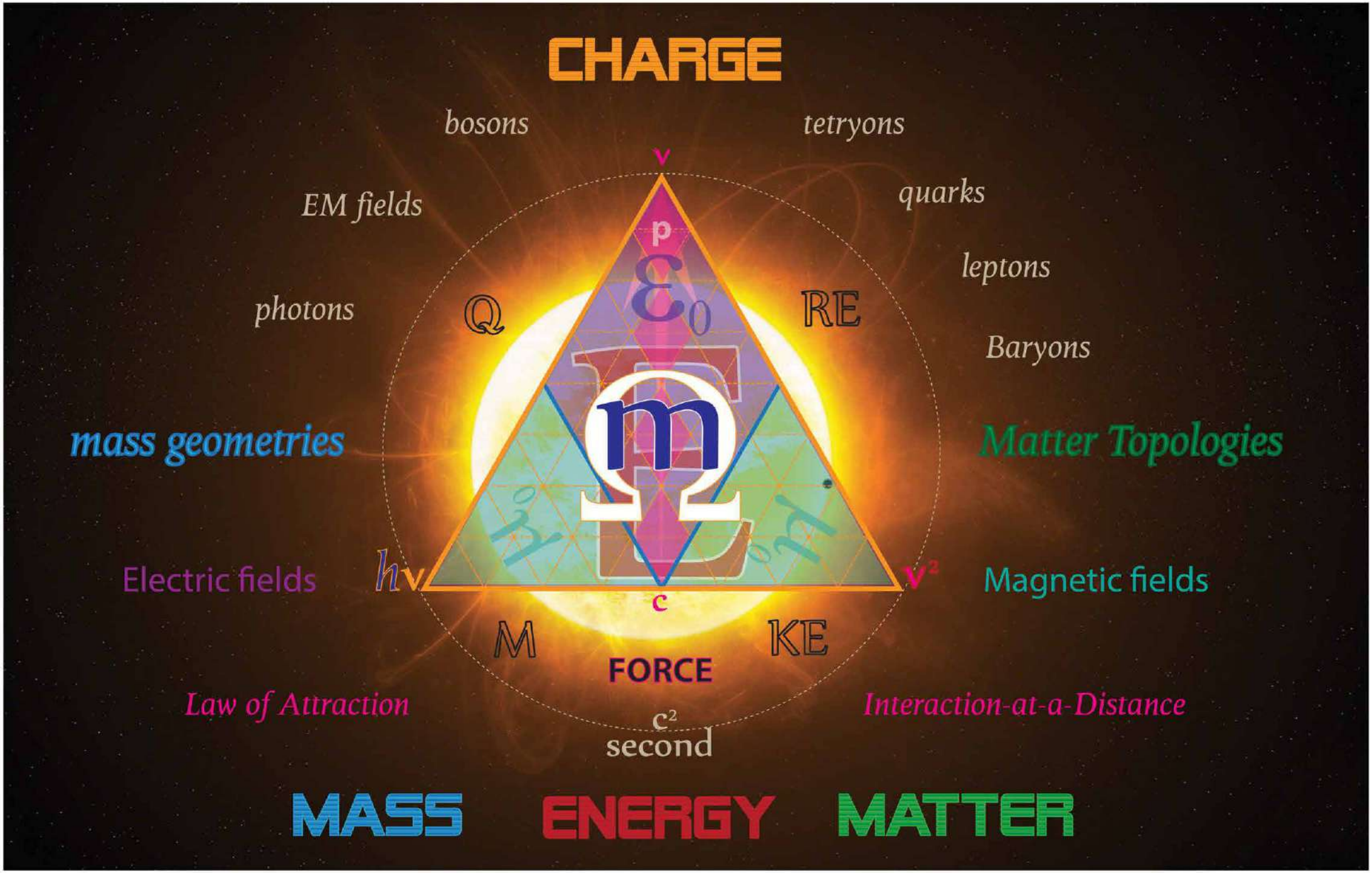

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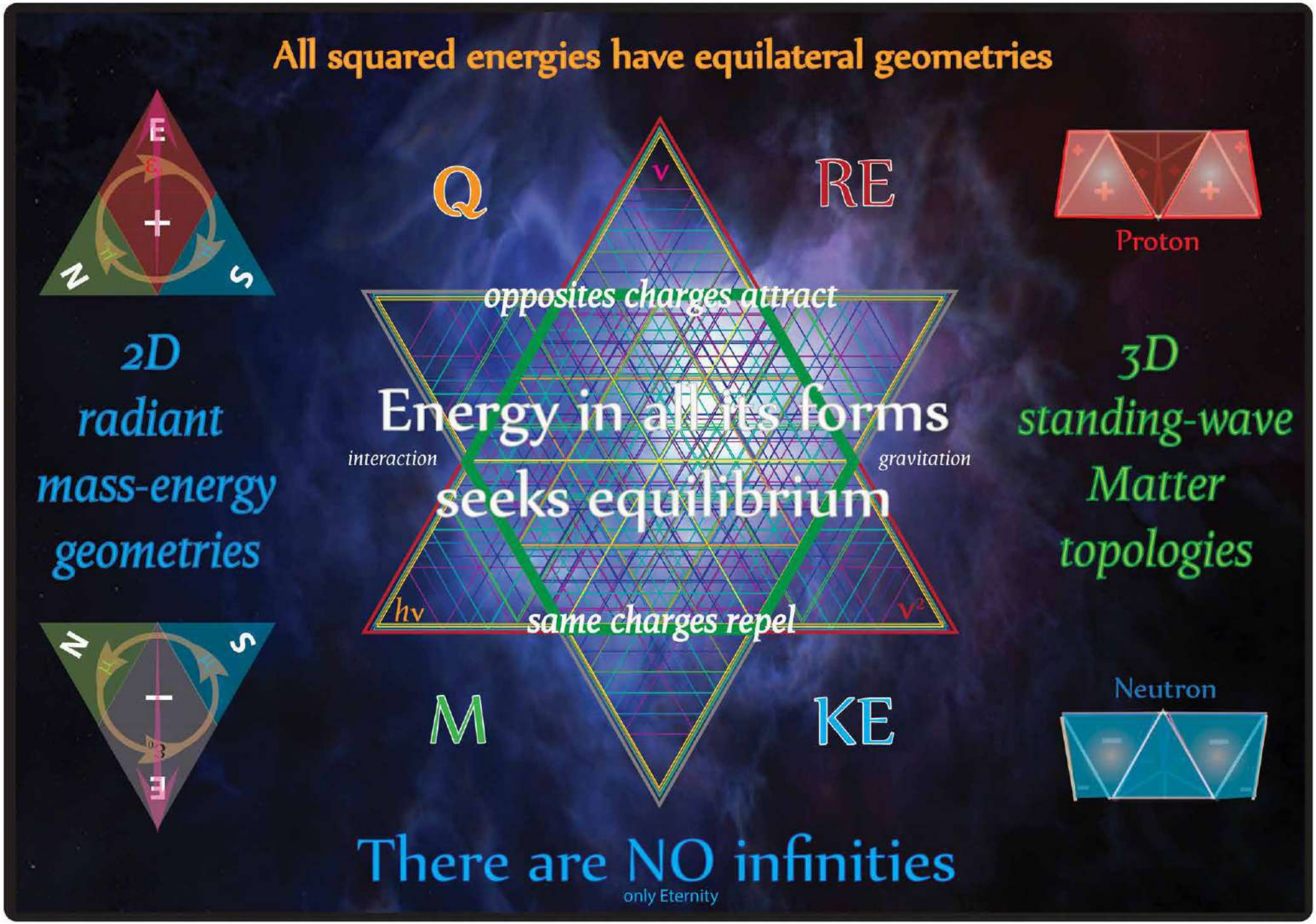

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Clean, limitless Energy

Unlimited resources

The geometric field equation of mass-ENERGY-Matter

$$T\pi \left[\left[\varepsilon_0 \mu_0 \right] . \left[m \Omega v^2 \right] \right]$$

Matter (topology) · spatial (impedance) · Planck quanta · mass · velocity

Unifying Science and Religion

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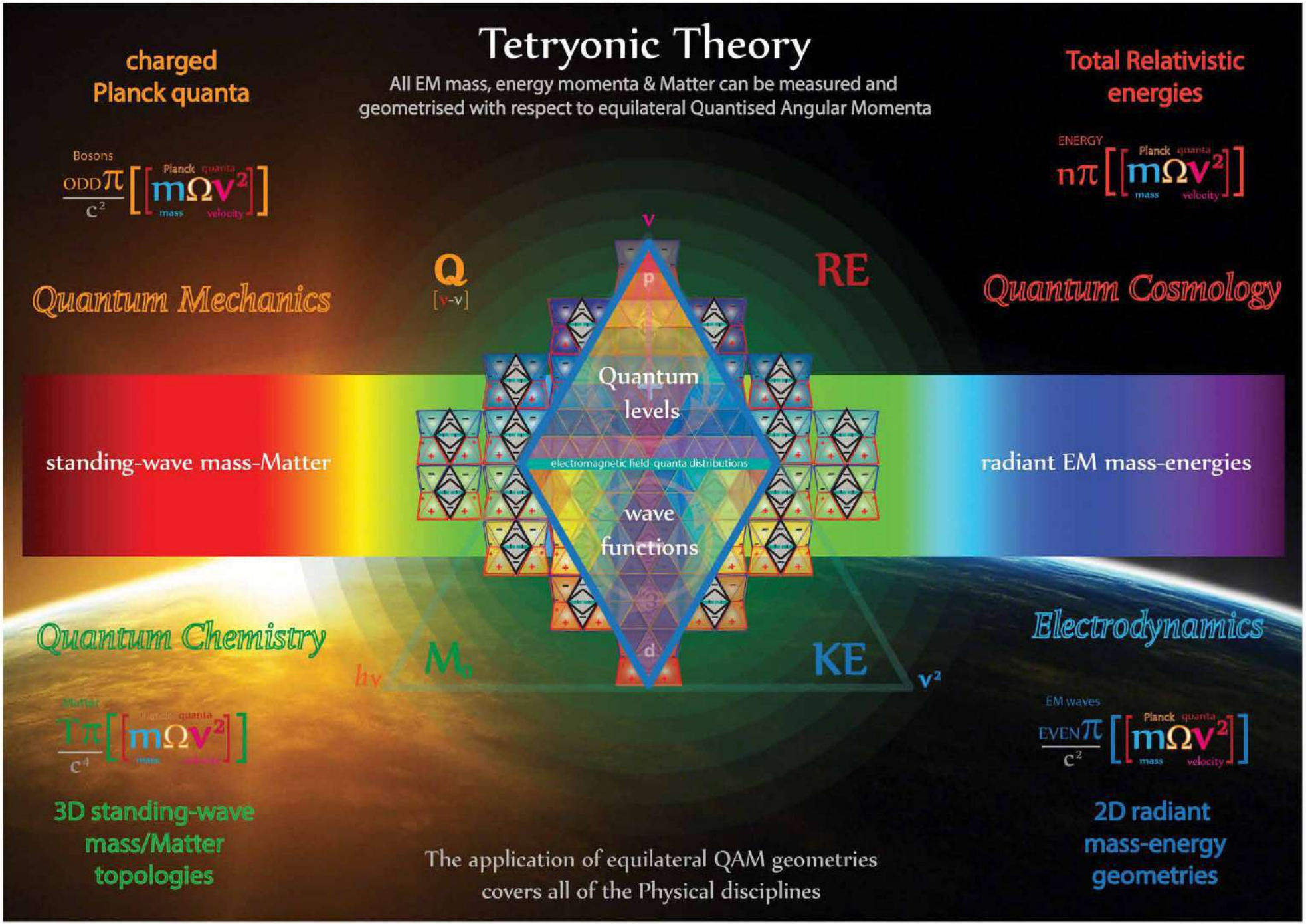

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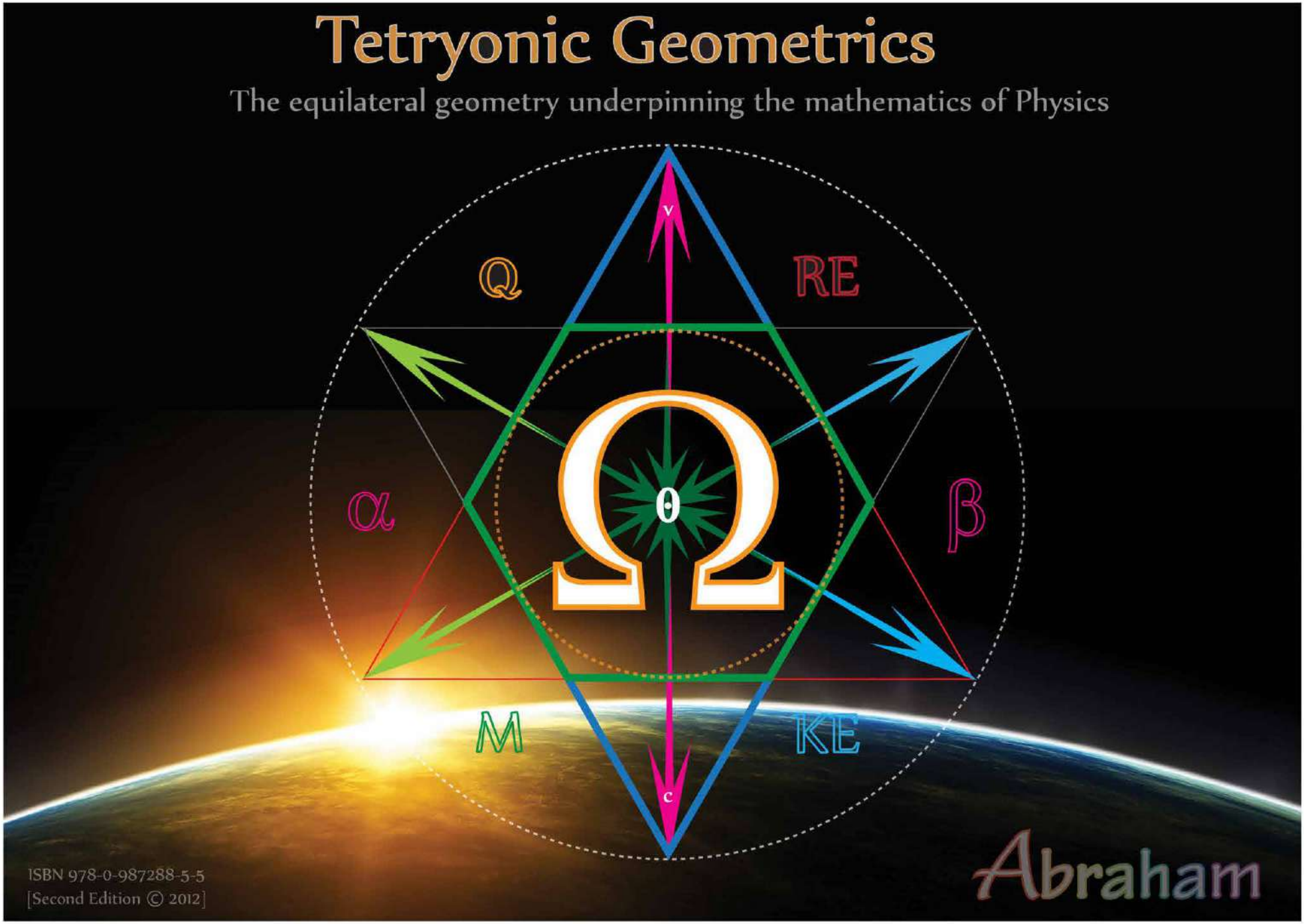

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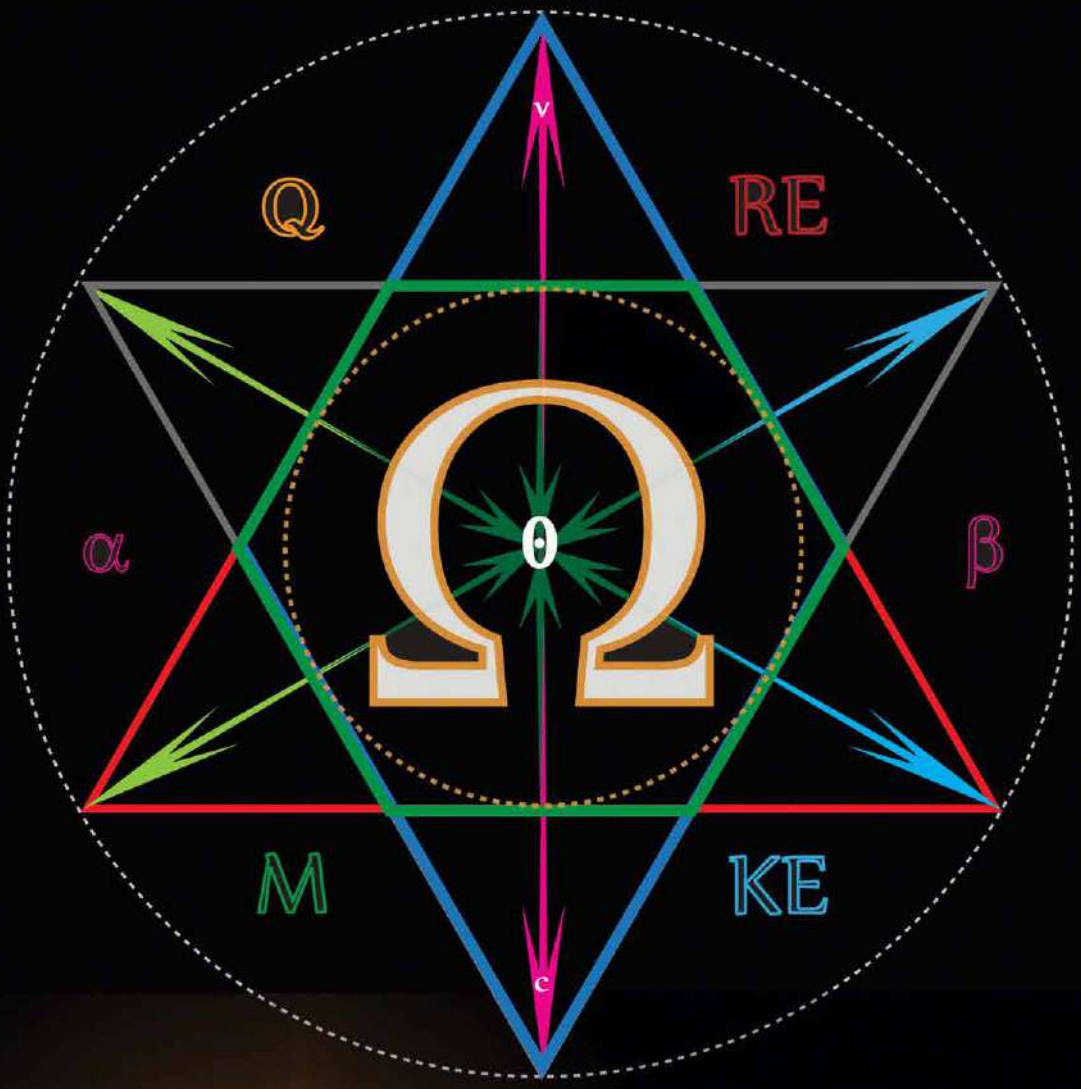
TETRYONICS

The equilateral geometry underpinning the mathematics of Physics



Foundational physics Mathematics

Abraham

ISBN 978-0-987288-5-5

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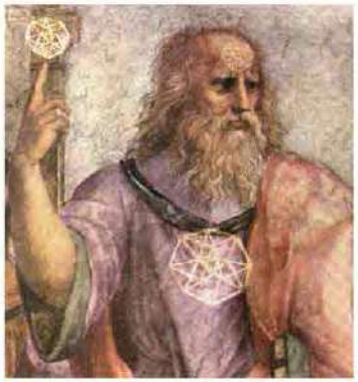
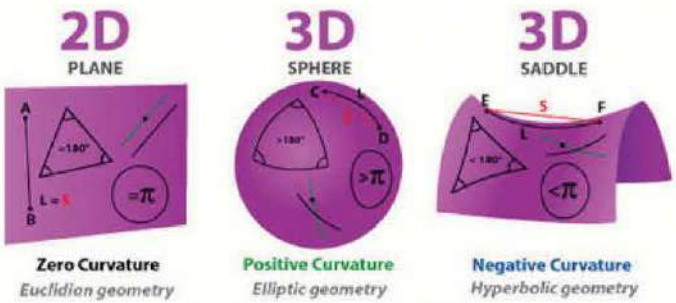
Geometry and the Theory of Everything

Plato



(c.428-348 BC)

DIFFERENT TYPE OF GEOMETRIES



(studied by Omar Khayyam, Girolamo Saccheri, Bernhard Riemann, ...)

Euclid

(c.330-275 BC, fl. c.300 BC)

The Socratic tradition was not particularly congenial to mathematics, as may be gathered from Socrates' inability to convince himself that 1 plus 1 equals 2, but it seems that his student Plato gained an appreciation for mathematics after a series of conversations with his friend Archytas in 388 BC.

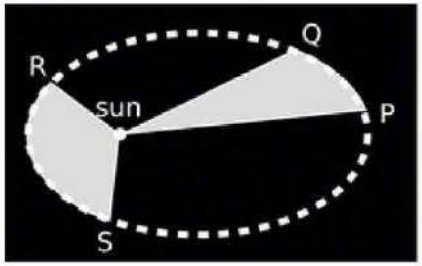
One of the things that most caught Plato's imagination was the existence and uniqueness of what are now called the five "Platonic solids".

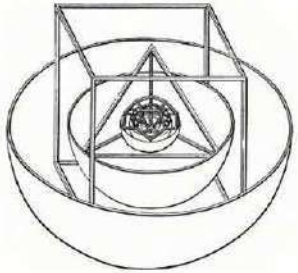
It's uncertain who first described all five of these shapes - it may have been the early Pythagoreans - but some sources (including Euclid) indicate that Theaetetus (another friend of Plato's) wrote the first complete account of the five regular solids.

Presumably this formed the basis of the constructions of the Platonic solids that constitute the concluding Book XIII of Euclid's Elements.

In any case, Plato was mightily impressed by these five definite shapes that constitute the only perfectly symmetrical arrangements of a set of (non-planar) points in space, and late in life he expounded a complete "theory of everything", in the treatise called Timaeus, based explicitly on these five solids.

Interestingly, almost 2000 years later, Johannes Kepler was similarly fascinated by these five shapes, and developed his own cosmology from them





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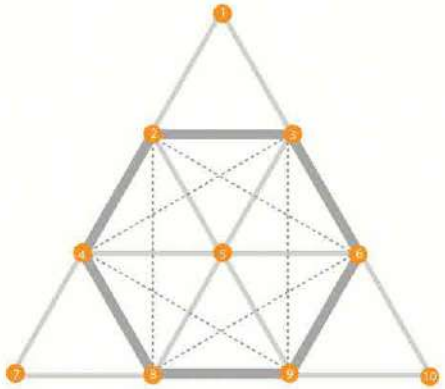
Tetractys

The Greek Tetractys is a triangular figure consisting of ten points arranged in four rows:

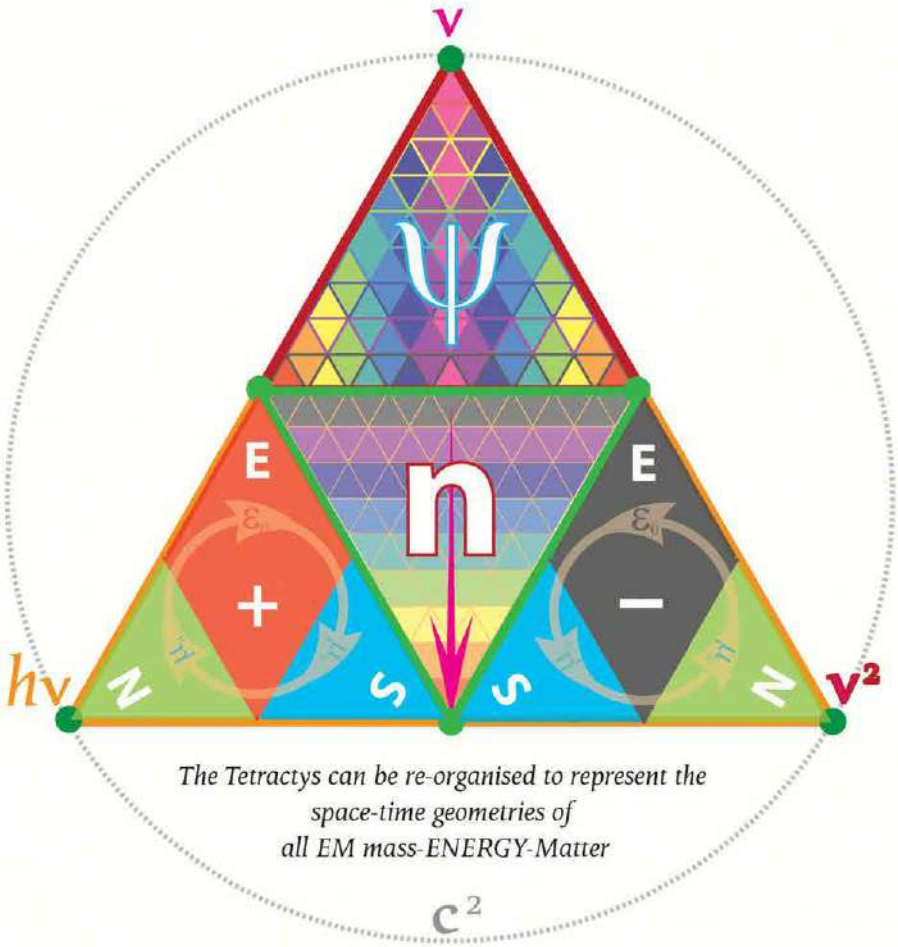
one, two, three, and four points in each row, which is the geometrical representation of the fourth triangular number.

As a mystical symbol, it was very important to the secret worship of the Pythagoreans.



Sacred numbers

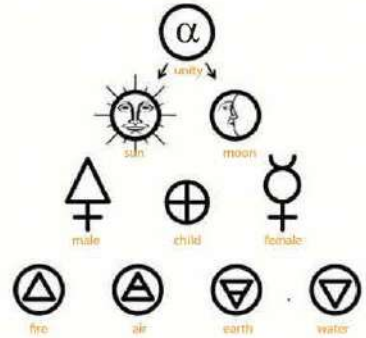
The Tetractys historically symbolized the four elements [Earth, Air, Fire, and Water] and the relationship between Humanity and the cosmos created by GOD



The Tetractys can be re-organised to represent the space-time geometries of all EM mass-ENERGY-Matter

The tetrad was the name given to the number four - in Pythagorean philosophy there were four seasons and four elements, and the number was also associated with planetary motions and music

As a mystical symbol, it was very important to the secret worship of the Pythagoreans.



The Cosmos

The single triangle in the first row represents zero-dimensions (a point)
A vector direction in one-dimension can be represented as a line between any two points
The second row represents a Boson (two-dimensions in a plane defined by a rhombus of three triangles)
The whole figure folded represents three-dimensions (a tetrahedron defined by four apex points)
Photons of ElectroMagnetic mass-Energy quanta are represented by two opposing triangles

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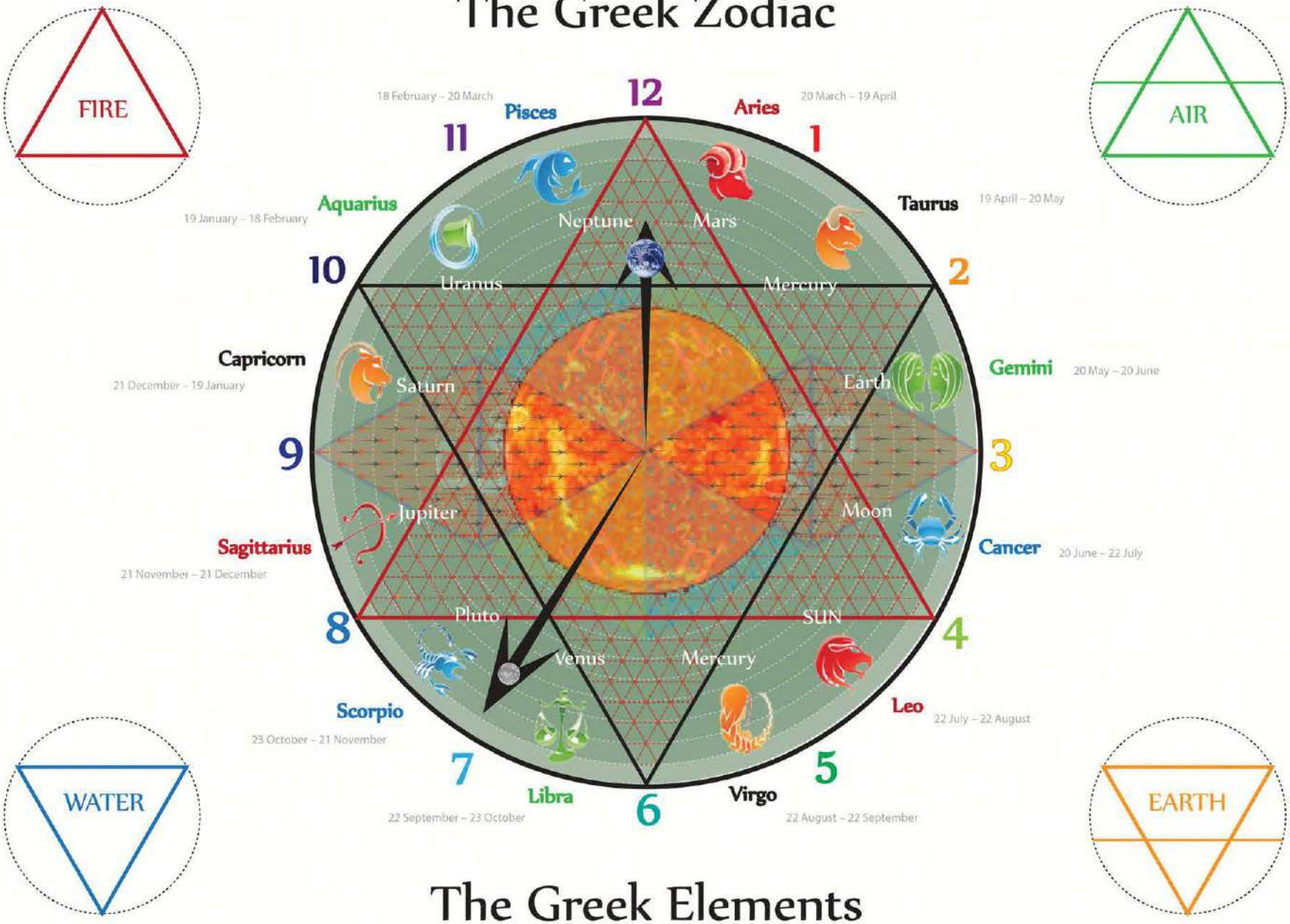
The Greek Zodiac



The Greek Elements

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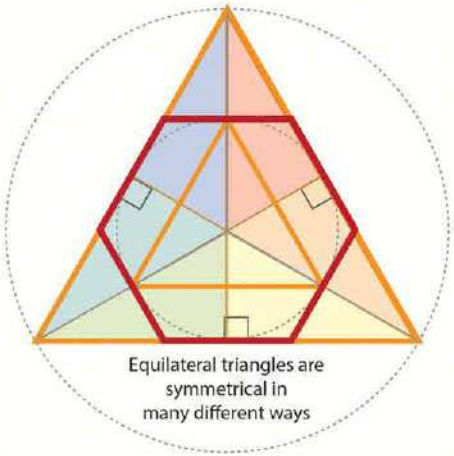
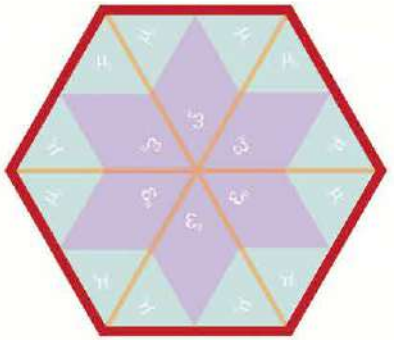
Equilateral Triangles

An equilateral triangle is a triangle in which all three sides are equal



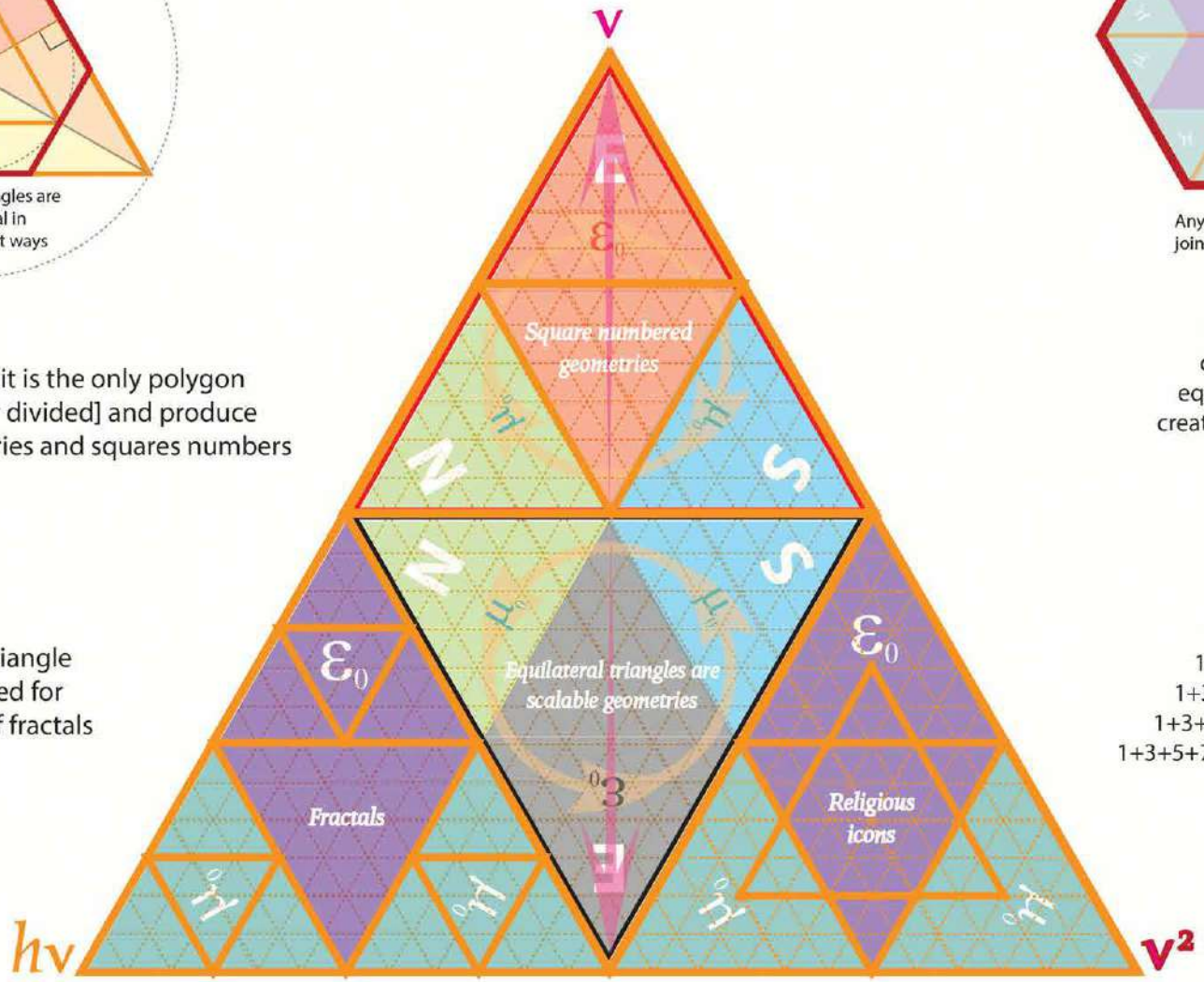
Equilateral triangles are symmetrical in many different ways



Any six equilateral triangles joined can make a hexagon.

It is unique in that it is the only polygon that can be tiled [or divided] and produce only identical geometries and squares numbers

The equilateral triangle is eminently suited for the construction of fractals



The tesselation of odd numbered equilateral triangles creates square numbers

That is,

1
1+3 = 4
1+3+5 = 9
1+3+5+7 = 16
1+3+5+7+9 = 25
1+3+5+7+9+11 = 36
1+3+5+7+9+11+13 = 49
1+3+5+7+7+9+11+13+15 = 64
etc

An equilateral triangle is simply a specific case of a regular polygon with 3 sides

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The Pythagorean Theorem

Though attributed to Pythagoras, it is not certain that he was the first person to prove it.

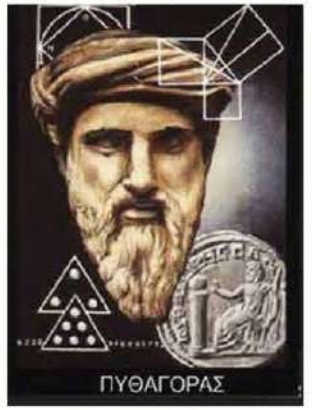
The first clear proof came from Euclid, and it is possible the concept was known 1000 years before Pythoragas by the Babylonians

$$a^2 + b^2 = c^2$$

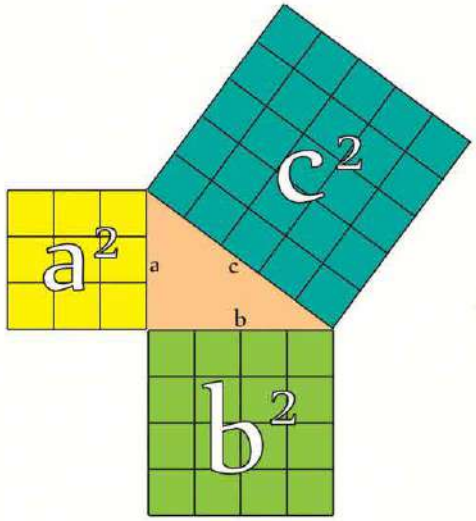
The square of the hypotenuse of a triangle is equal to the sum of the squares of its sides.

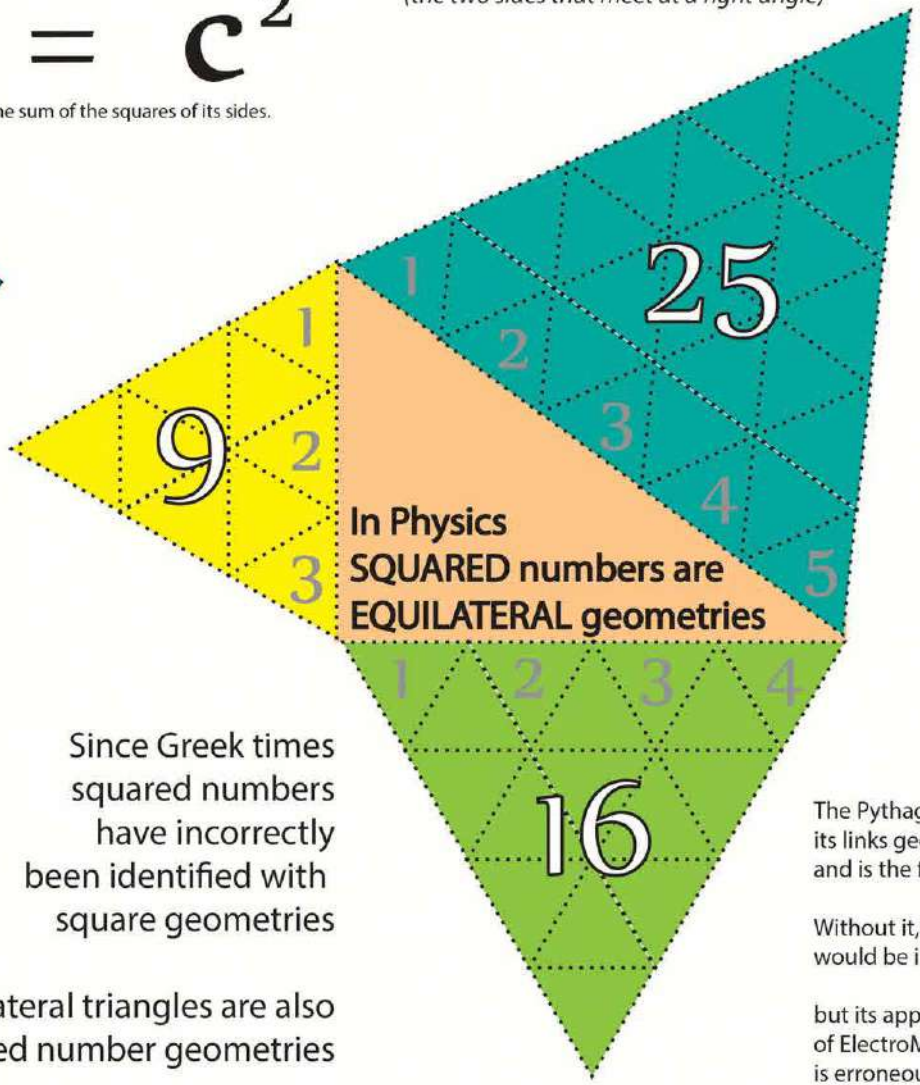
In any right triangle,
the area of the square whose side is the hypotenuse
(the side opposite the right angle) is equal to
the sum of the areas of the squares
whose sides are the two legs
(the two sides that meet at a right angle)

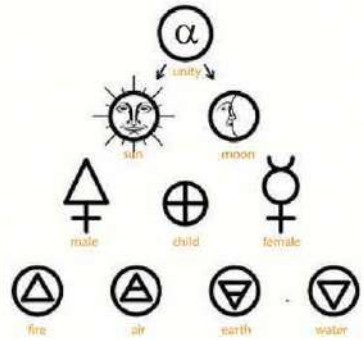
Pythagoras of Samos



about (570 – 495 BC)







Pythagorean Tetractys

Since Greek times
squared numbers
have incorrectly
been identified with
square geometries

Equilateral triangles are also
squared number geometries

The Pythagorean equation is at the core of much of geometry,
its links geometry with algebra,
and is the foundation of trigonometry.

Without it, accurate surveying, mapmaking, and navigation
would be impossible,

but its application to the energy-momenta geometries
of ElectroMagnetic fields and Matter in motion in Physics
is erroneous and must be corrected for science to advance

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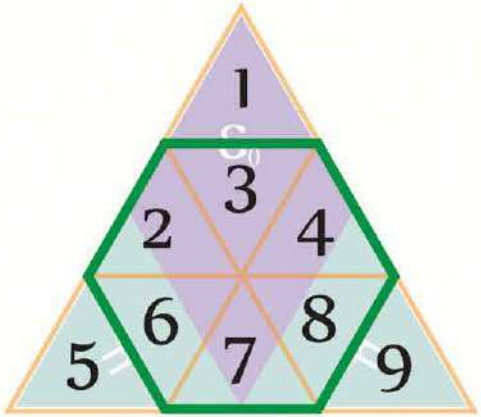
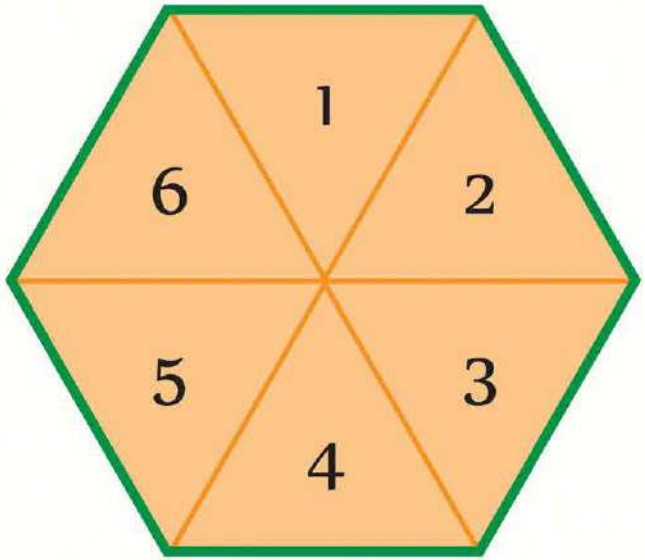
Hexagons



Energy geometries

A regular hexagon can be subdivided into six equilateral triangles

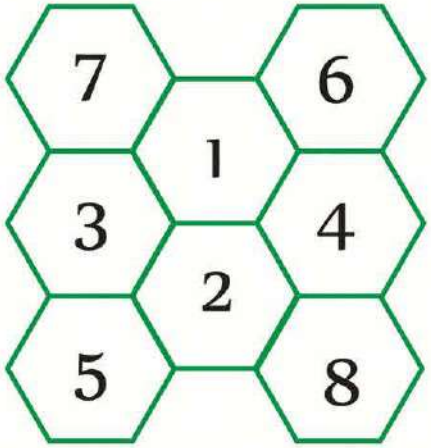
Hexagons are the only regular polygon that can be subdivided into another regular polygon



Hexagons are the unique regular polygon such that the distance between the center and each vertex is equal to the length of each side

An interesting relationship between circular and hexagonal geometry is that hexagonal patterns often appear spontaneously when natural forces are trying to approximate circles

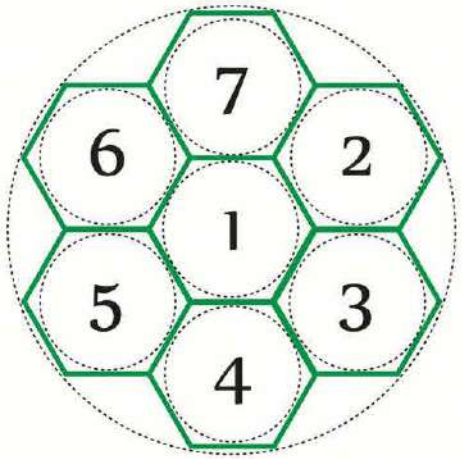
Atomic nuclei geometries



Hexagons can be tiled or tessellated in a regular pattern on a flat two-dimensional plane

Six is a highly composite number, the second-smallest composite number, and the first perfect number.

That is, 1*2*3=1+2+3=6



Hexagonal tessellation is topologically identical to the close packing of circles on a plane

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Platonic Solids

The Pythagoreans knew that there were only five regular convex solids, the tetrahedon, cube, octahedron, icosohedron and dodecahedron and each one could be accurately circumscribed by a sphere.

FIRE

4 triangles meet to form a Tetrahedron

EARTH

6 squares meet to form a Cube

AIR

8 triangles meet to form a Octahedron

tetryons 4

regular deltahedrons

leptons 12

8 quarks

regular deltahedrons

20 Baryons

$$F - E + V = 2$$

faces edges vertexs

Plato

(c.428-348 BC)

The philosopher Plato concluded that they must be the fundamental building blocks – the atoms – of nature, and assigned to them what he believed to be the essential elements of the universe.

12 pentagons meet to form a Dodecahedron

THE HEAVENS

20 triangles meet to form a Icosahedron

WATER

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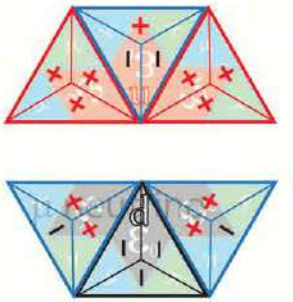
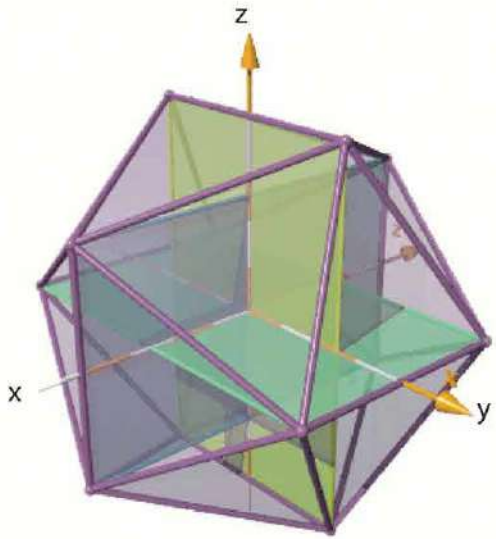
Tetryonic Solids

Despite their unique topologies Tetryonic solids are not unlike Platonic solids save that their toplogies are comprised entirely from complex hitherto undescribed **4nπ equilateral Planck mass-energy momenta geometries** that also match the Euler numbers of Platonic solids





mass geometries **4π** *tetryons* **4π** Matter topologies

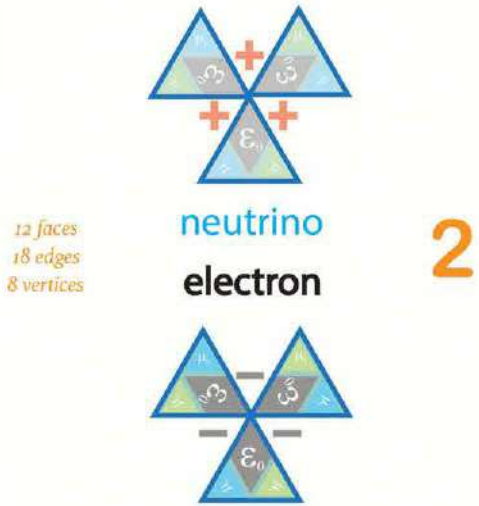
regular deltahedrons

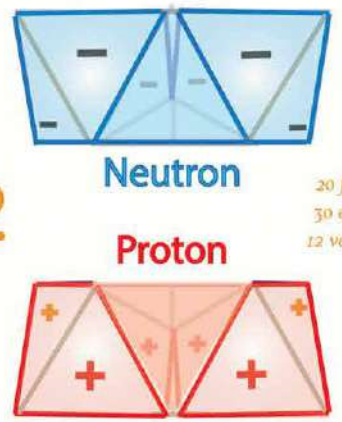
12π *leptons* **12π**

Matter topologies **8π** *quarks* **12π** mass geometries

regular deltahedrons

20π *Baryons* **36π**





Their equilateral topologies are best described as regular topologic-deltahedrons:

tetra-delta-hedrals	tetryons	4π external charge fascia
octa-delta-hedrals	quarks	8π external charge fascia
dodeca-delta-hedrals	leptons	12π external charge fascia
icoso-delta-hedrals	Baryons	20π external charge fascia

note:
Charged mass-energy fascia geometries and edges become "hidden" upon the meshing of delta-hedra to form Matter topologies

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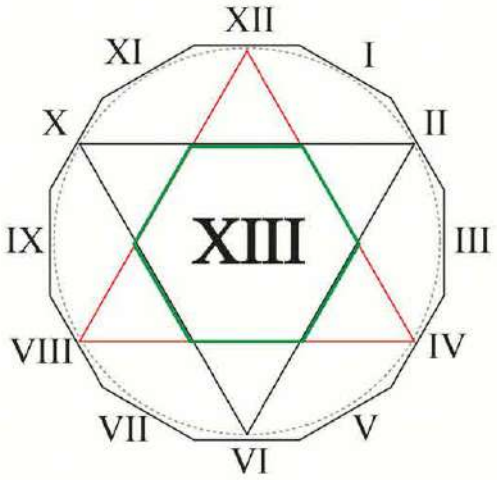
Euclidean geometry

Euclid

(c.330-275 BC, fl. c.300 BC)

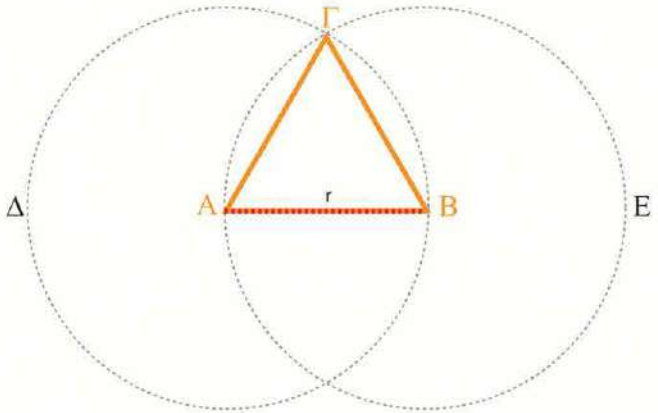
Arguably the most influential Mathematics book ever written is Euclid's 'The Elements'



In all, it contains 465 theorems and proofs, described in a clear, logical and elegant style, and using only a compass and a straight edge.

The Elements - Book 1 - Definition 20

Of the trilateral figures, an equilateral triangle is that which has its three EQUAL sides



Euclid's Elements - Book 1 - Proposition 1
Method of constructing an Equialteral triangle

Euclid's five general axioms were:

Things which are equal to the same thing are equal to each other.

If equals are added to equals, the wholes (sums) are equal.

If equals are subtracted from equals, the remainders (differences) are equal.

Things that coincide with one another are equal to one another.

The whole is greater than the part

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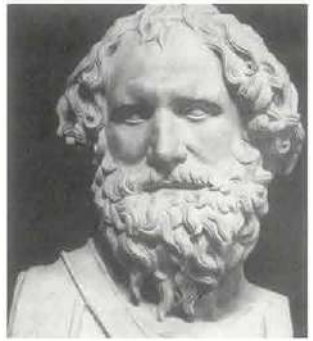
Archimedes



c. (287 BC – c. 212 BC)

As its definition relates to the circle,
π is found in many formulae in trigonometry and geometry,
especially those concerning circles, ellipses, or spheres.

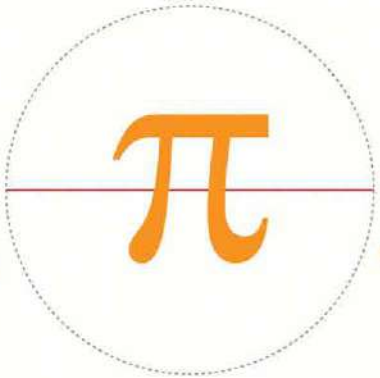
It is also found in formulae from other branches of science,
such as cosmology, number theory, statistics, fractals,
thermodynamics, mechanics, and electromagnetism

Incorrect identification of Pi [c/d] as opposed to Pi radians
in Physics has led to the inappropriate association
of spherical particles to the physical sciences
whereas equilateral triangles & tetrahedra
form its true geometry

The number π is a mathematical constant that is
the ratio of a circle's circumference to its diameter.

Pi

π is an irrational number
its decimal representation
never ends and never repeats.



$\pi = c/d$

The ratio C/d is constant,
regardless of the circle's size

3.141592654.....

Proof of the fact that C=2πr and how Archimedes proved it

Draw any circle.

Make a point anywhere on the circumference of the [green] circle.

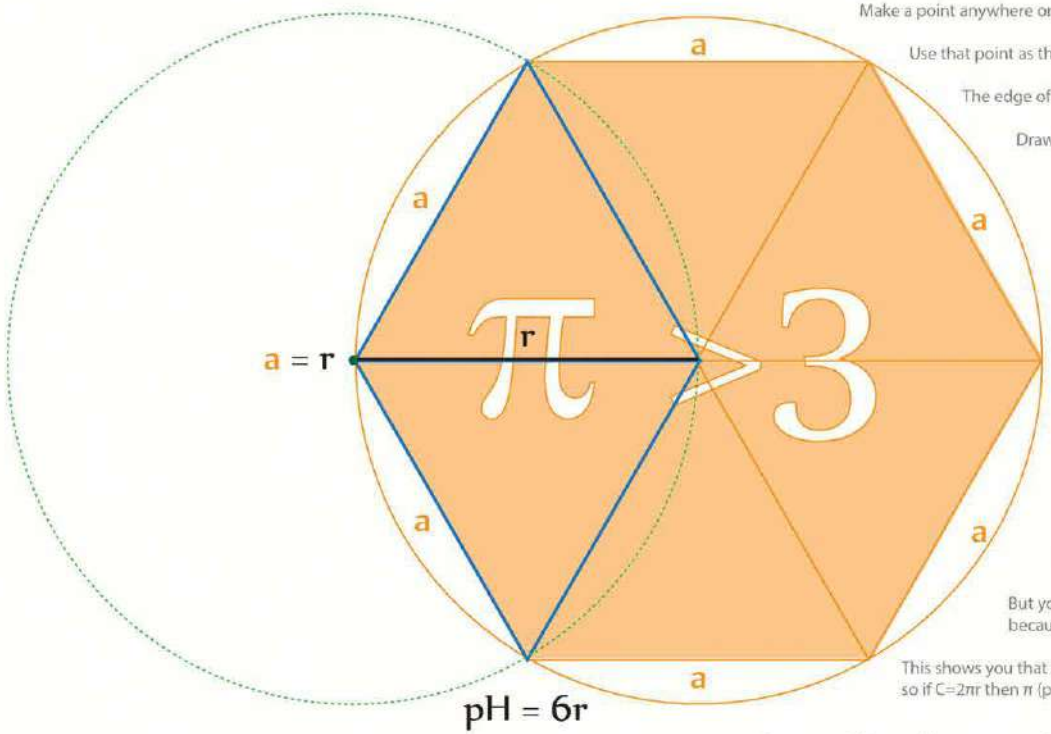
Use that point as the center of a second [blue] circle with the same radius as the green circle.

The edge of the blue circle should touch the center of the green circle.

Draw the line segment connecting the centers of the two circles.

That forms the radius of both of the circles.

Now draw the line connecting the center of the blue circle to where it crosses the green circle
on both sides, and complete the triangles.



You should have two equilateral triangles whose sides are equal to the radius of the green circle

Now extend all of the radius lines so they become diameter lines,
all the way across the circle, and finish drawing all of the triangles to connect them.

You've got six equilateral triangles now, that make an orange hexagon.

So the perimeter of your hexagon is the same as six times the radius of your circle.

But your circumference is a little bigger than the perimeter of your hexagon,
because the shortest distance between two points is always a straight line.

This shows you that the circumference of the blue circle has to be more than 6r,
so if C=2πr then π (pi) has to be a little bigger than 3, which it is.

The more sides we draw on our polygon, the closer we will get to the real value of pi (3.14159 etc.).
Using a polygon with 96 sides, Archimedes was able to calculate that π was a little bigger than 3.1408

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The Golden Ratio

Two quantities are in the golden ratio (φ) if the ratio of the sum of the quantities to the larger quantity is equal to the ratio of the larger quantity to the smaller one.

The figure to the right illustrates the geometric relationship

[1.61803]

L — Interior line length [LM] of the bisector line is equal to 1/2 the side of the original triangle [BC] [AB] or [CA] — M

Φ

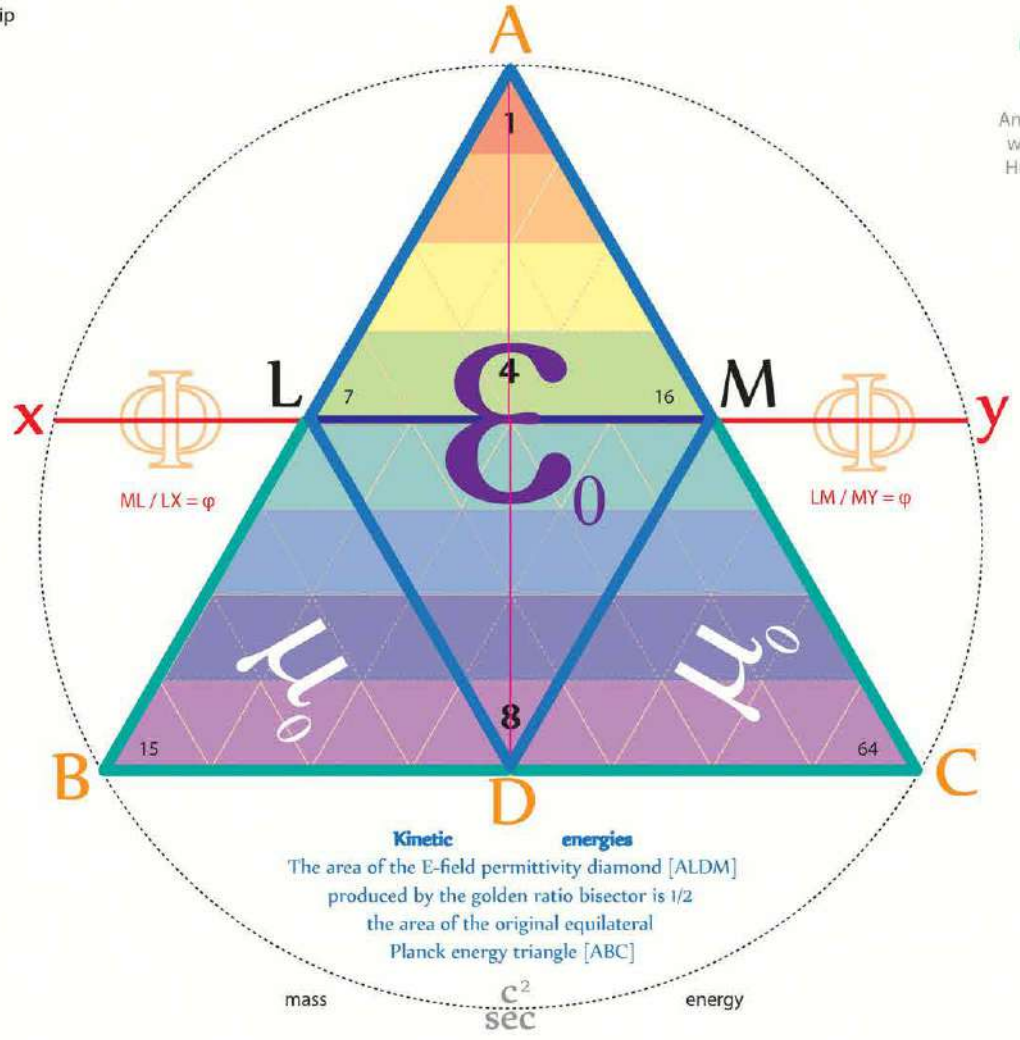
Golden ratio phi

$$\hbar = \frac{h}{2\pi}$$

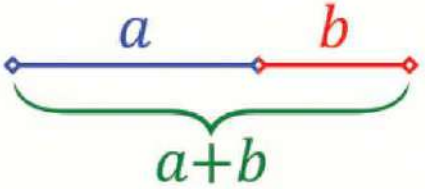
Tetryonic geometry reveals the maximum E-field amplitude of the reduced Planck constant to be an example of the Golden ratio in physics

velocity vectors

The height of the triangle [ALM] produced by the bisecting line is 1/2 the height of the height of [ABC]



Planck's constant [h]



$a+b$ is to a as a is to b

An intriguing showing of φ in an equilateral triangle was observed by George Odom, a resident of the Hudson River Psychiatric Center, in the early 1980s

M — The exterior lines [My] and [Lx] are Phi ratios of the interior line [LM] — y

Let L and M be the midpoints of the sides AB and AC of an equilateral triangle ABC

By measurement and the Intersecting Chords Theorem

MX·MY = AM·MC.

which is of the form

(a + b)·b = a·a.

Denoting a/b = x, we see that

$1 + x = x^2$,

George Odom

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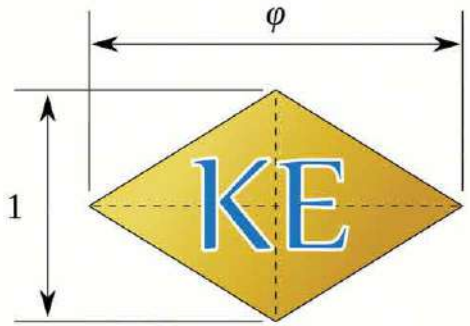
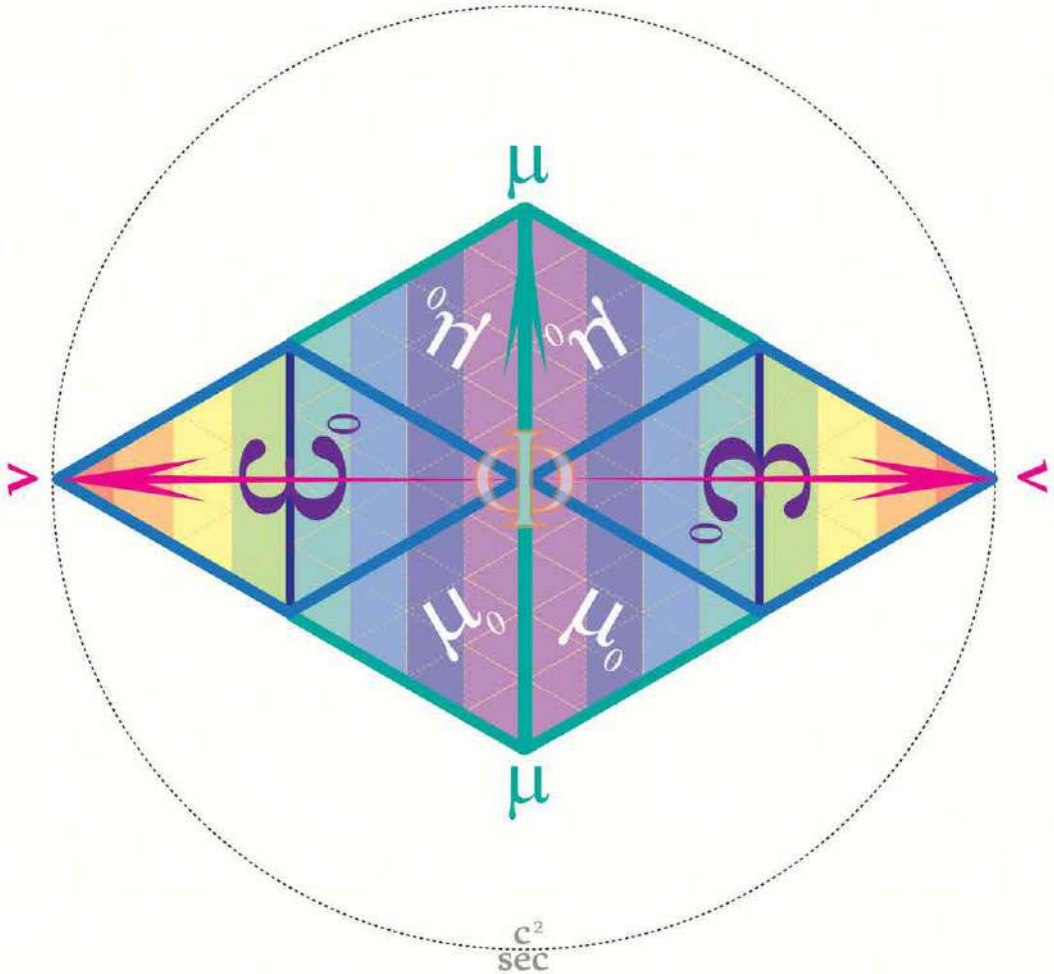


The Golden Rhombus

Applying the golden ratio (φ) to quantum scale electrodynamic geometry we can quickly determine that the linear momentum and magnetic moment vectors of photons & EM waves can also be expressed as a golden ratio

vector velocities
vs
magnetic vector

Φ
Golden ratio phi
[1.61803]



magnetic Force
vs
electric Force

photons
of
EM energy

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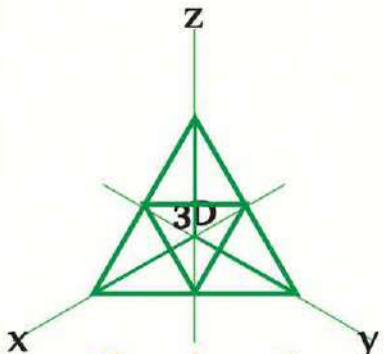
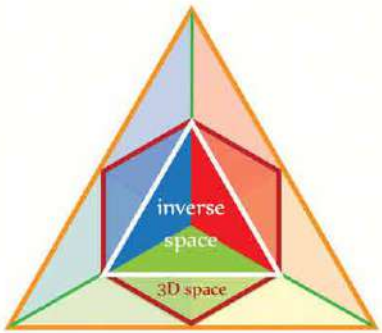
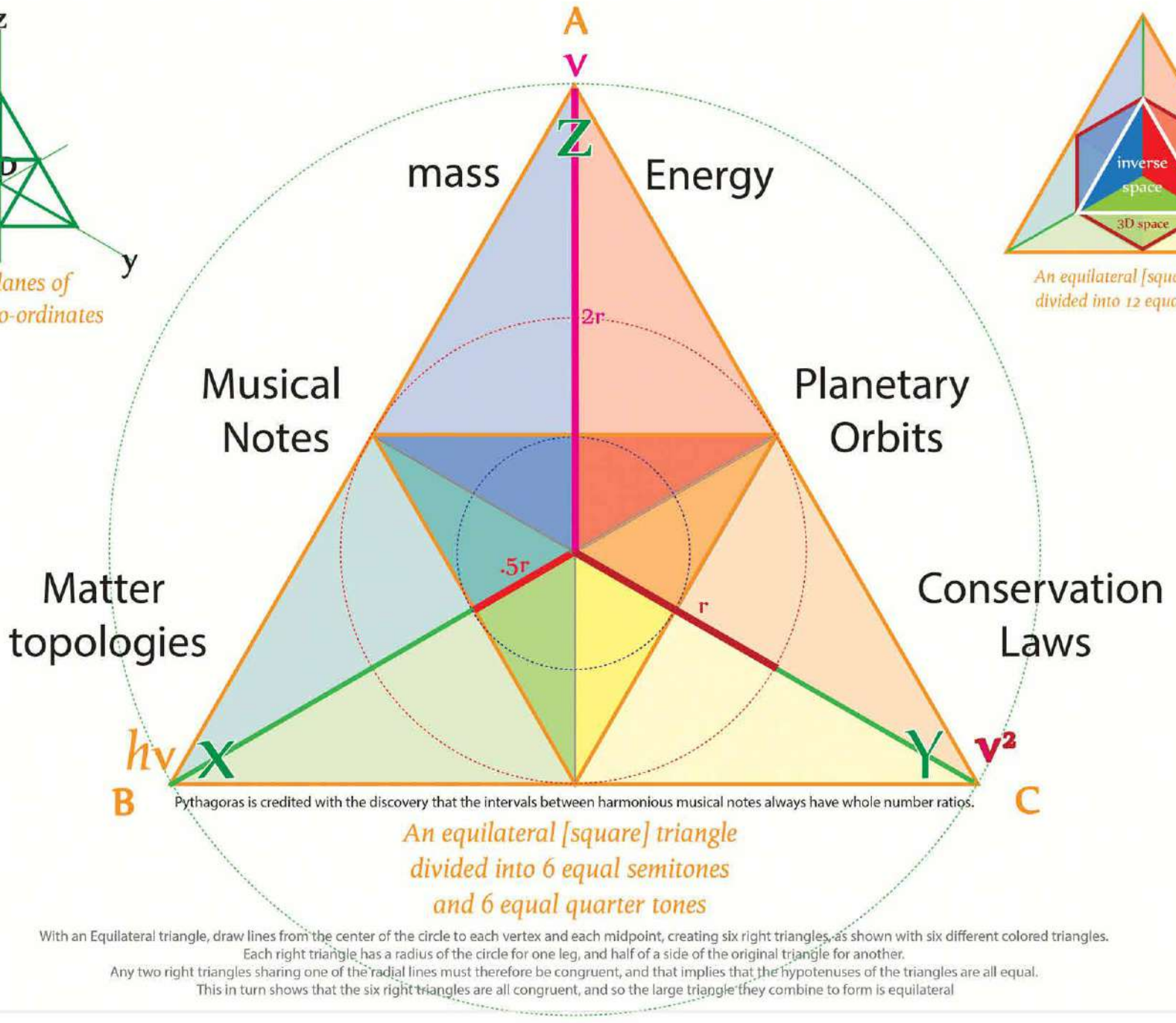


The 3 planes of Cartesian co-ordinates



An equilateral [square] triangle divided into 12 equal semitones



Pythagoras is credited with the discovery that the intervals between harmonious musical notes always have whole number ratios.

An equilateral [square] triangle divided into 6 equal semitones and 6 equal quarter tones

With an Equilateral triangle, draw lines from the center of the circle to each vertex and each midpoint, creating six right triangles, as shown with six different colored triangles.
Each right triangle has a radius of the circle for one leg, and half of a side of the original triangle for another.
Any two right triangles sharing one of the radial lines must therefore be congruent, and that implies that the hypotenuses of the triangles are all equal.
This in turn shows that the six right triangles are all congruent, and so the large triangle they combine to form is equilateral

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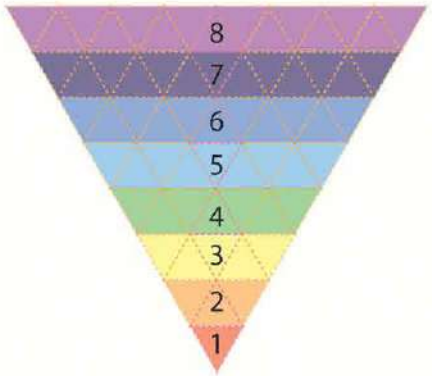
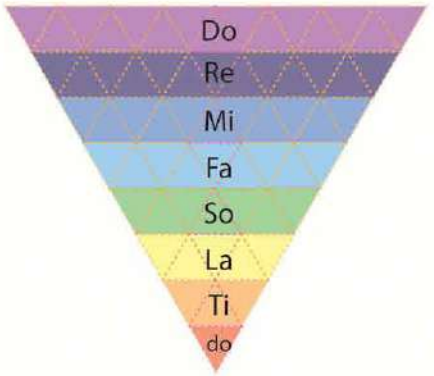
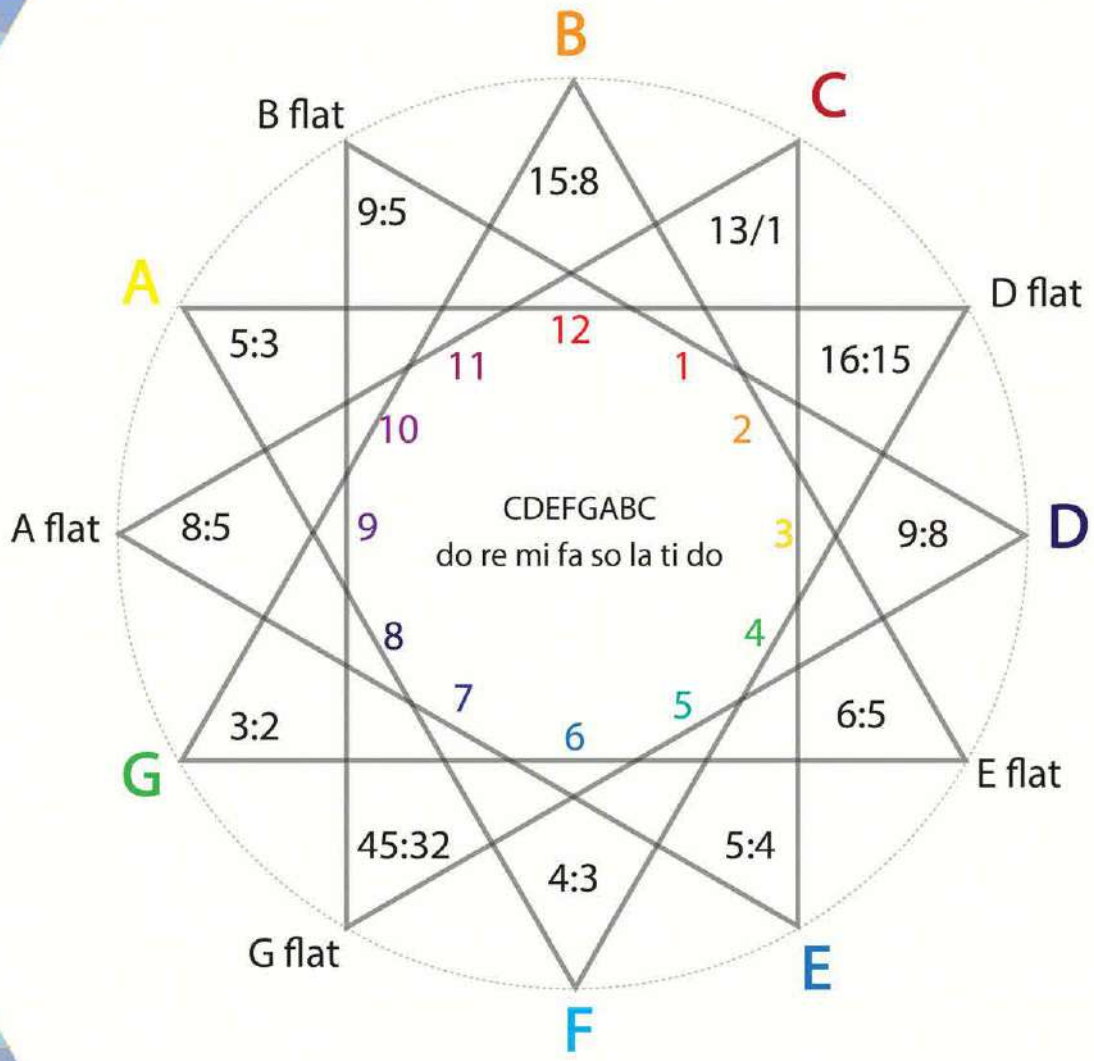
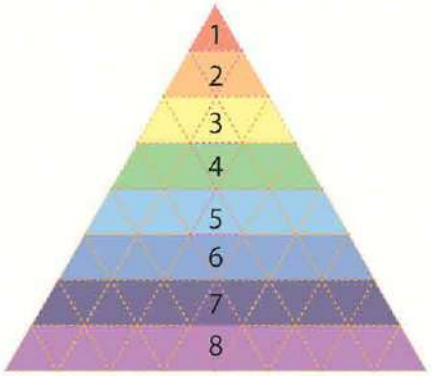
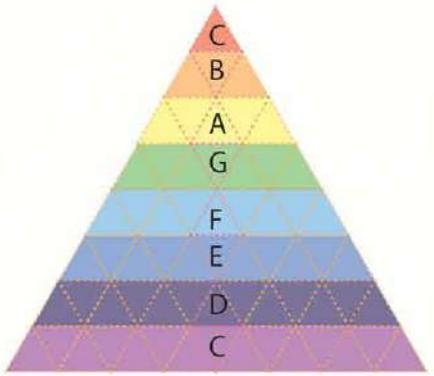
Equilateral Fifths











Musical Notes

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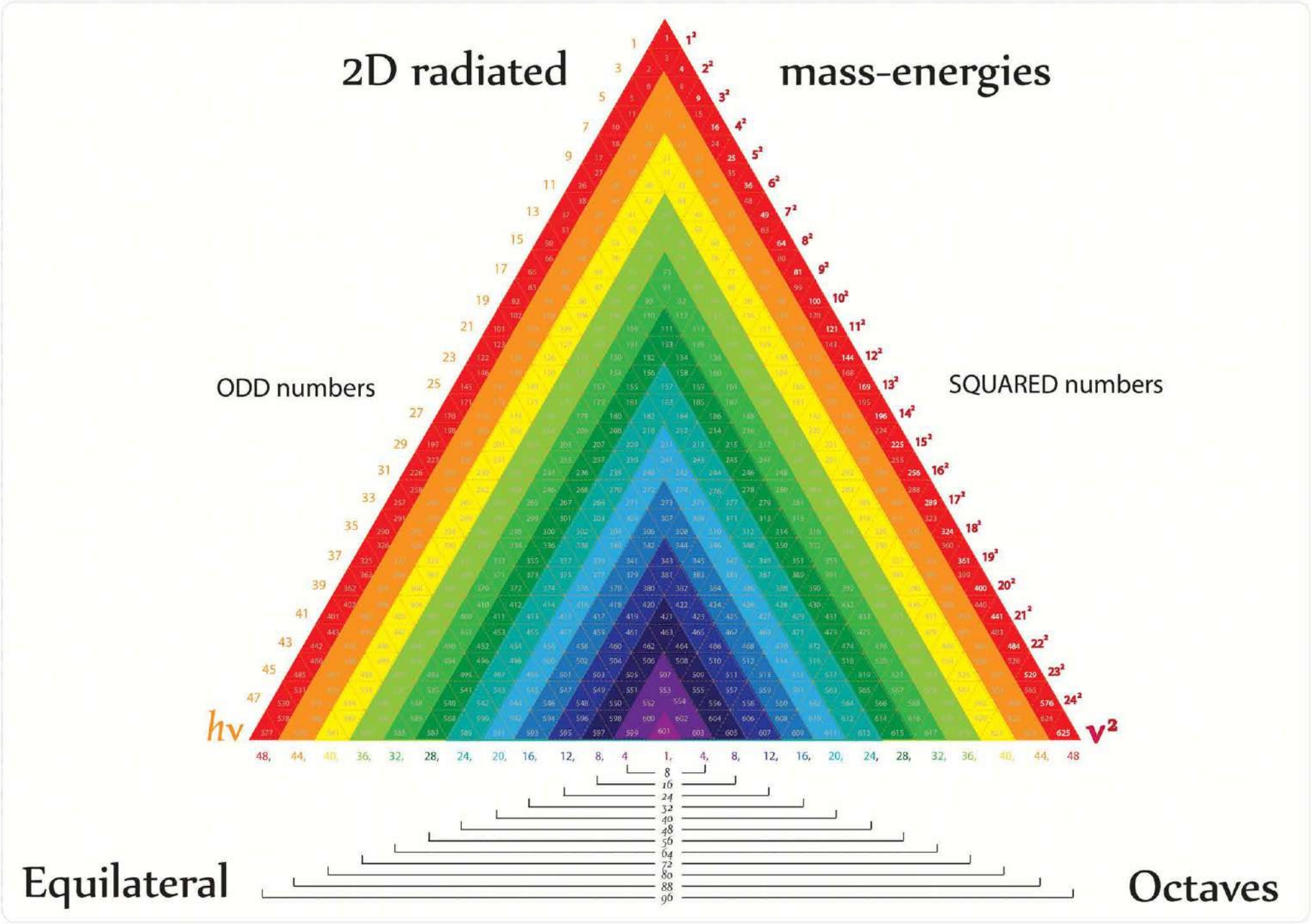

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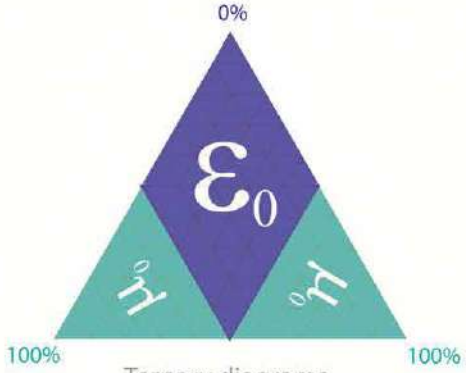
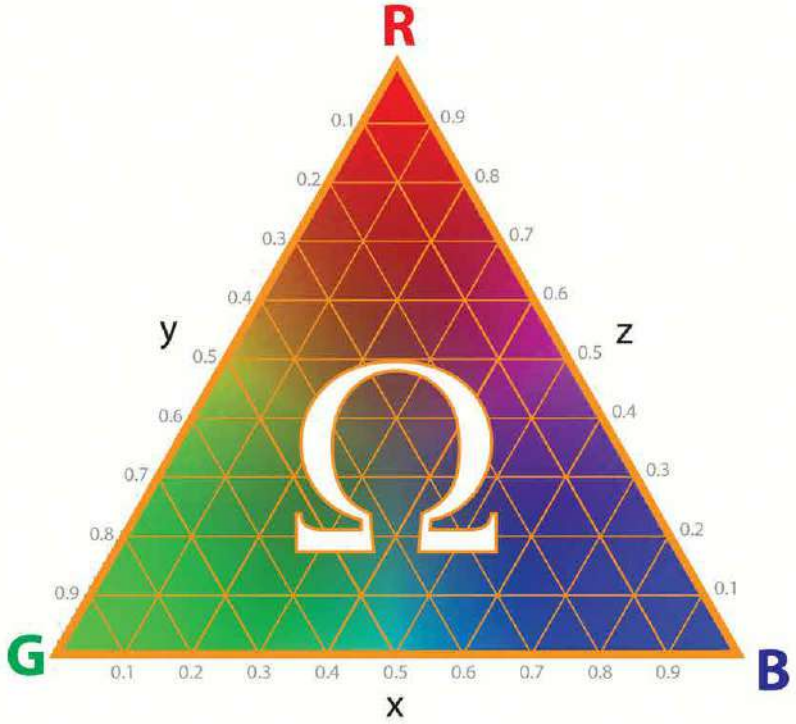
Ternary Diagrams

Viviani's Theorem implies that lines parallel to the sides of an equilateral triangle provide (homogeneous/barycentric/areal/trilinear) coordinates for ternary diagrams for representing three quantities A,B,C whose sum is a constant (which can be normalized to unity).

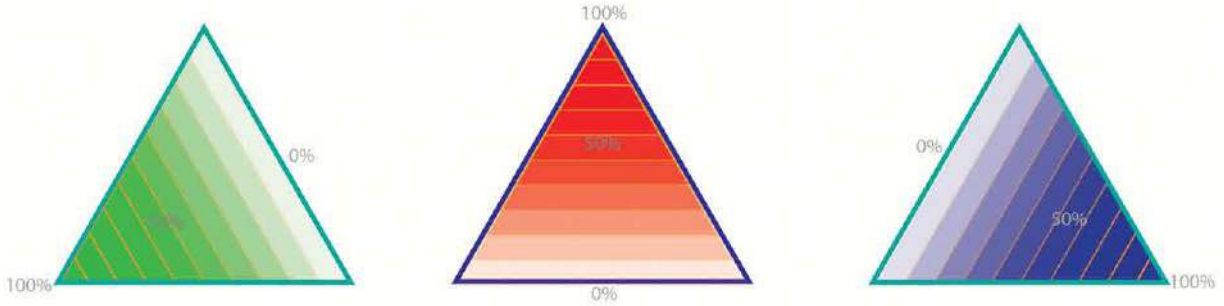


Ternary diagrams should NOT be used to model EM field strengths



In a ternary plot, of EM energy the Electric field [E] and the Magnetic dipole [N-S] must renormalise to 1

A ternary diagram is simply a triangular coordinate system in which the 3 edges correspond to the axes.



Trilinear charts are commonly used for finding the result of mixing three components (such as gases, chemical compounds, soil, color, etc.) that add to 100% of a quantity.

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Whilst the Pythagorean Theorem boasts a slightly greater economy of terms than the Eutrigon Theorem (Wayne Roberts 2003), the latter contains an important area not included in the former:

the area enclosed or swept out by the three points of the triangle in question

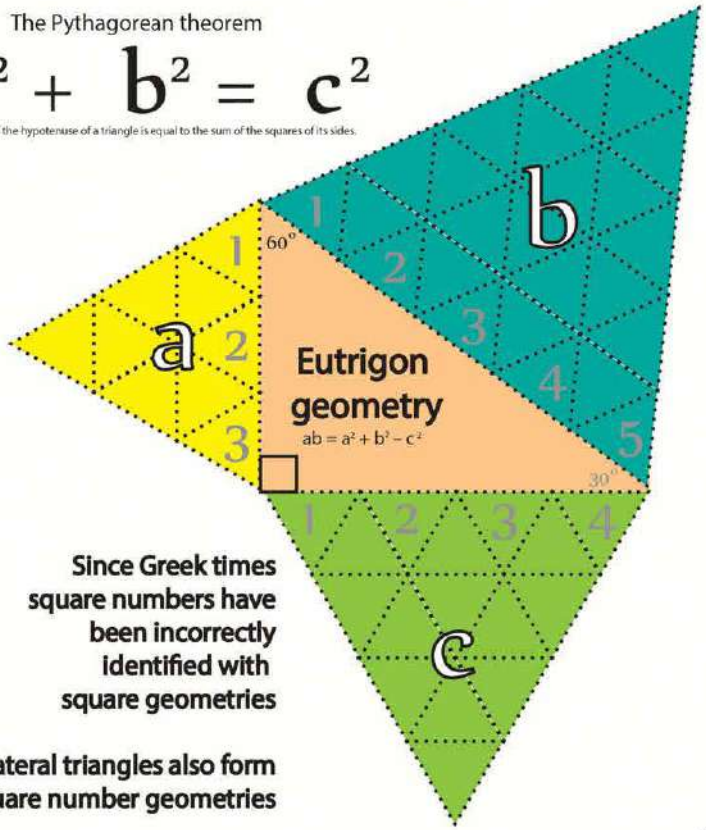
$$ab = a^2 + b^2 - c^2$$

the area of any eutrigon is equal to the combined areas of the equilateral triangles on legs 'a' and 'b', minus the area of the equilateral triangle on its hypotenuse 'c'.

The Pythagorean theorem

$$a^2 + b^2 = c^2$$

The square of the hypotenuse of a triangle is equal to the sum of the squares of its sides.



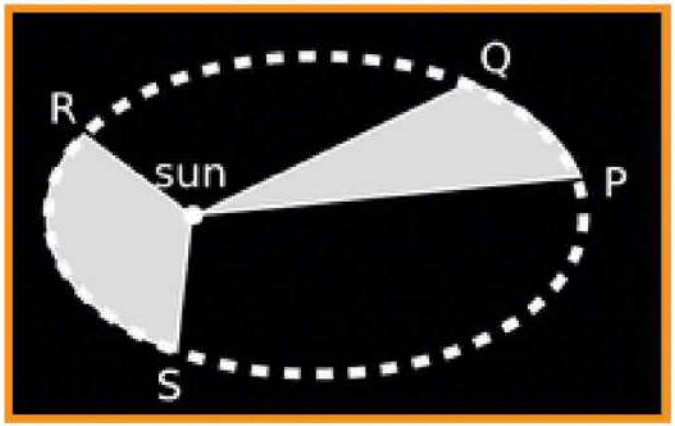
Since Greek times square numbers have been incorrectly identified with square geometries

Equilateral triangles also form square number geometries

Eutrigons

are an important new class of triangle (mathematically defined by Wayne Roberts), as the analogue of the right-triangle in orthogonal (Cartesian) coordinate geometry

Kepler's Second Law of planetary motion



The orbit of every planet is an ellipse with the Sun at one of the two foci.

A line joining a planet and the Sun sweeps out equal areas during equal intervals of time.

The algebraic form of the Eutrigon Theorem, (like the algebraic form of Pythagoras' Theorem), is proven to be special case of the Cosine Rule...

Tetryonic theory reveals the equilateral [square] energy geometry that reveals the 'harmonics at play' in physical laws such as the second law of Kepler, and in many other phenomena in physics, chemistry, cosmology, biochemistry and number theory thus providing the foundation for the mathematics of quantum mechanics

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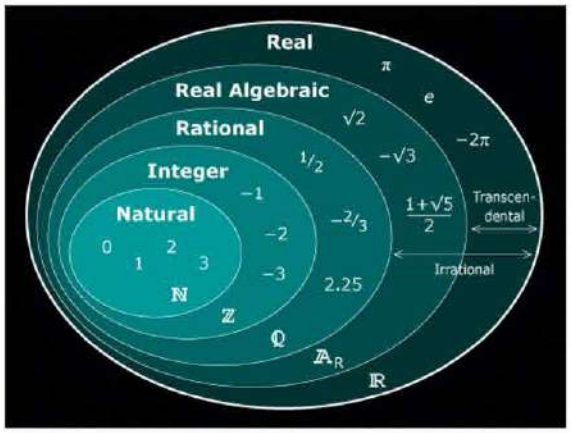
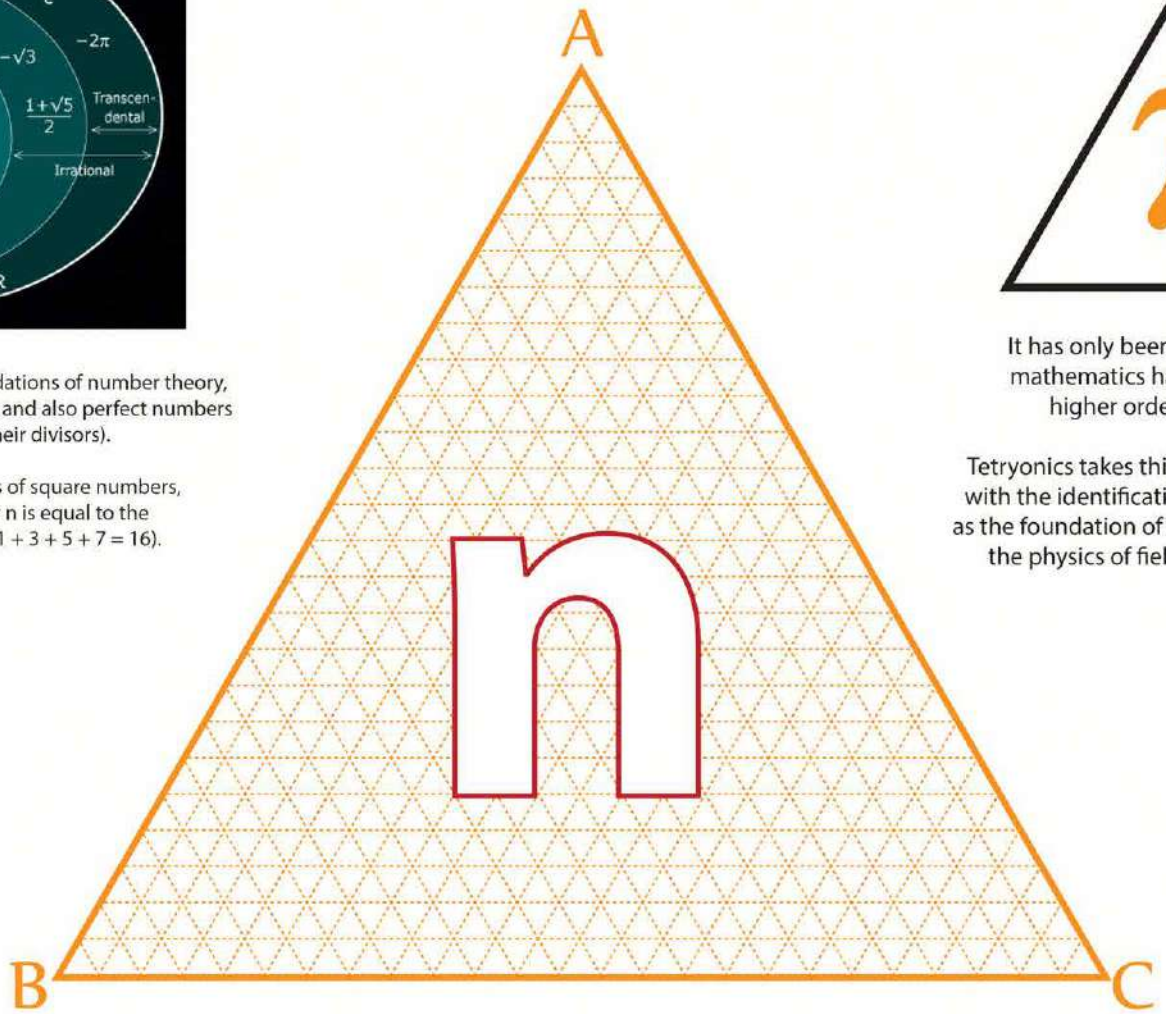
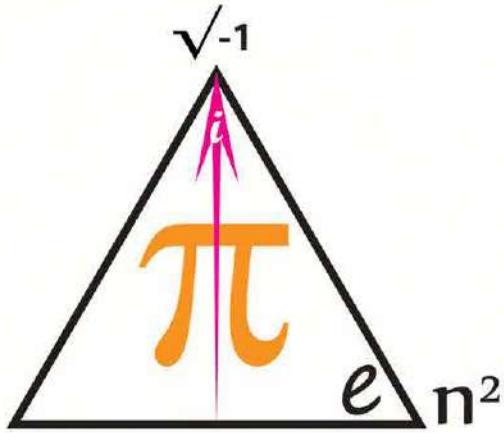
Number theory



The Pythagoreans also established the foundations of number theory, with their investigations of triangular, square and also perfect numbers (numbers that are the sum of their divisors).

They discovered several new properties of square numbers, such as that the square of a number n is equal to the sum of the first n odd numbers (e.g. 1 + 3 + 5 + 7 = 16).





It has only been in recent centuries that mathematics has begun to explore the higher order irrational numbers

Tetryonics takes this investigation to new levels with the identification of equilateral geometries as the foundation of transcendental numbers and the physics of fields and particles in motion

What mathematics has failed to appreciate is the significance application of equilateral geometries to the 'square' numbers of physics and science in general

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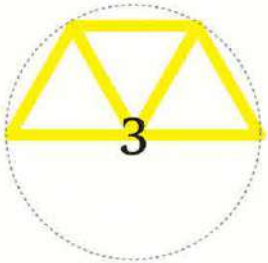
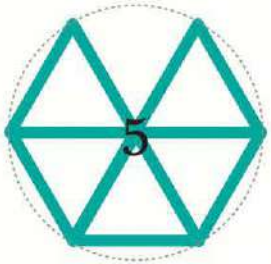
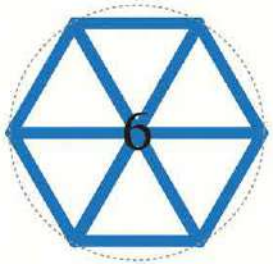
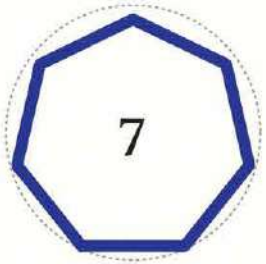
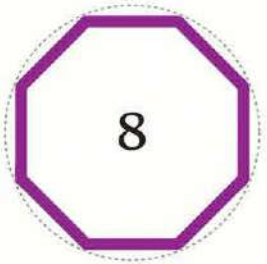


TETRYONICS

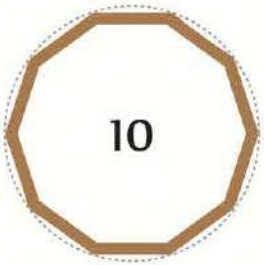


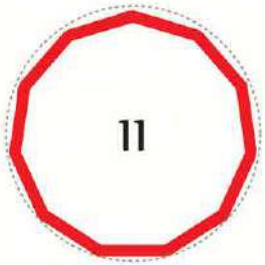






COUNTING POLYGONS





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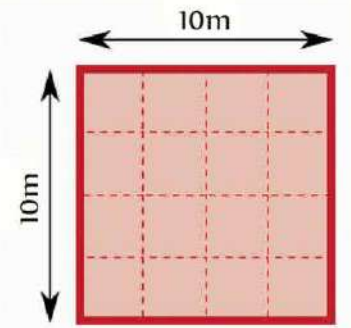
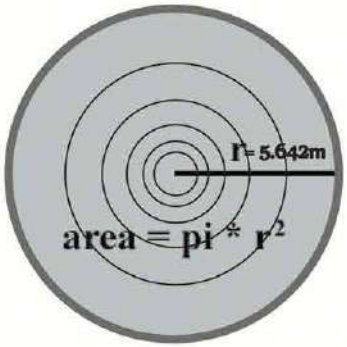
SQUARED energies in quantum mechanics are EQUILATERAL geometries



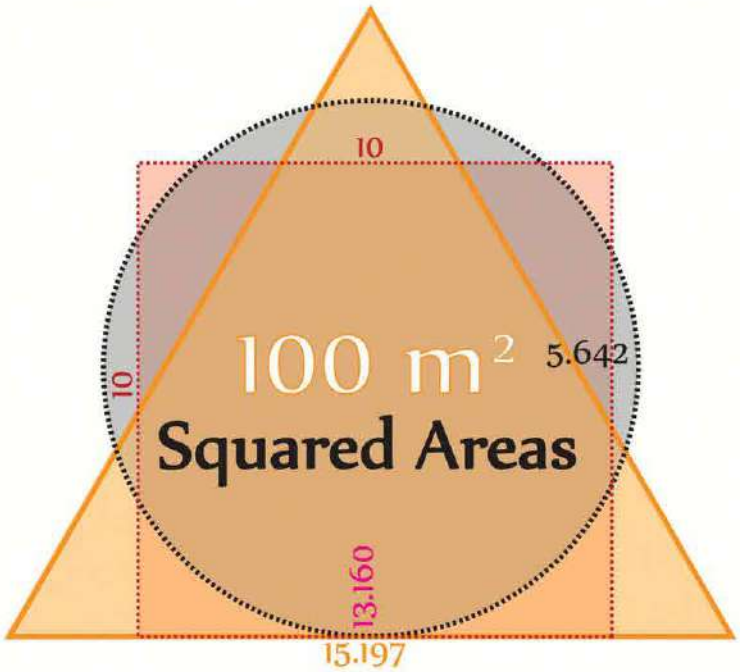
Square

area = s^2 = [100]

Circles



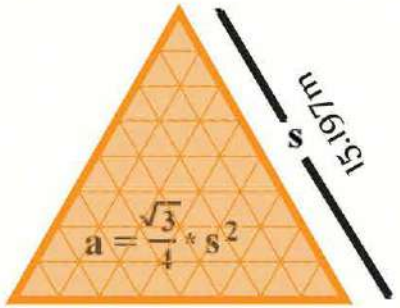
= pi *$[5.642]^2$
= 100



can be created by a number of planar geometries

For a long time it has been assumed by scientists (and mathematicians) that circular [and squared] geometries are the geometric foundation of all physics, leading to a serioulsy flawed model of particles and forces in quantum mechanics

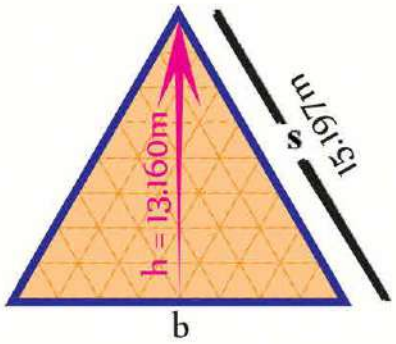
Tetryonic theory now reveals that quantised equilateral angular momenta creates the foundational geometry of all the mass-Energy-Matter & forces of physics



Equilateral

area = $(\frac{1}{2}*b)*h$

Triangles



b h
[.5x15.197] x 13.160
= 100

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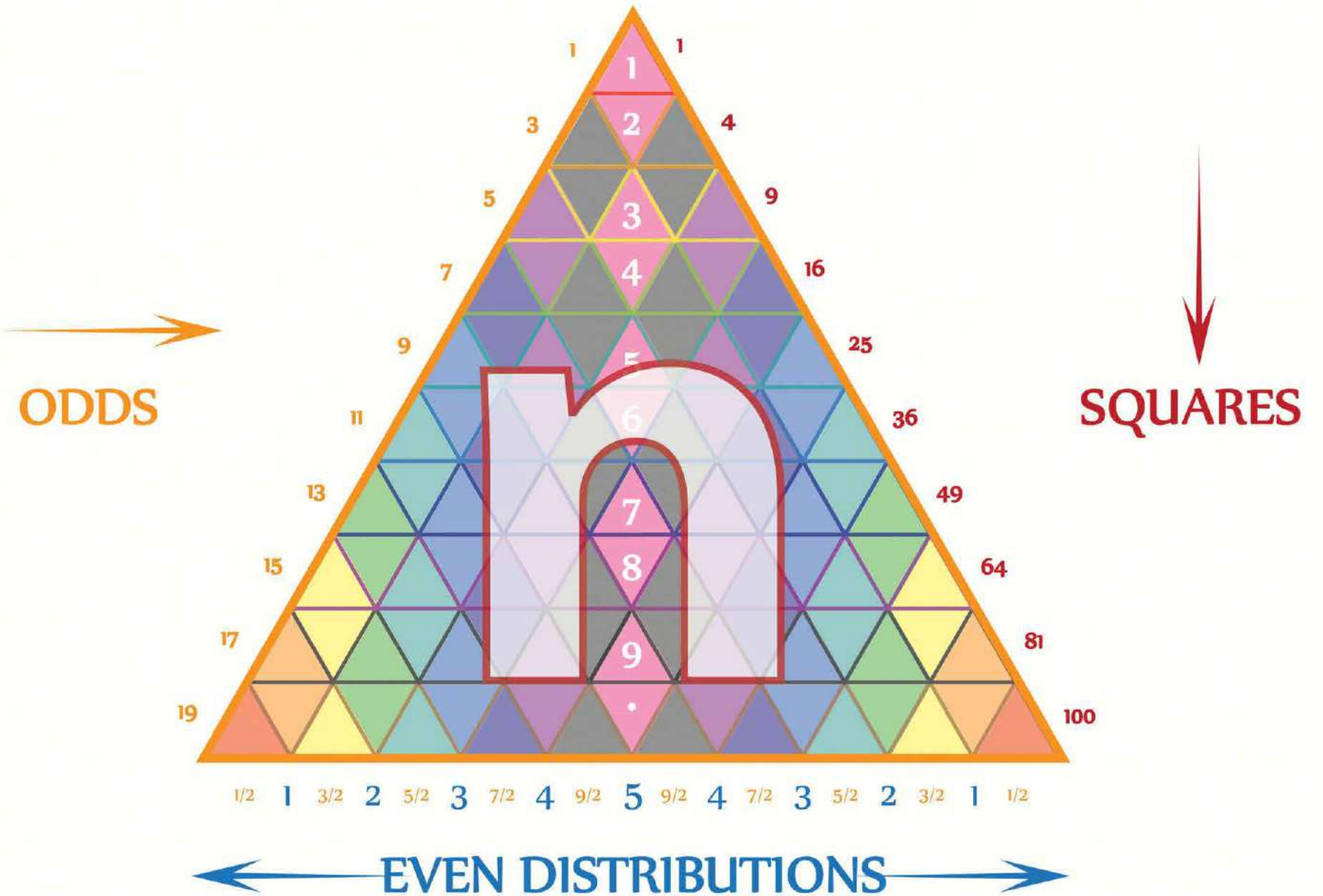
0.987654321

SQUARE ROOTS

80/81



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Integers

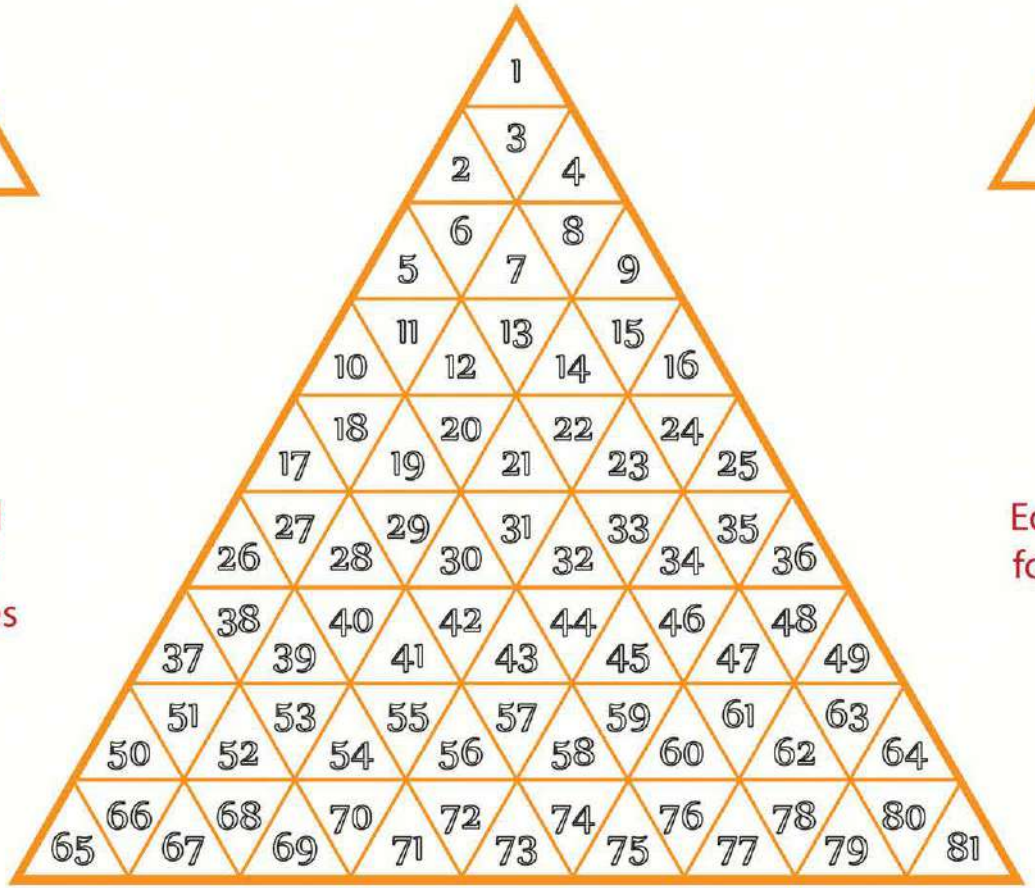
The integers (from the Latin integer), literally "untouched", hence "whole"
in Tetryonics it is the basis for the Planck charge quantum

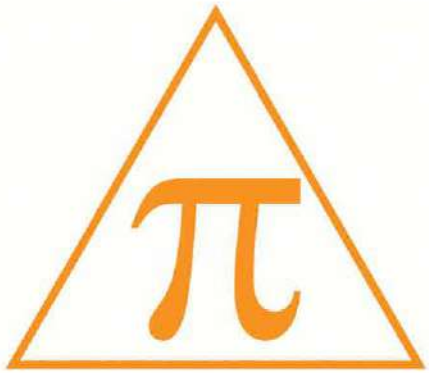
$$2n-1$$

$$[n] + [n-1]$$

Triangular numbered geometries are NOT equialteral geometries

0, 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...





$$\sum_{1}^{n} [2n-1]$$

Equilateral geometries form **SQUARE** number geometries

1, 4, 9, 16, 25, 49, 64, 81, 100, 121, 144, ...

Equilateral energy quanta form a normal longitudinal distribution

Viewed as a subset of the real numbers, they are numbers that can be written without a fractional or decimal component

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Bosons are a transverse measure of scalar energy momenta

ODD numbers

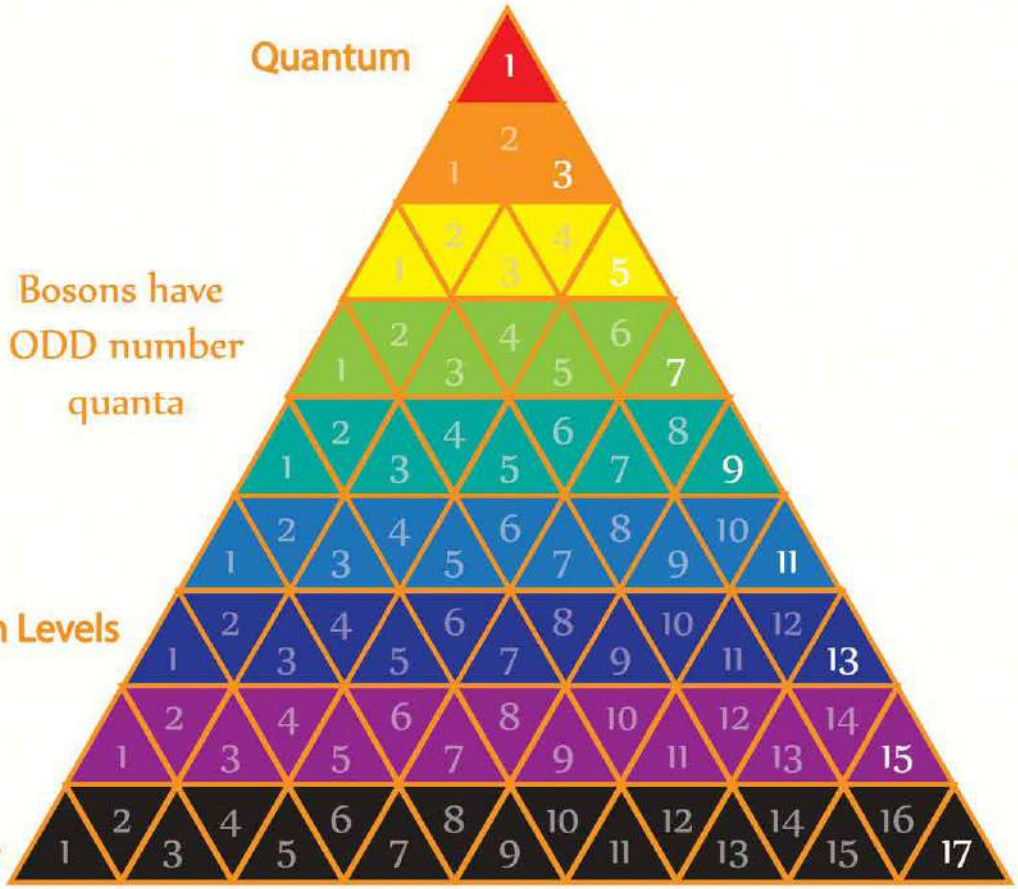
An odd number is an integer which is not a multiple of two.

Quantum

Bosons have ODD number quanta

Quantum Levels

$h\nu$



1 3 5 7 9 11 13 15 17

An odd number, when divided by two, will result in a fraction

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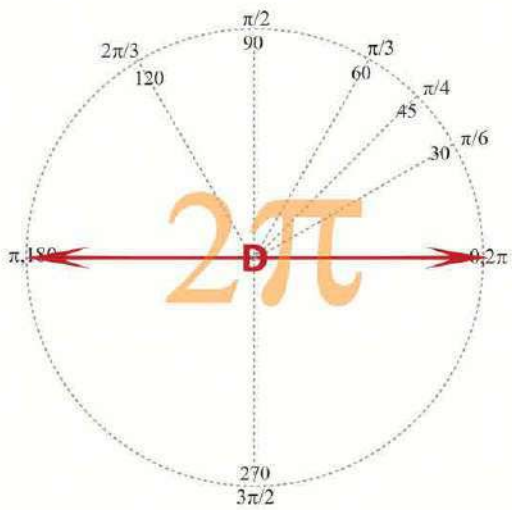
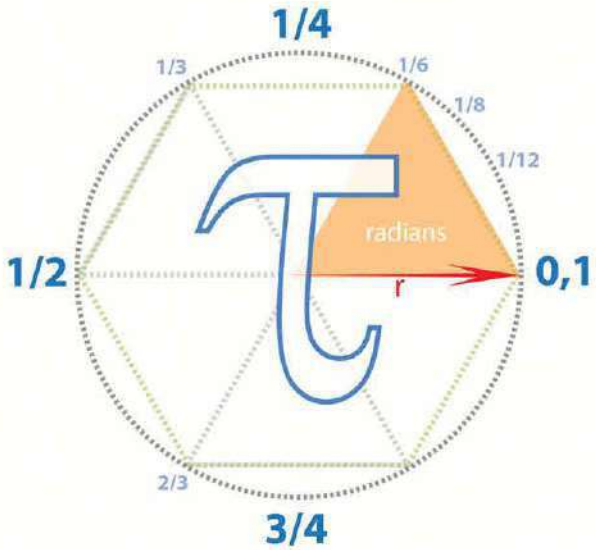
Tau radians

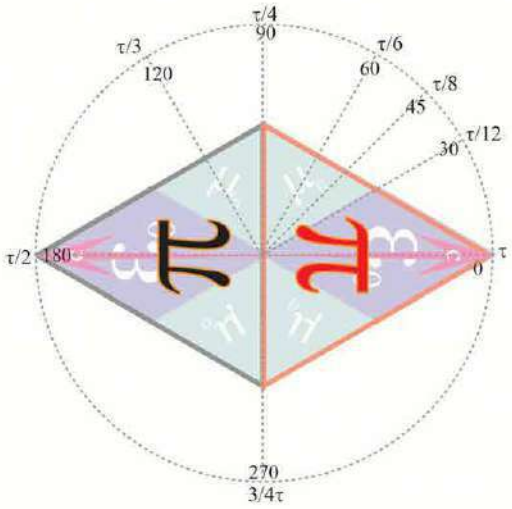
Around the whole outside of a circle,
there are about 6.283 radians - or, Tau radians

3.141592654

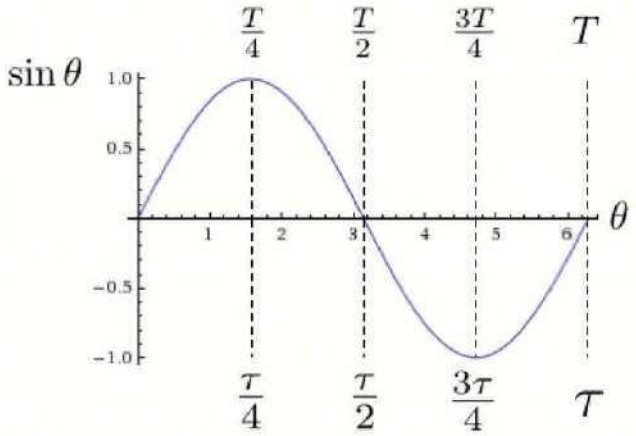




6.283185307



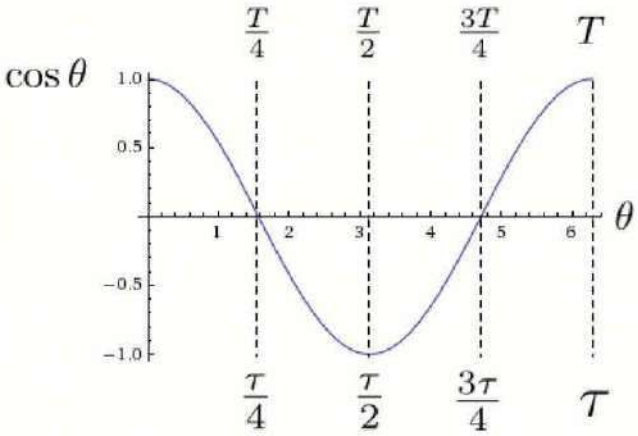
τ is a more 'natural' radian system for geometric physics than π
Tau = 2π = 360 degree rotation about a point



π
historically defined as the
ratio of a circle's circumference to its DIAMETER
should be redefined in physics to

τ
the ratio of its circumference to its RADIUS

in doing so many of the π/2 terms common to physics
will re automatically rationalised and will better reflect
the Tetryonic geometry of mass-ENERGY-Matter in motion



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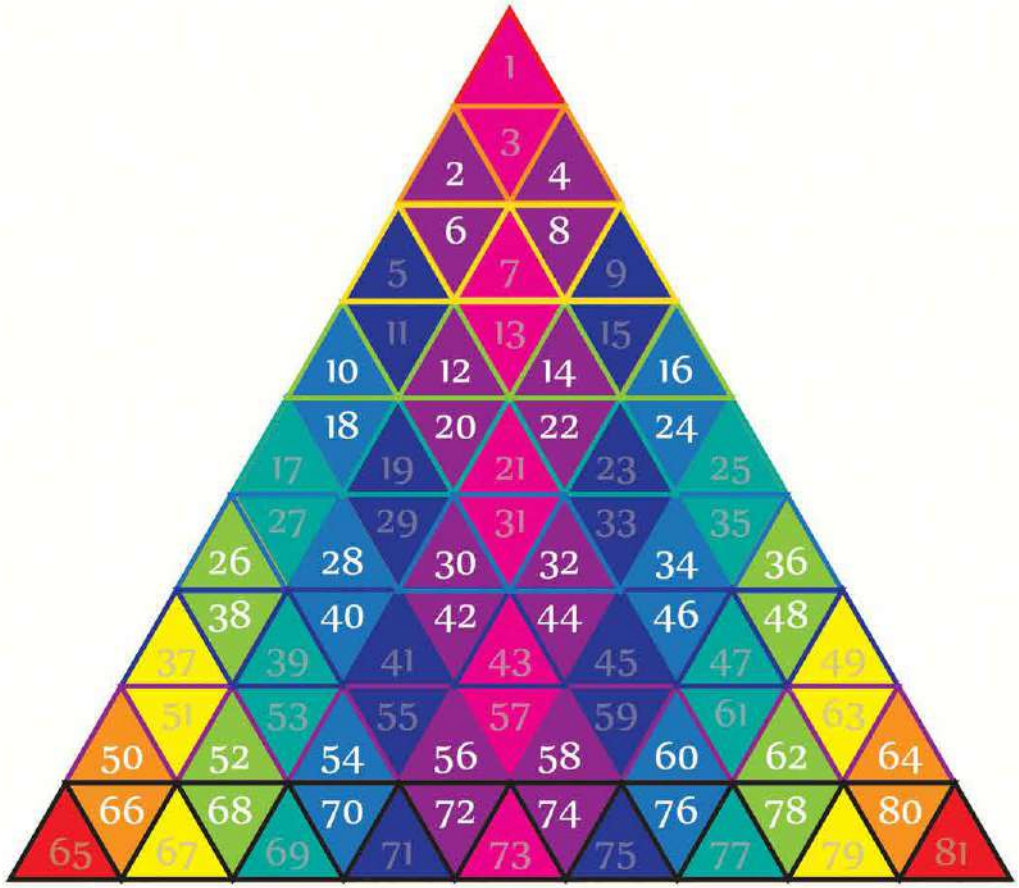
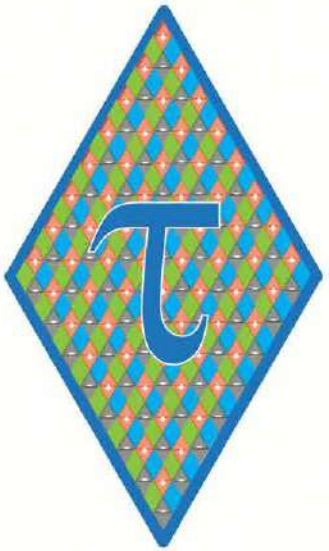
Photons are a longitudinal measure of scalar energy momenta

Photons are EVEN number quantums

EVEN numbers

An integer that is not an odd number is an even number





EM waves are comprised of EVEN numbered quanta

If an even number is divided by two, the result is another whole number

1/2 1 3/2 2 5/2 3 7/2 4 9/2 4 7/2 3 5/2 2 3/2 1 1/2

If an odd number is divided by two, the result is a fractional number

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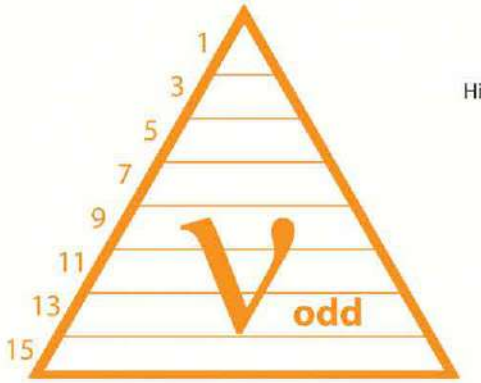
Triangular numbers

Historically, a triangular number counts quanta that can pack together to form an equilateral triangle

1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...

this form of geometric counting of same charges over-complicated the simpler physical reality

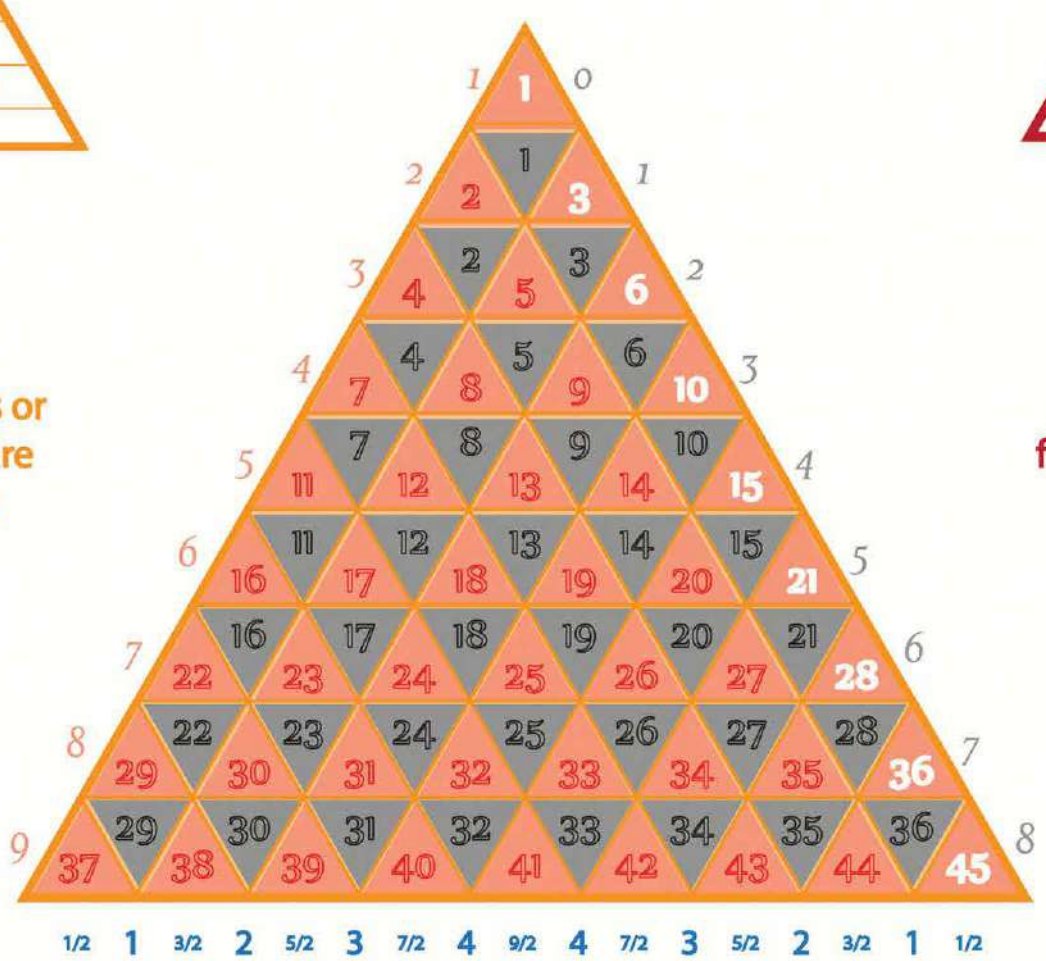


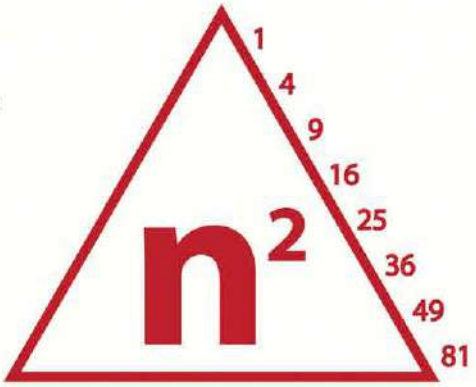
$$2v-1$$

$$[v] + [v-1]$$

Equilateral chords or quantum levels are ODD numbers

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21,....





$$\sum_{1}^{n} [2n-1]$$

Equilateral geometries form SQUARE numbered geometries

1, 4, 9, 16, 25, 49, 64, 81, 100, 121, 144, ...

1/2 1 3/2 2 5/2 3 7/2 4 9/2 4 7/2 3 5/2 2 3/2 1 1/2

Triangular energy quanta form normal distributions

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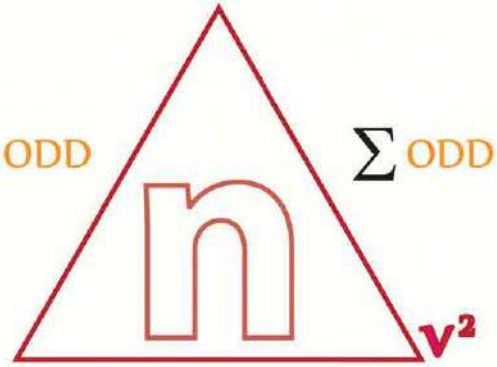
Squared numbers

A square number, sometimes also called a perfect square,
is the result of an integer multiplied by itself



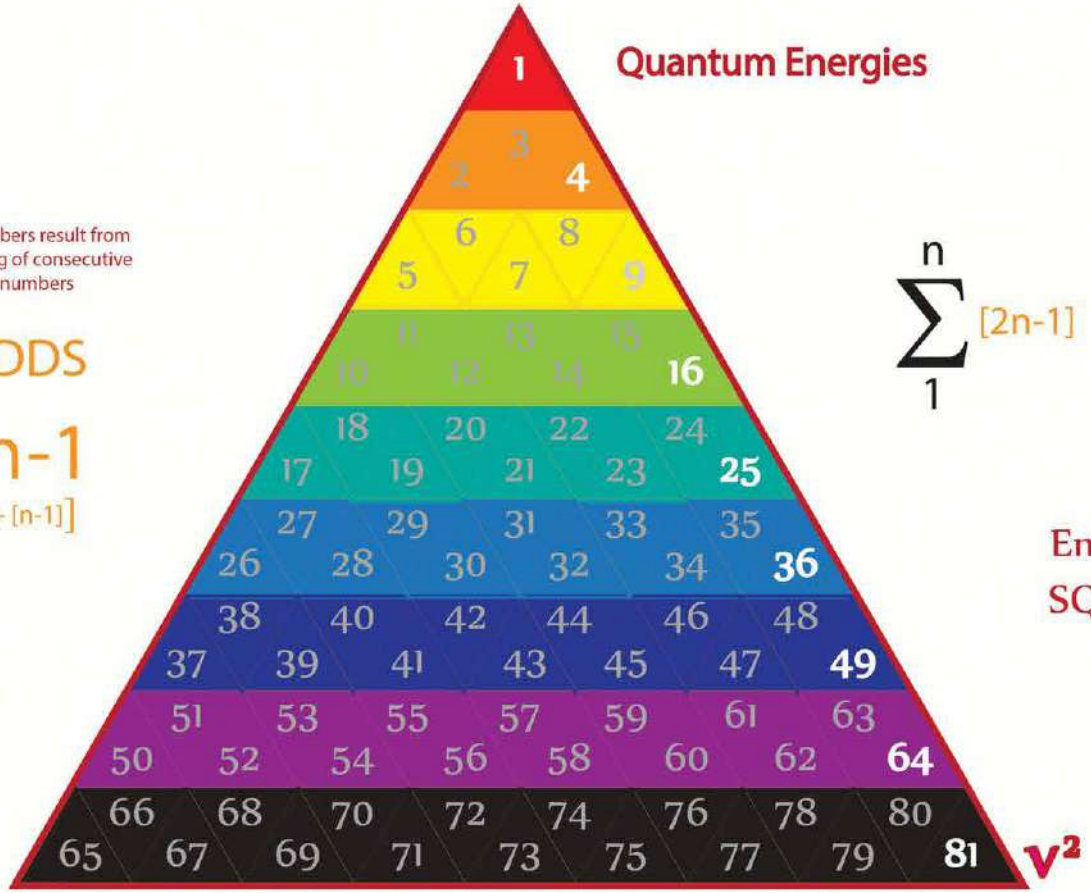
1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17

Square numbers result from the summing of consecutive ODD numbers

ODDS

2n-1

[n] + [n-1]



$$\sum_{1}^{n} [2n-1]$$

Energy levels have SQUARE number quanta

Compton Frequency

In Tetryonics Square numbers produce equilateral geometries

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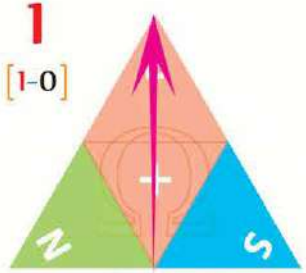
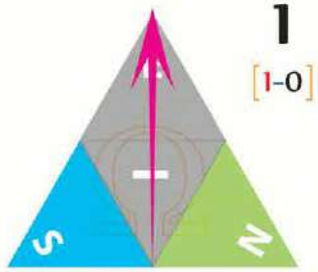
Square roots

A square root of a number is a number that, when it is multiplied by itself (squared) , gives the first number again.

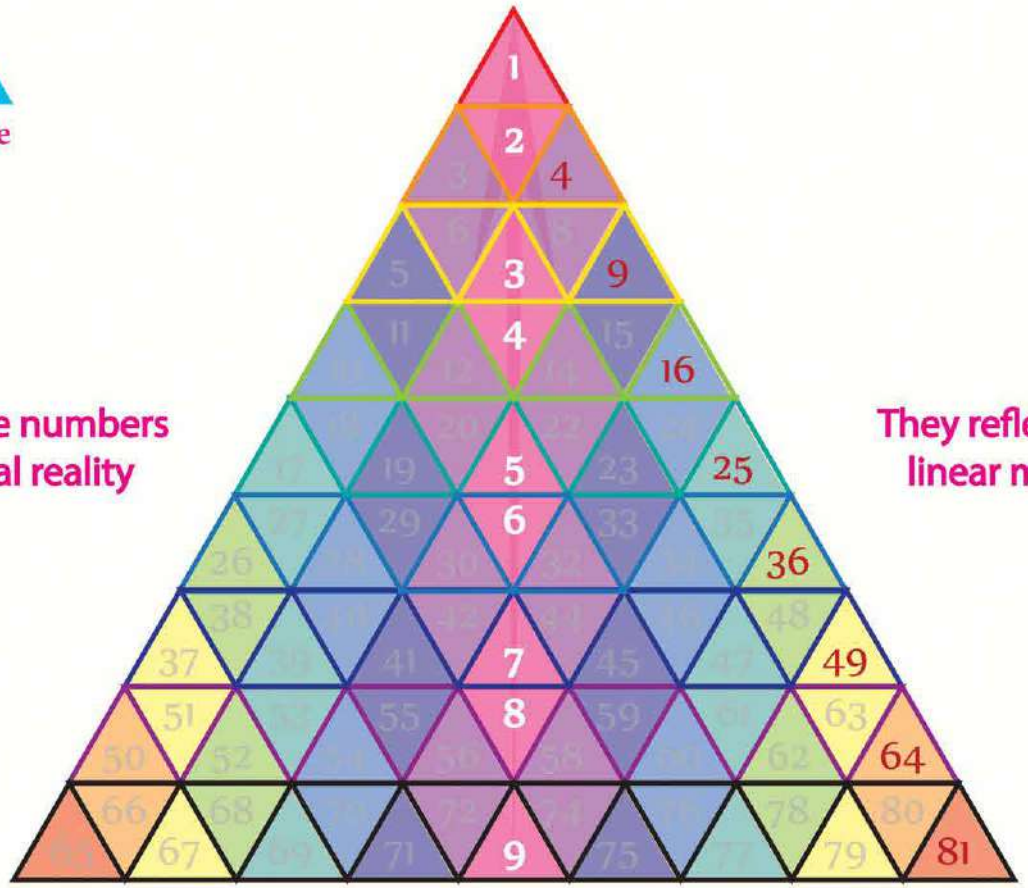


Root of positive one

-*i* and +*i*



Root of negative one



Square roots of negative numbers have a basis in physical reality

They reflect the real non-negative linear momentum of a system

A whole number with a square root that is also a whole number is called a perfect square
in Tetryonic theory they are actually equilateral geometries

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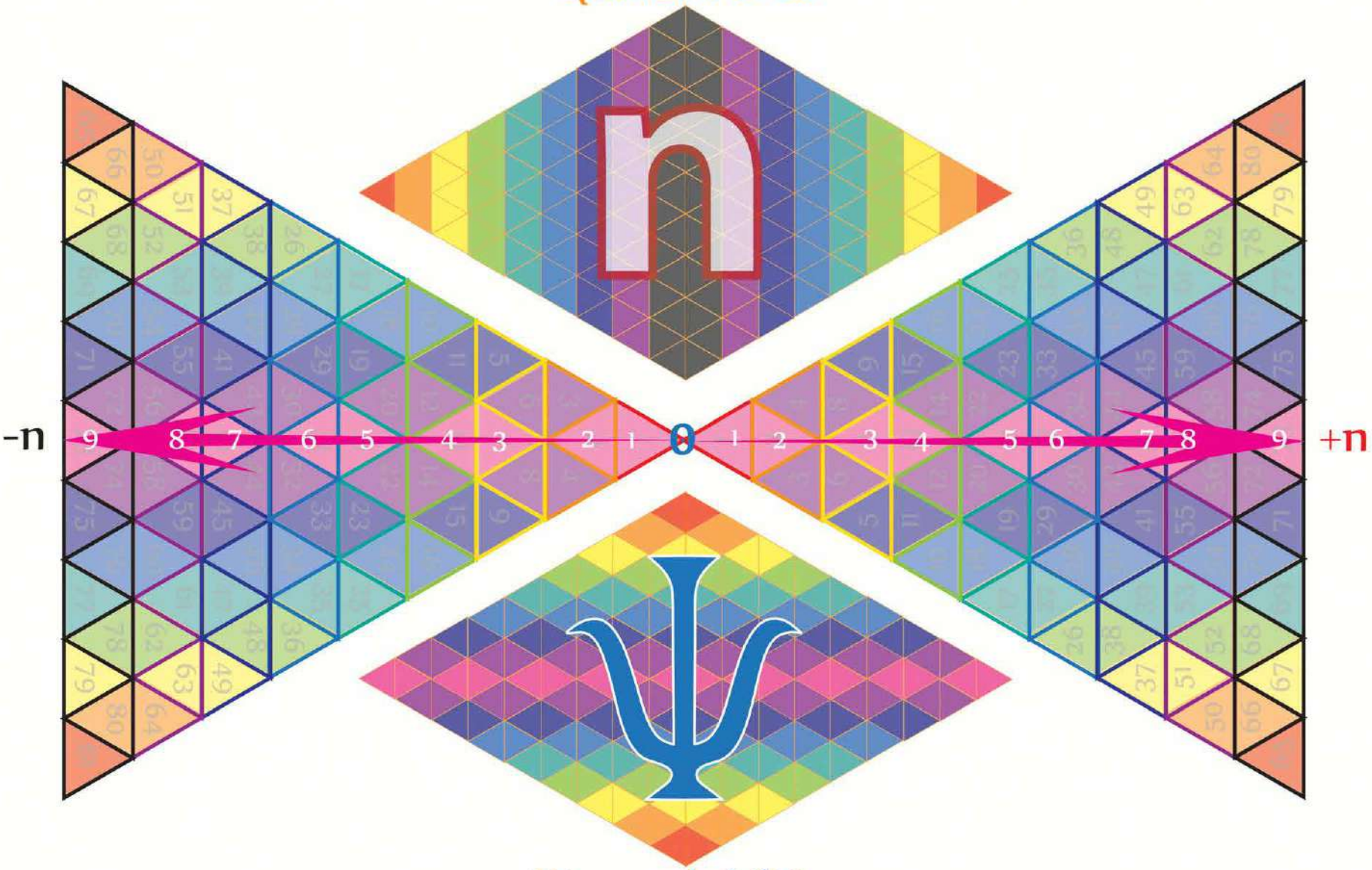
Real Numbers

In mathematics, a real number is a value that represents a quantity along a continuous line. The real numbers include all the rational numbers,

Quantum levels



Wave probabilities

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ONE to ∞^2

Quantum levels

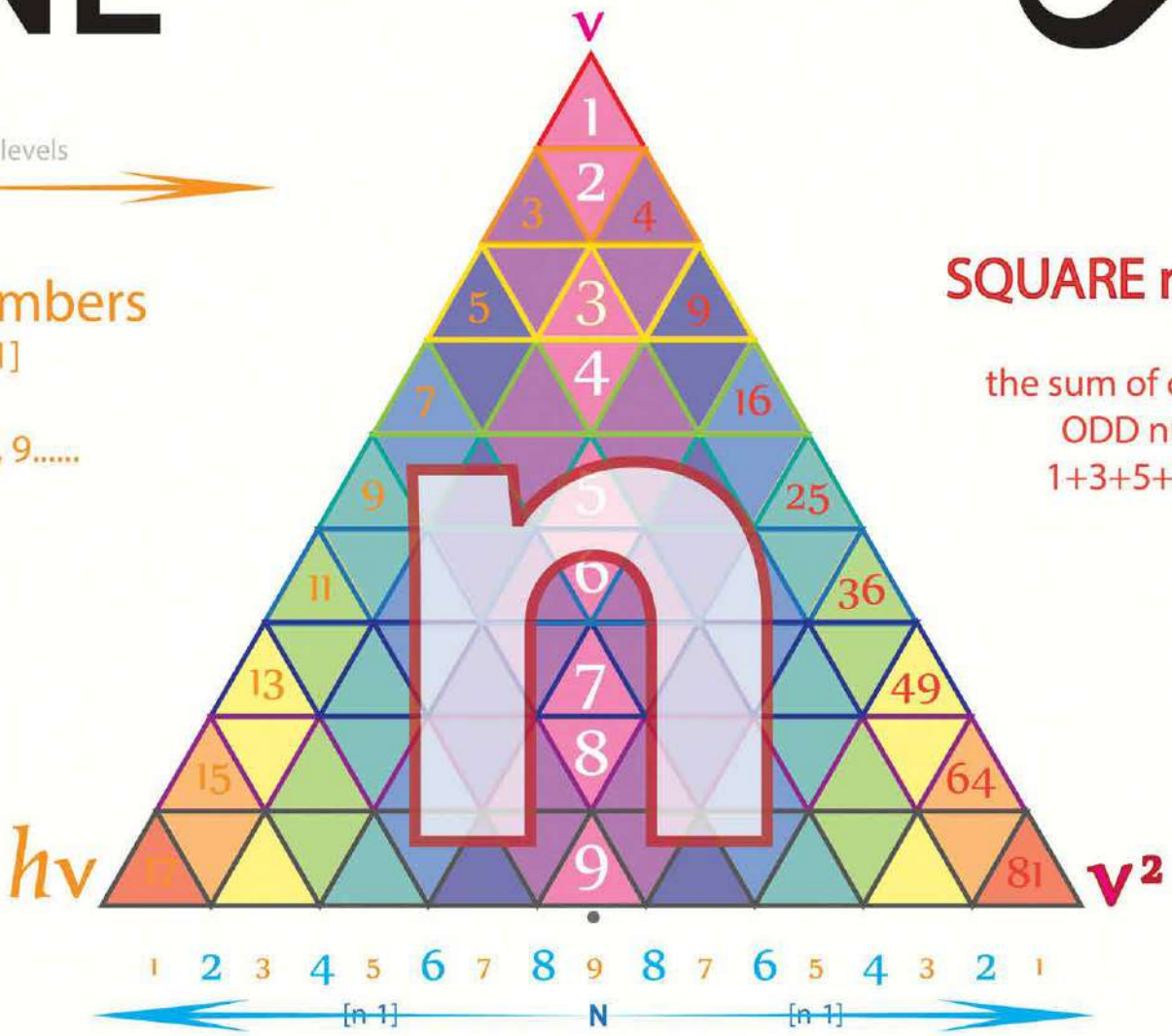
ODD numbers
[2n-1]

1, 3, 5, 7, 9.....

SQUARE numbers

the sum of consecutive
ODD numbers
1+3+5+7+9+.....

Scalar Energies



Linear energy momentum

NORMAL DISTRIBUTION

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Basic Properties of nested scribed Equilateral Triangles

Given an equilateral triangle of side s

altitude

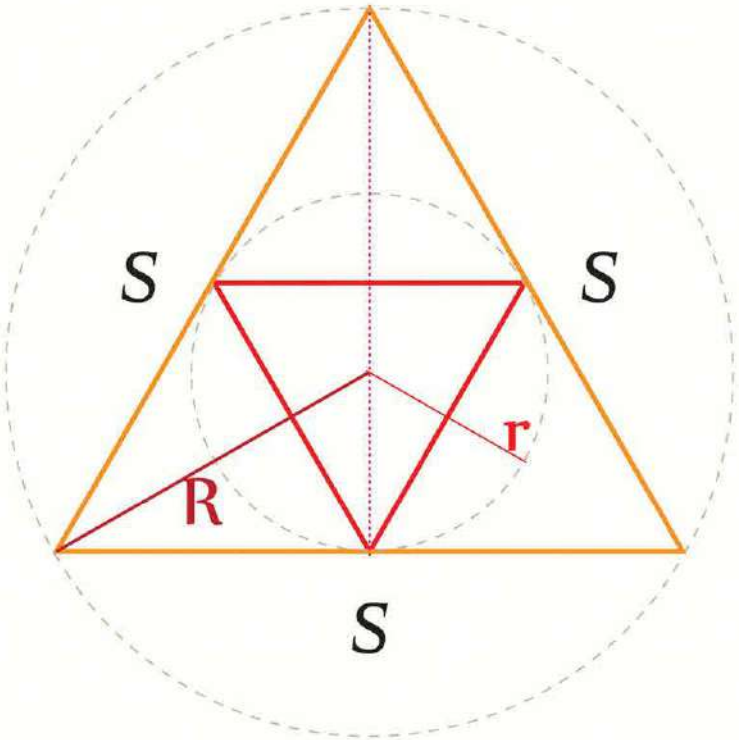
$\sqrt{3/2}\,S$

$3S$

perimeter

$\sqrt{3/4}\,S^2$

area



$\sqrt{3/6}\,S$

in-radius

$\sqrt{\pi/12}\,S^2$

in-circle area

circum-radius

$\sqrt{3/3}\,S$

circum-circle area

$\sqrt{\pi/3}\,S^2$

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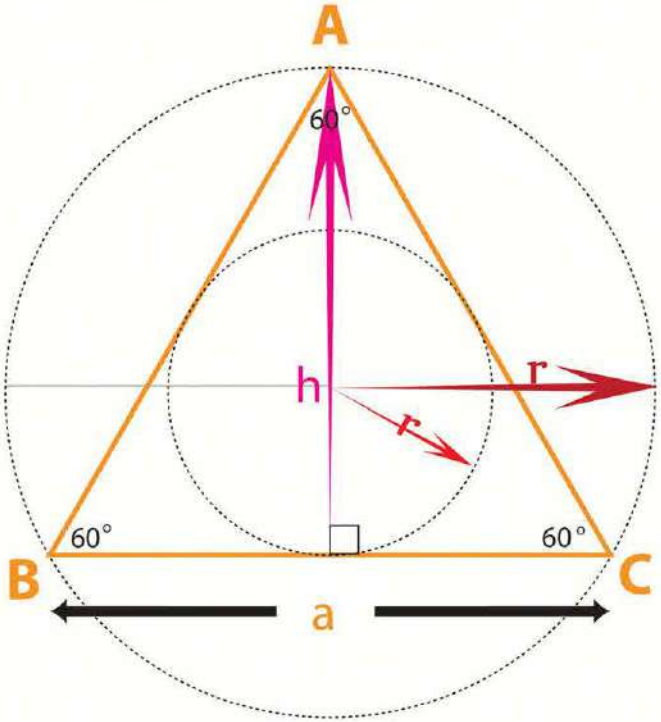
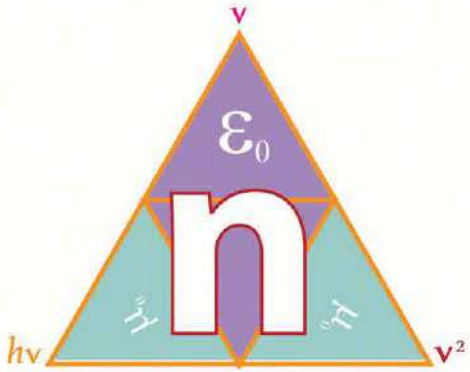
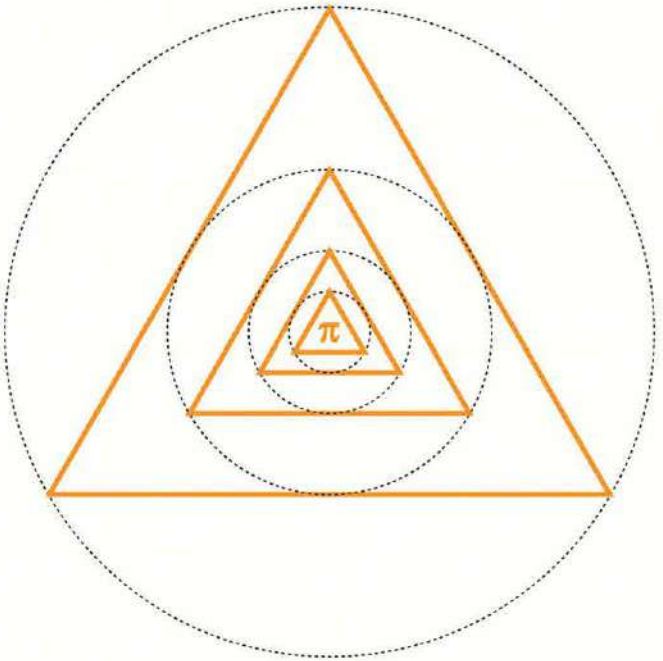
Tetryonic [equilateral] geometry

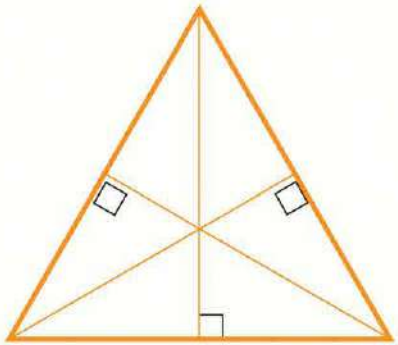




The equilateral triangle exhibits 'square symmetry'
it can always be divided into n^2 [number]
of smaller self-similar parts

All triangles are flat euclidean π radian geometries [180°]





An equilateral triangle is the most symmetrical triangle,
having 3 lines of reflection and rotational symmetry of order 3 about its center

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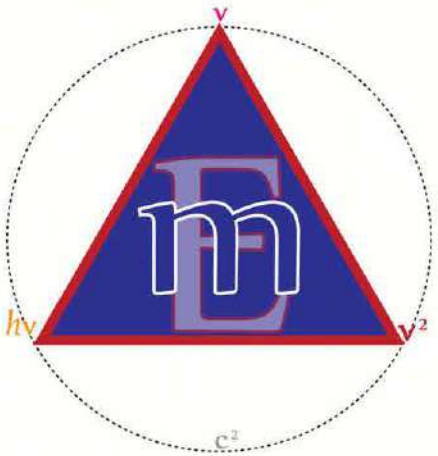
CHARGE

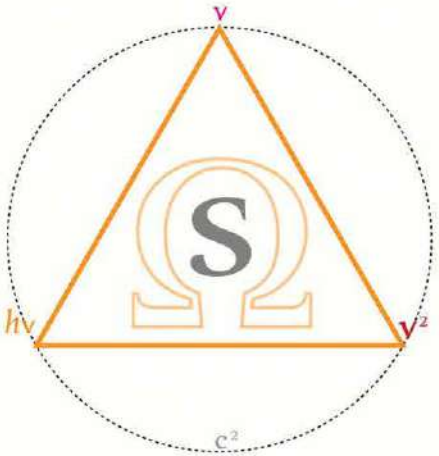
Scribed equilateral geometries

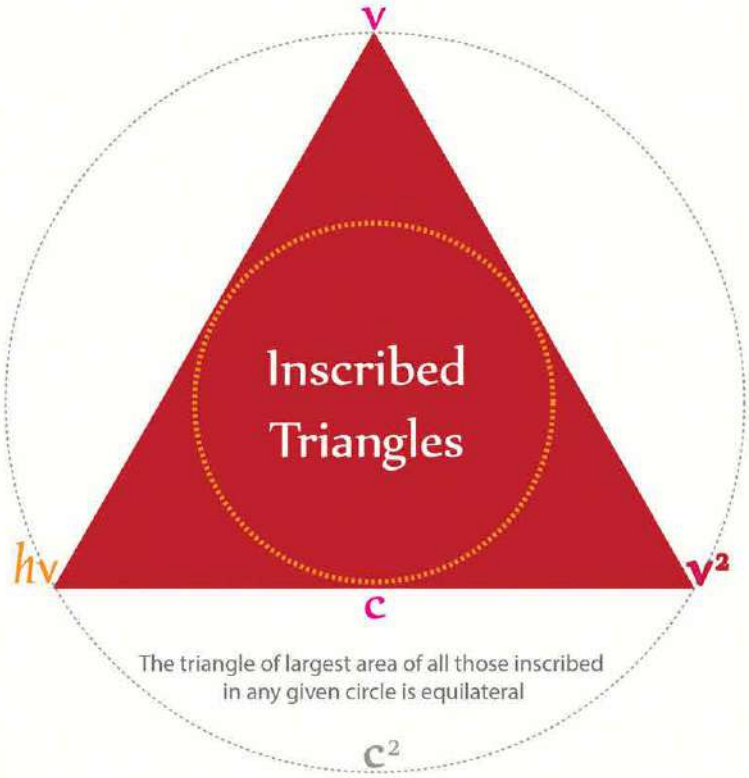
reflect space-time's geometric relationship with charged mass-energy

Energy



QAM





Energy per spatial unit

mass

QAM per spatial unit

seconds

$$m = \frac{E}{c^2}$$

$$\frac{\Omega}{c^2} = s$$

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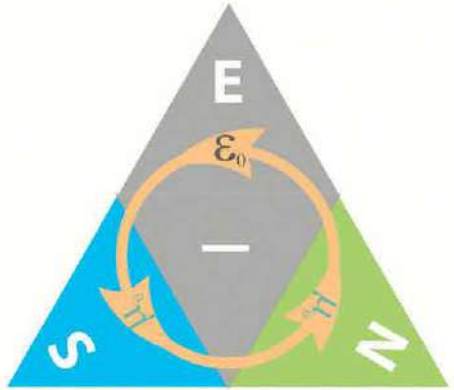
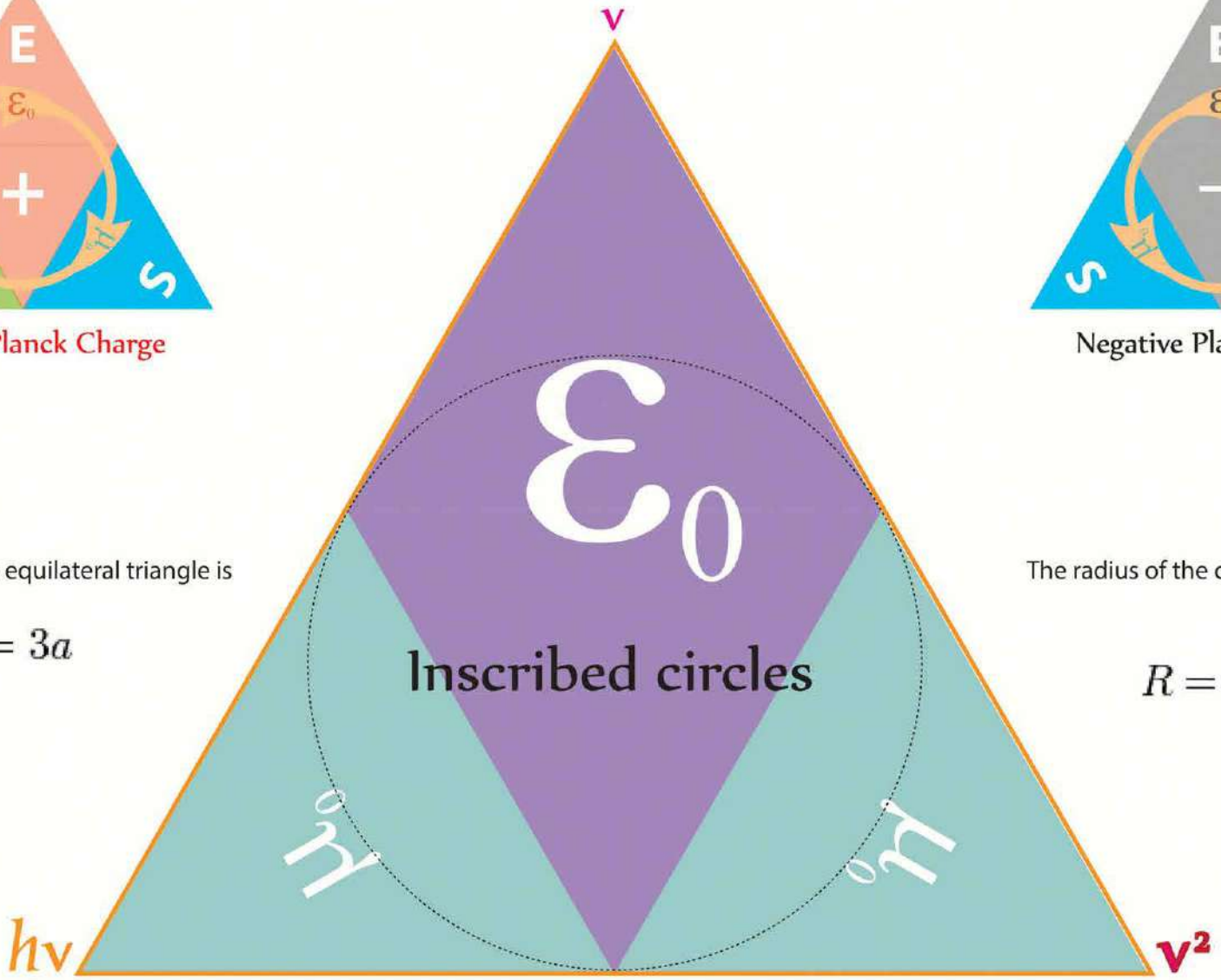
Circumscribed Triangles

reflect Energy's relationship with Time

Positive Planck Charge



Negative Planck Charge



The perimiter of an equilateral triangle is

$$p = 3a$$

The radius of the circumscribed circle is

$$R = \frac{\sqrt{3}}{3}a$$

The equilateral triangle has the smallest area of all those circumscribed around a given circle

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Circumscribed circles

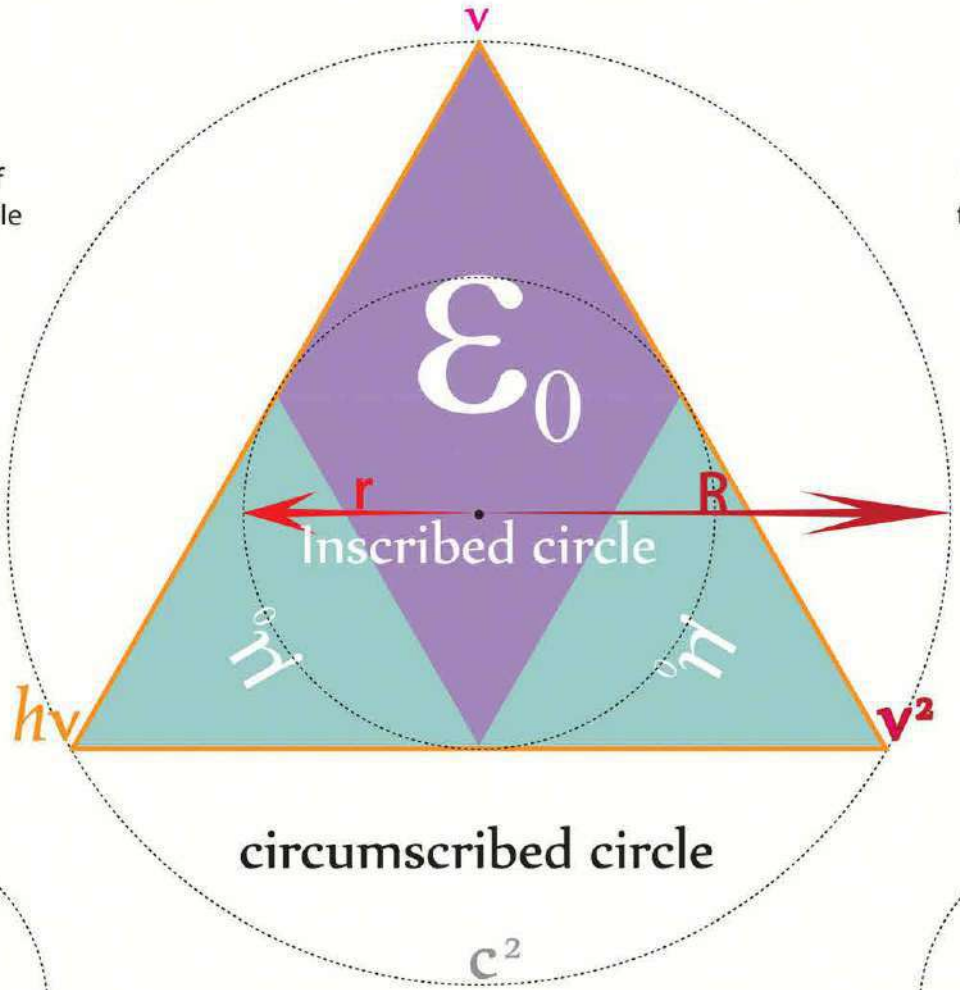
By Euler's inequality, the equilateral triangle has the smallest ratio R/r of the circumradius to the inradius of any triangle: specifically, R/r = 2

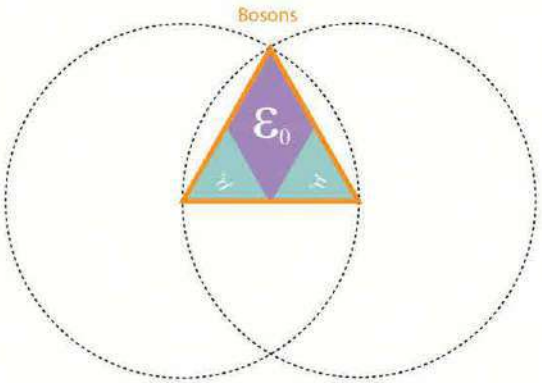
The ratio of the area to the square of the perimeter of an equilateral triangle

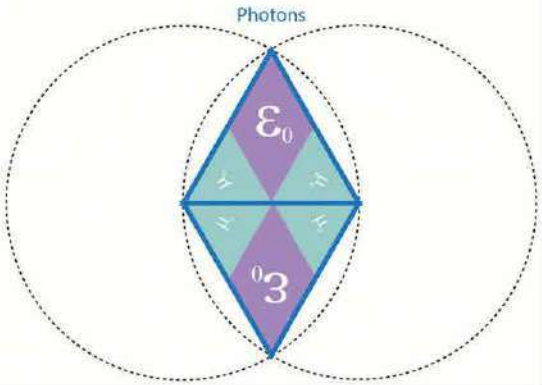
$$\frac{1}{12\sqrt{3}}$$

The ratio of the area of the incircle to the area of an equilateral triangle

$$\frac{\pi}{3\sqrt{3}}$$







Equilateral triangles and Tetrahedrons will scale at exactly the same proportion as Circles and Spheres scribing them

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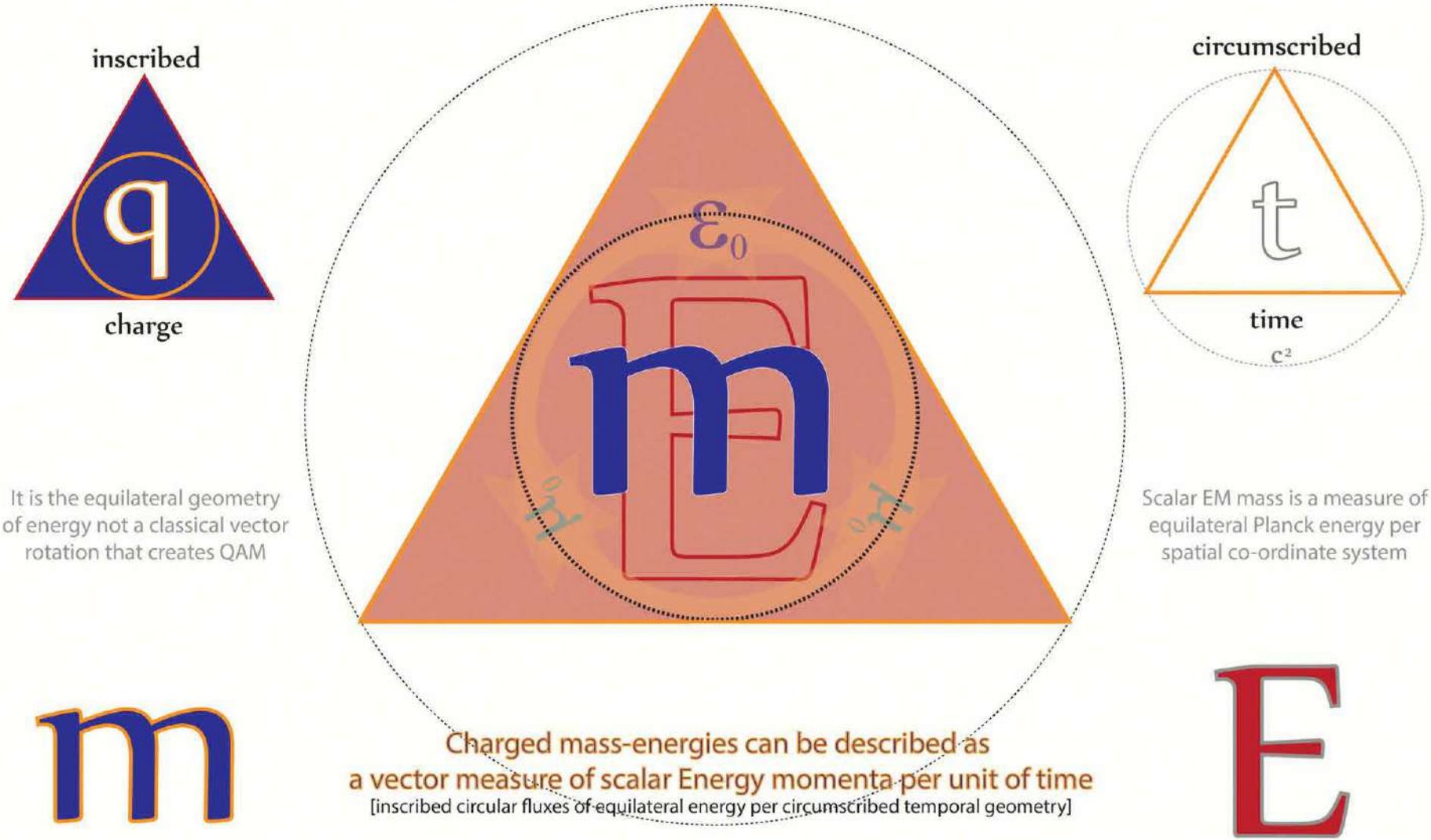
Charged mass-ENERGIES

Charge is the result of quantised angular momenta
[the inscribed circular flux of energy in equilateral geometries]

Time is a measure of changing quantised angular momenta
[the circumscribed spatial co-ordinate of equilateral energy geometries]



Charged mass-energies can be described as a vector measure of scalar Energy momenta per unit of time
[inscribed circular fluxes of equilateral energy per circumscribed temporal geometry]

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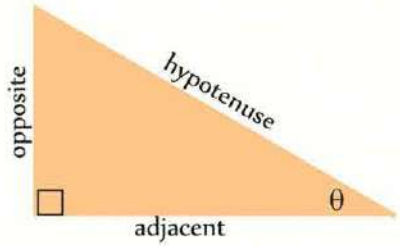
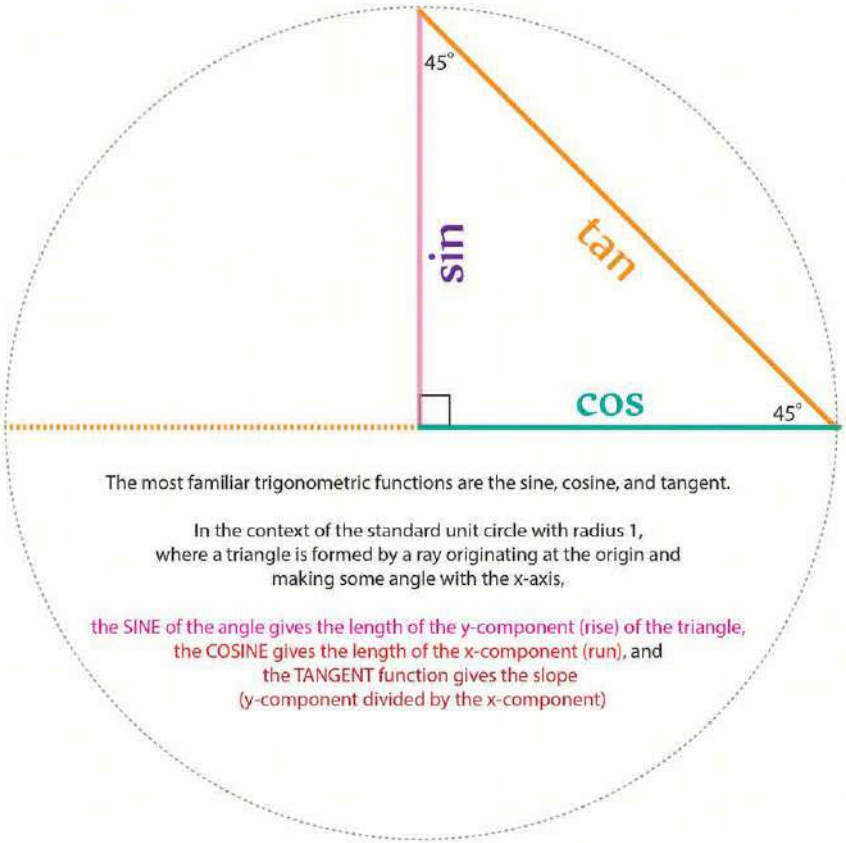
Trigometric functions

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$



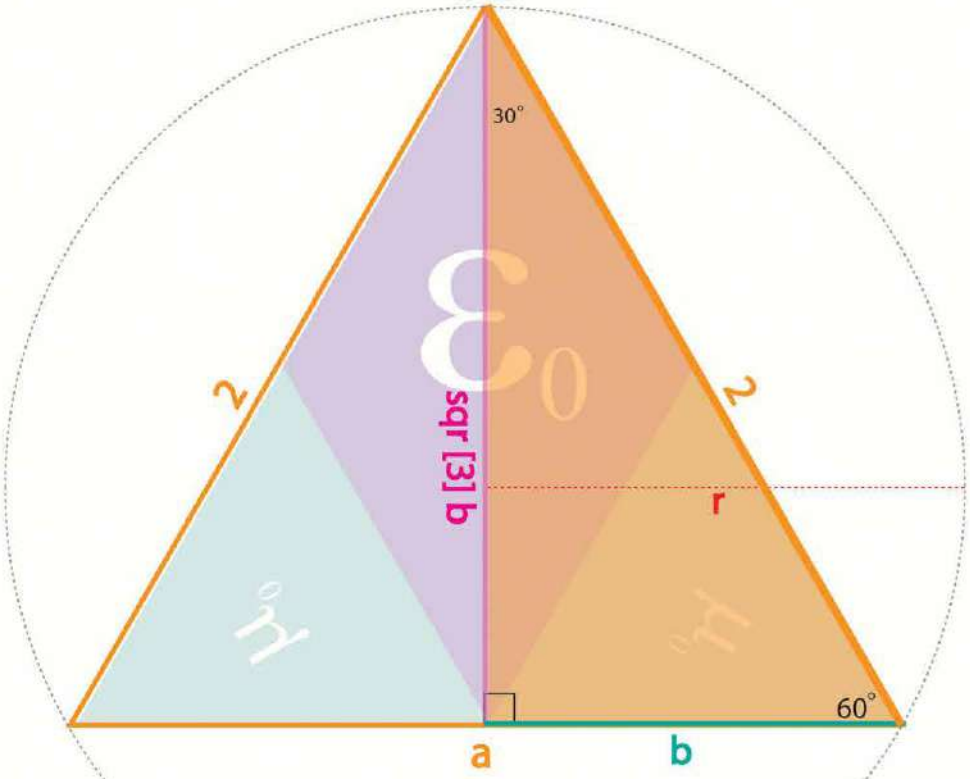


The most familiar trigonometric functions are the sine, cosine, and tangent.

In the context of the standard unit circle with radius 1,
where a triangle is formed by a ray originating at the origin and
making some angle with the x-axis,

the SINE of the angle gives the length of the y-component (rise) of the triangle,
the COSINE gives the length of the x-component (run), and
the TANGENT function gives the slope
(y-component divided by the x-component)

Standard trigometric functions must be carefully applied to measurements of equilateral Planck mass-energy geometries in scribed circular space-time co-ordinate systems



In most cases it is in fact easier to
ignore the trigonomteric functions and math
and simpy draw their related equilateral geometries

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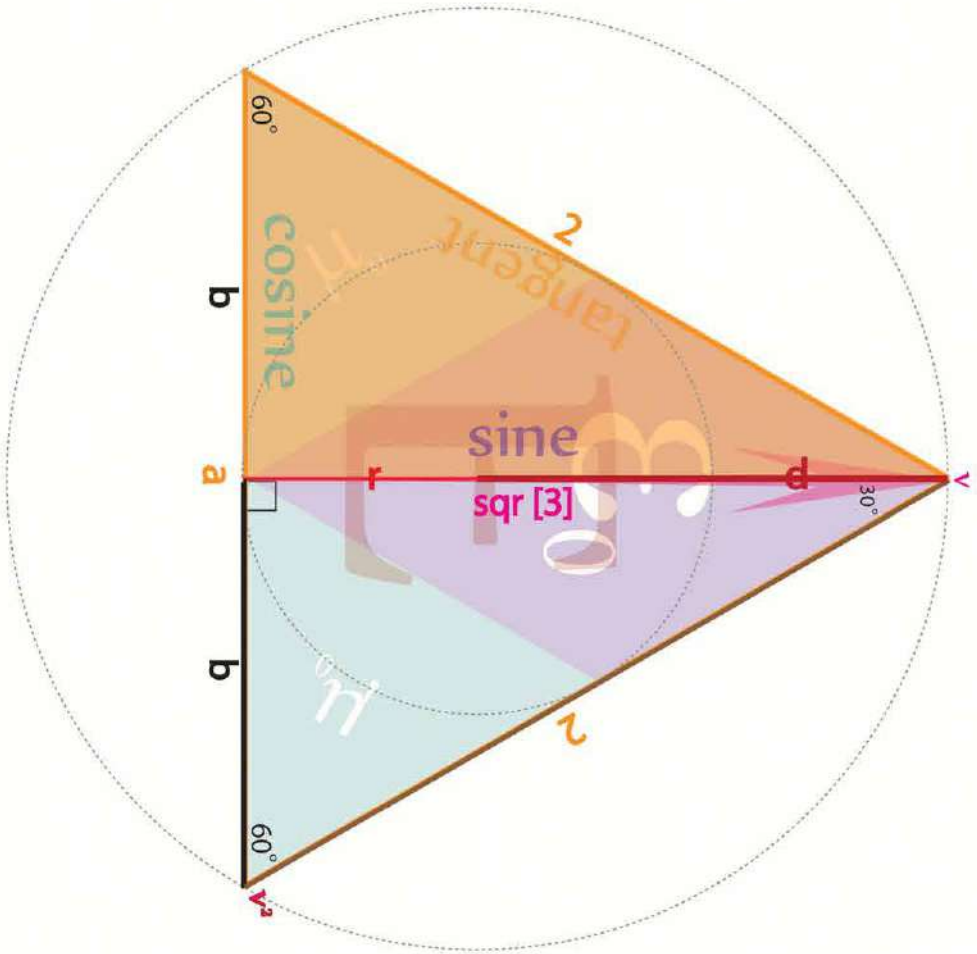
The roots of scribed equilateral triangles

Scalar equilateral energies map directly onto circular space-time co-ordinates
through their square root linear momentum

r

The ratio of the
circumscribed circle of
an equilateral triangle
to its inscribed circle
is 2:1

d



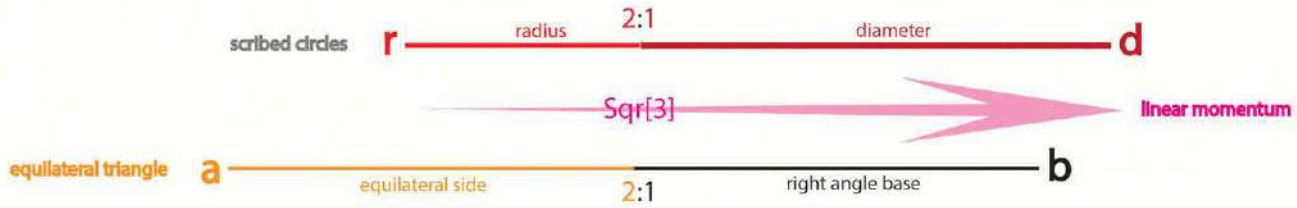
0.866 r

The ratio of the
side of an equilateral triangle
to the radius of
its incribed circle
is sqr [3]/2

a

The ratio of the
side of an equilateral triangle
to the radius of
its circumscribed circle
is sqr [3]

1.732 d



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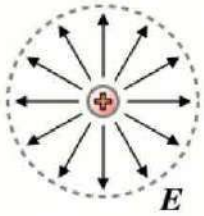
Equilateral triangles and scribed circles

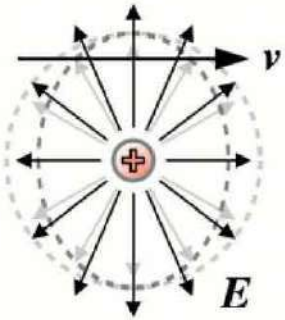
$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}} = \frac{1}{\sqrt{1 - \beta^2}} = \frac{dt}{d\tau}$$

$$\gamma(\beta) = 1 + \frac{1}{2}\beta^2 + \frac{3}{8}\beta^4 + \frac{5}{16}\beta^6 + \frac{35}{128}\beta^8 + \dots$$

$$L = L'\sqrt{1 - \frac{v^2}{c^2}}$$

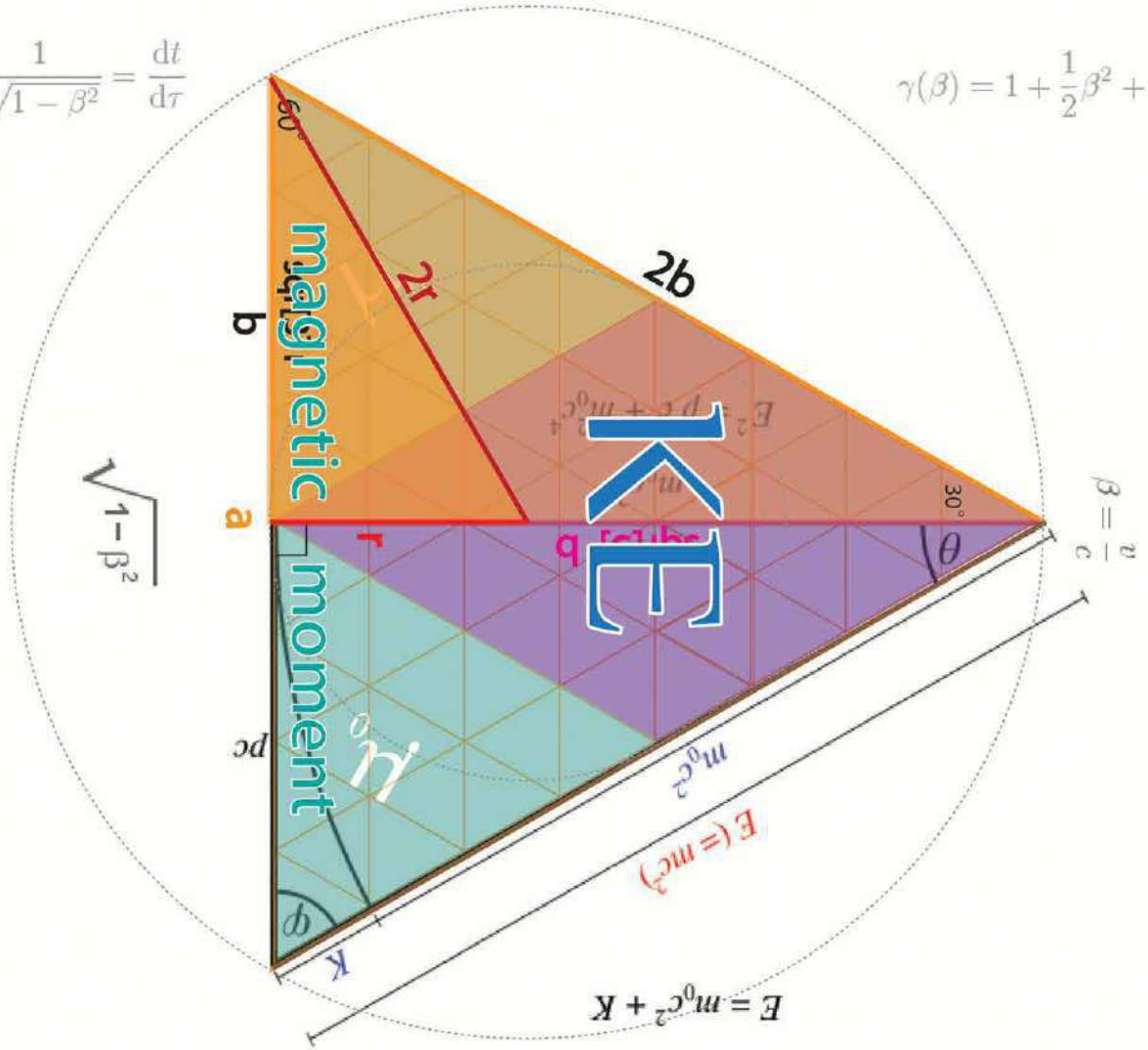
$$E_k = \frac{mc^2}{\sqrt{1 - (v/c)^2}} - mc^2$$





$$mc^2\left\{\frac{1}{\sqrt{1 - v^2/c^2}} - 1\right\}$$

$$p = \frac{m_0 v}{\sqrt{1 - \frac{v^2}{c^2}}} = \gamma m_0 v$$



$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\sqrt{1 - \left(\frac{v}{c}\right)^2}$$

All the relativistic relationships historically attributed to circularised energies and modelled through the use of the math of right angled triangles are in fact the result of equilateral, scalar geometries

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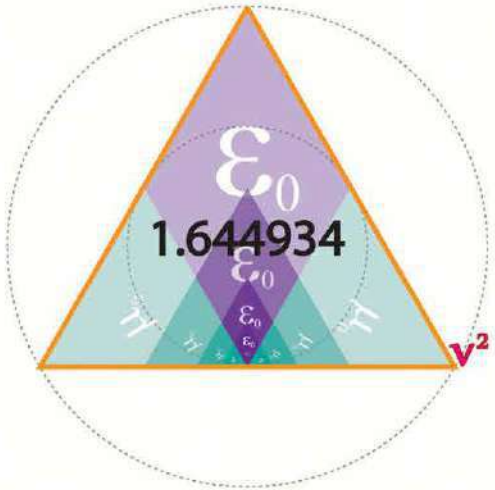
Finite sequences and series have defined first and last terms,

$$\sum a_n = a_0 + a_1 + a_2$$



$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \lim_{n \to +\infty} \left(\frac{1}{1^2} + \frac{1}{2^2} + \cdots + \frac{1}{n^2} \right).$$

whereas infinite sequences and series continue indefinitely

The Basel problem is a famous problem in mathematical analysis with relevance to number theory, first posed by Pietro Mengoli in 1644 and solved by Leonhard Euler in 1735.

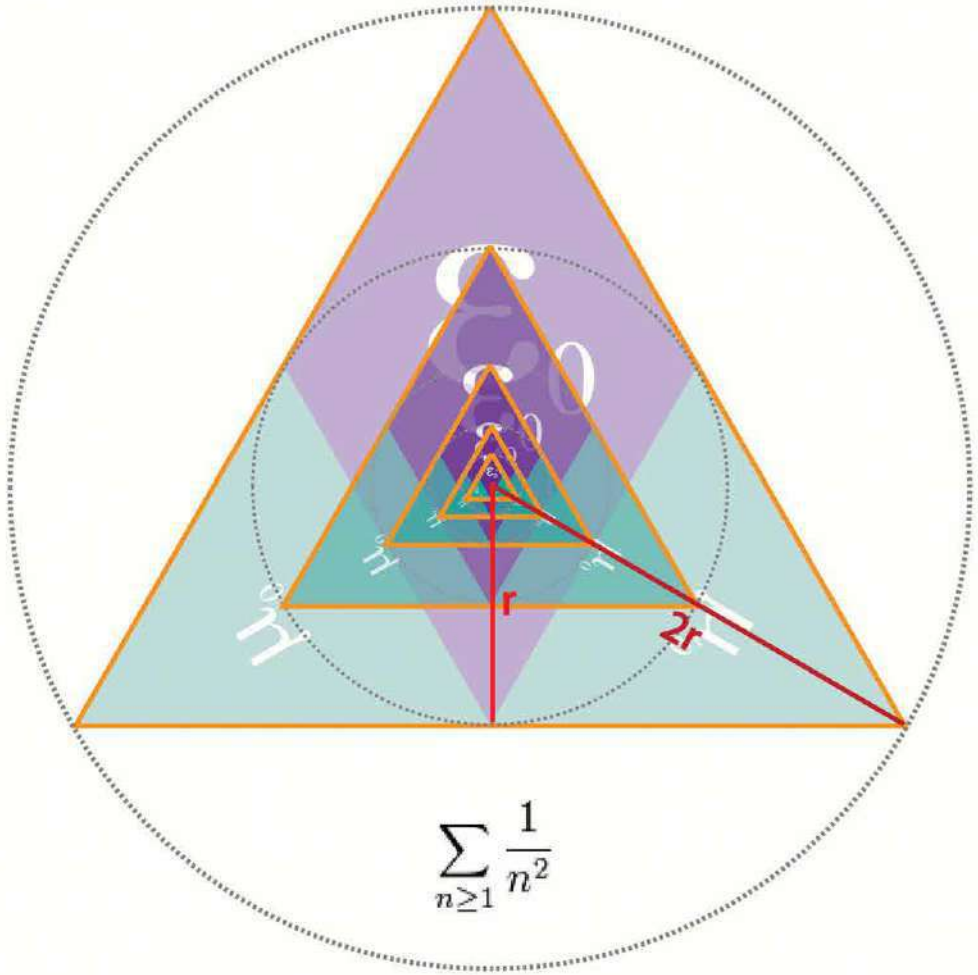
$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \ldots = \frac{\pi^2}{6}$$

Tetryonics now provides a geometric solution to visualising and solving the Basel problem

$$\zeta(2) = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \cdots = \frac{\pi^2}{6} \approx 1.645;$$

Tetryonic Infinite Series

is a infinite sequence of square numbers,
the result of adding all those terms together
[or their geometric inverse]



$$\sum_{n \geq 1} \frac{1}{n^2}$$

The entire sum of the series is equal to
twice the size of the radius of the largest inscribed circle
which is equal to the largest circle circumscribing the triangular series.

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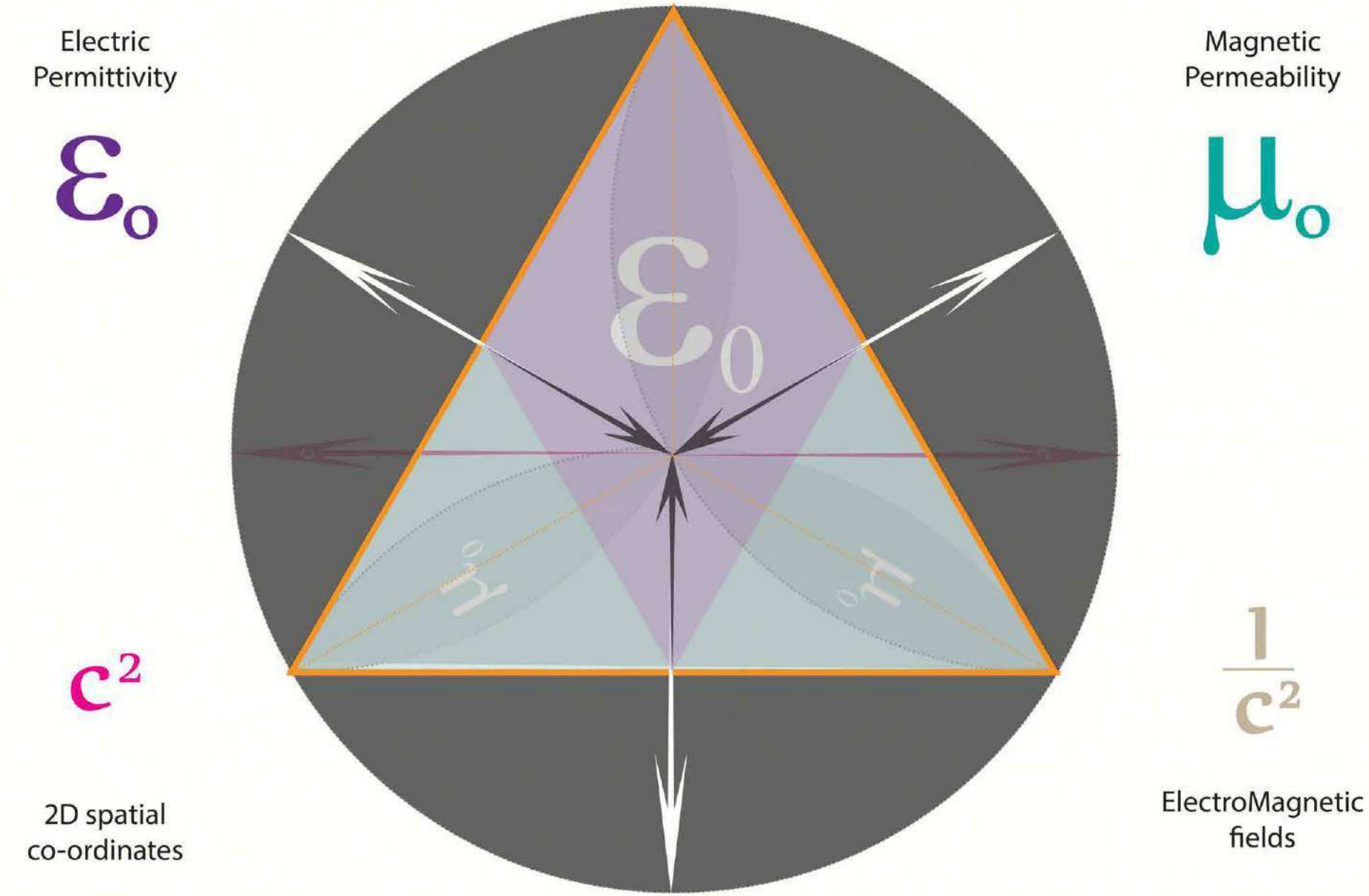
Inverting the Circle



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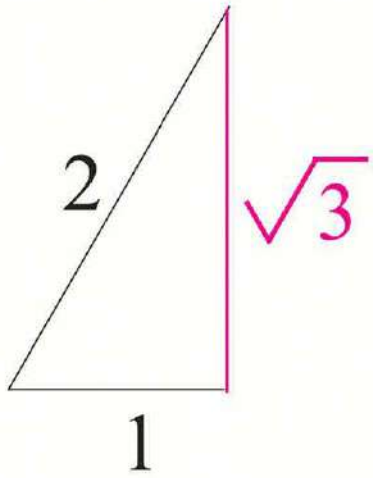
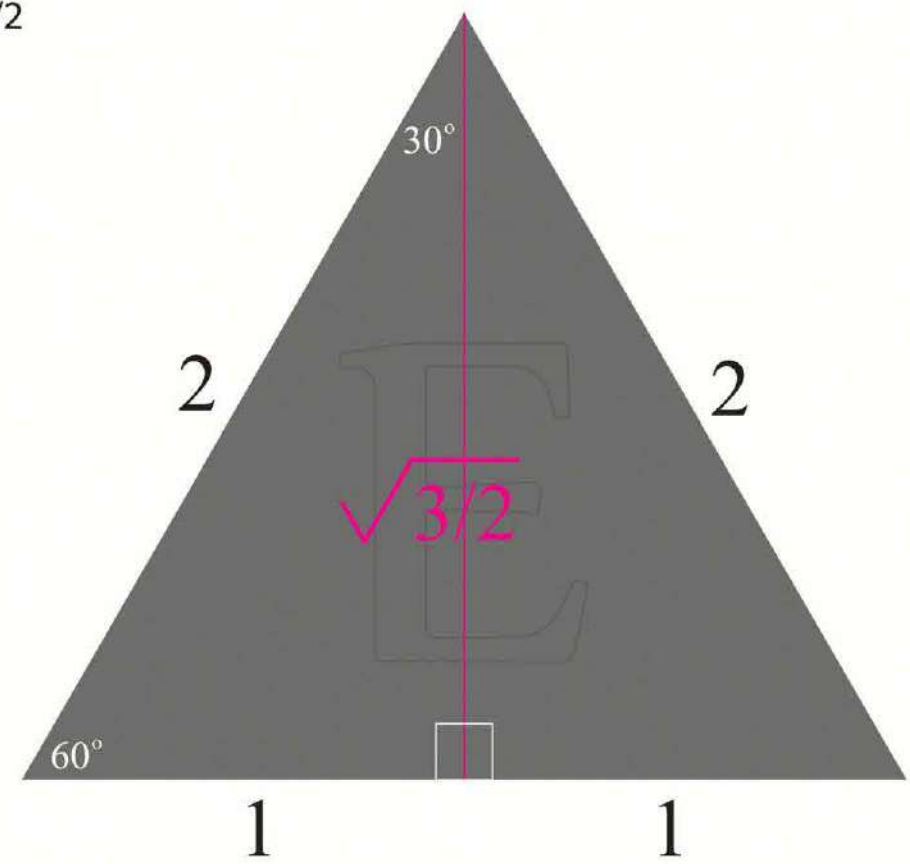
Irrational numbers

an irrational number cannot be represented as a simple fraction.
Irrational numbers are those real numbers that cannot be represented as terminating or repeating decimals

sin(x)=-square root of (3)/2





0.866025403.....

Pythagφras' theoreom
and irratiφnal numbers expressed in terms of right-angled triangles in Physics
offer a 'half truth' regarding the equilateral geometry of Energy

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Leibniz

Leibniz introduced the concept of vis viva (living force) which attempted to quantify life force

$E=mv^2$

Newton

linear momentum

v

Newton focused his work on linear momentum which he developed into his famous laws of motion

Newton and Leibniz disagreed about what the world is made of and how its physics shaped our scientific concepts of force, energy, and momentum

Tetryonics reveals the physical relationships they both described mathematically as geometric properties of equilateral Planck energy momenta

$p=mv$

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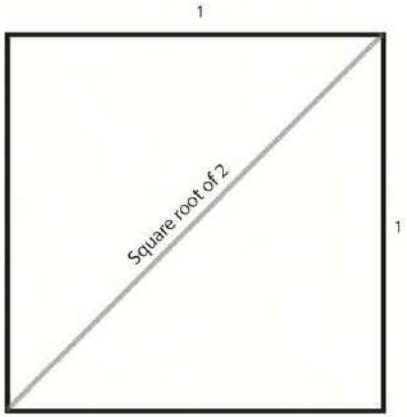
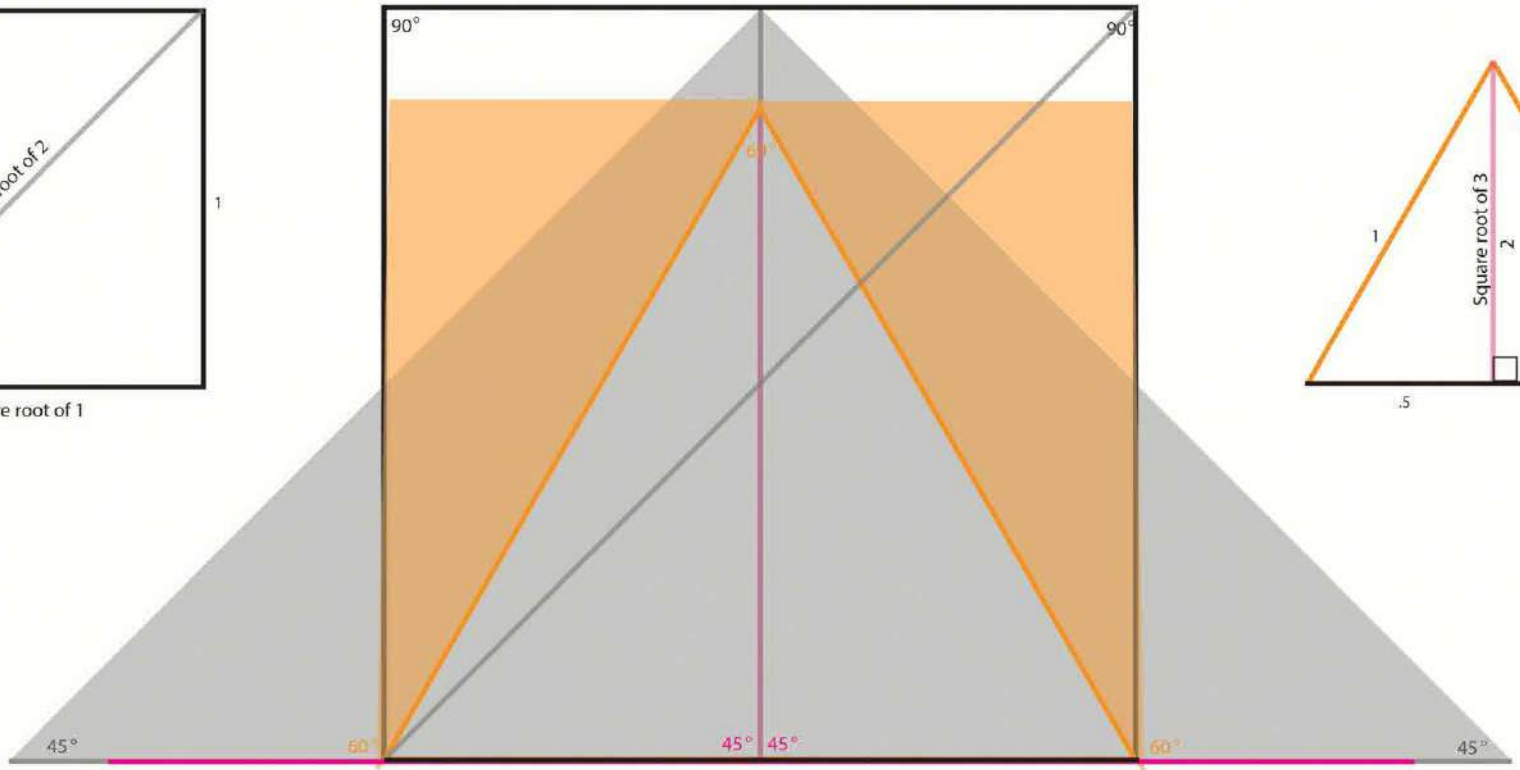
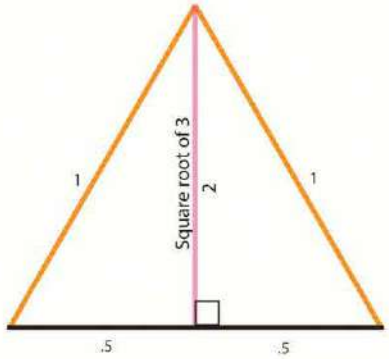
Geometric Square Roots

In geometrical terms, the square root function maps the area of a square to its side length.



Square root of 1





"In mathematics, as in any scientific research, we find two tendencies present. On the one hand, the tendency toward abstraction seeks to crystallize the logical relations inherent in the maze of material that is being studied, and to correlate the material in a systematic and orderly manner. On the other hand, the tendency toward intuitive understanding fosters a more immediate grasp of the objects one studies, a live rapport with them, so to speak, which stresses the concrete meaning of their relations"

Square root of 1

Square root of 2

Square root of 3

"As to geometry, in particular, the abstract tendency has here led to the magnificent systematic theories of Algebraic Geometry, of Riemannian Geometry, and of Topology; these theories make extensive use of abstract reasoning and symbolic calculation in the sense of algebra.

Notwithstanding this, it is still as true today as it ever was that intuitive understanding plays a major role in geometry. And such concrete intuition is of great value not only for the research worker, but also for anyone who wishes to study and appreciate the results of research in geometry"

David Hilbert [Geometry and the Imagination]

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Square Roots in Physics

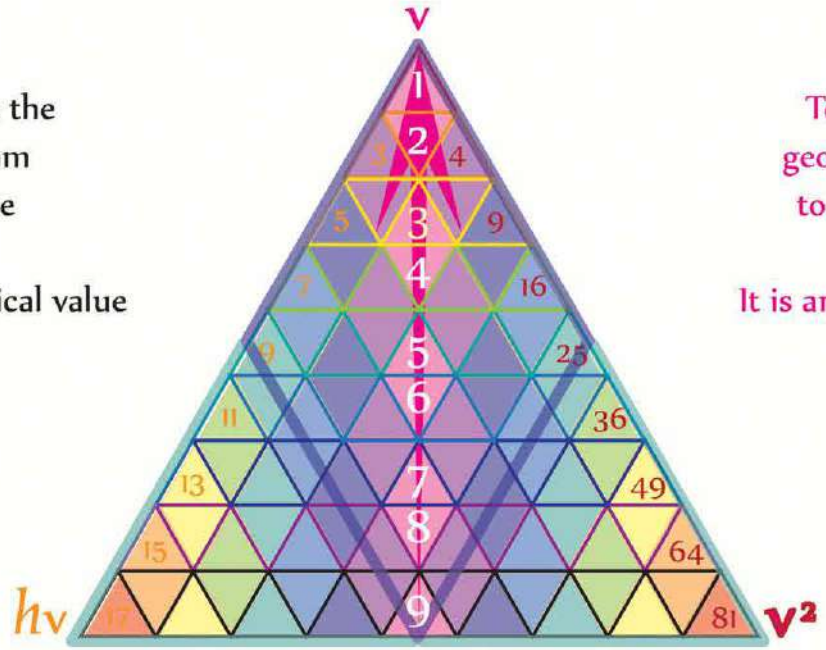
In mathematics, a square root of a number a is a number [n] such that [n]2 = x,
or, in other words, a number [n] whose square (the result of multiplying the number by itself, or [n × n]) is x.

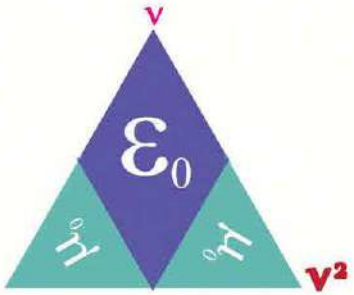
Modern calculators use the
Square Root Algorithm
to calculate the value

It is an approximate numerical value

Tetryonics uses the
geometric Square Root
to calculate the value

It is an exact geometric value

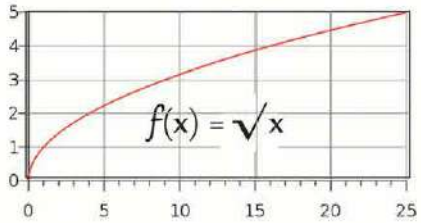




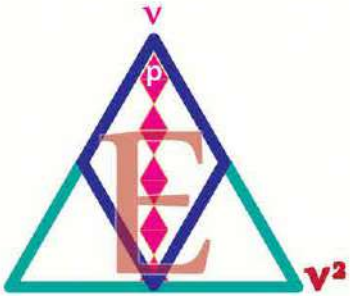
$$E = mv^2$$

In classical geometry,
the square root function maps the
area of a square to its side length.

$$p = \sqrt{E}$$



Geometry can easily map irrational numbers



$$p^2 = E$$

In physics,
the square root function maps
ENERGY [E] to momentum [mv]

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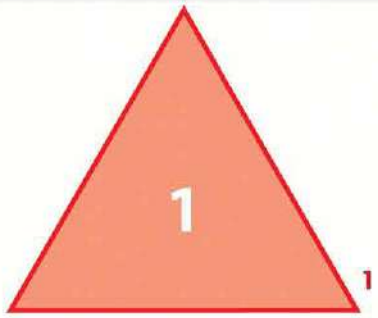
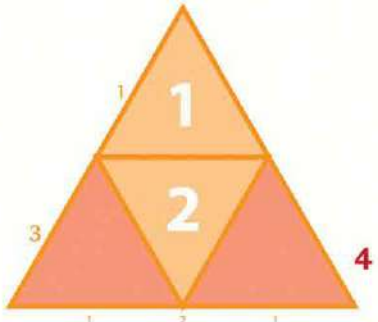
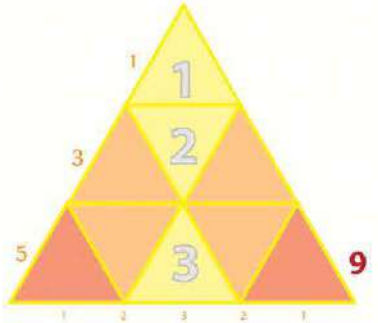
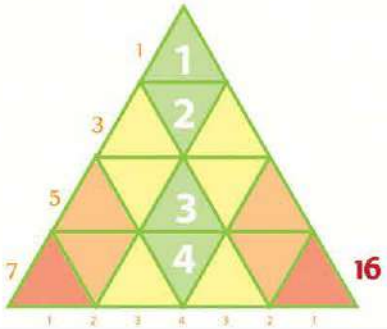
The Square roots of n

Historically, any number raised to the power of 2 has been modeled using a polygon--the square
That's why we call raising a number to the second power "squaring the number."



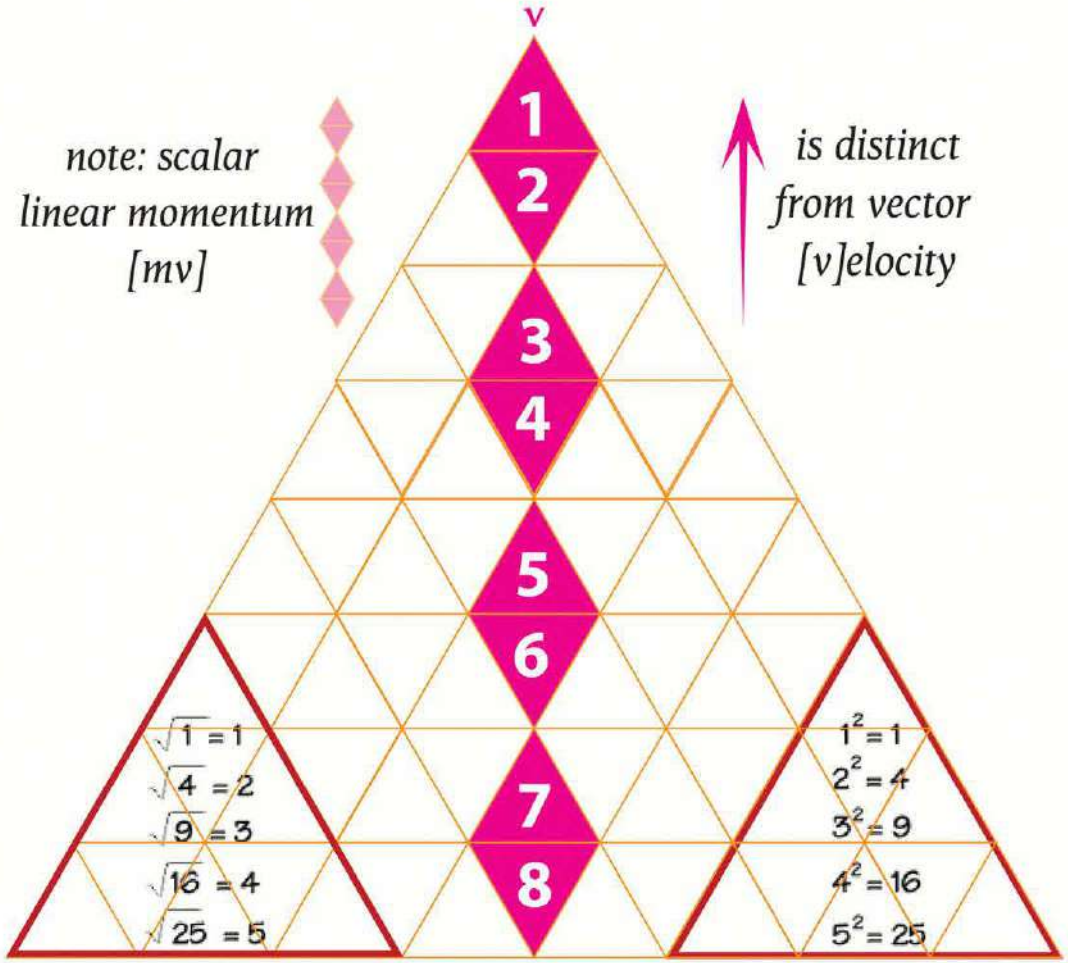




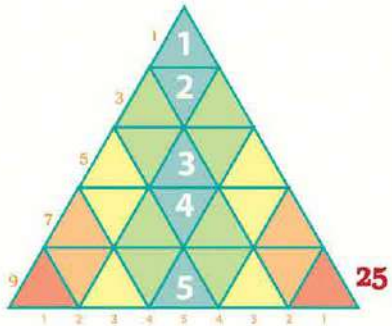


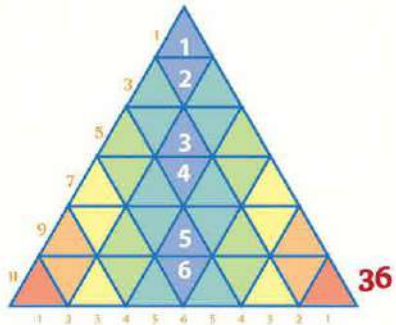
note: scalar linear momentum [mv]

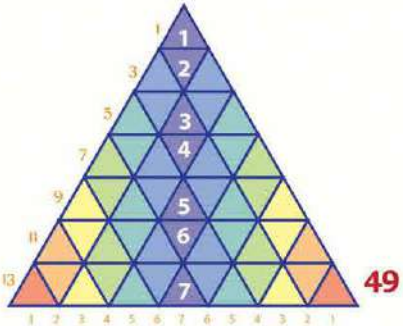
is distinct from vector [v]elocity

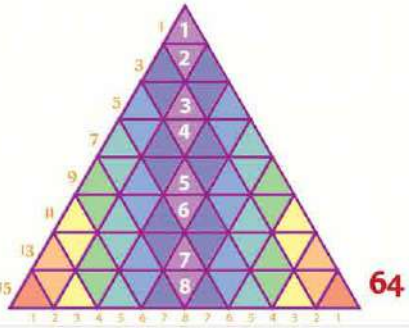


[In physics square numbers are in fact equilateral geometries]
The perfect squares are squares of whole numbers.
Here are the first eight perfect squares









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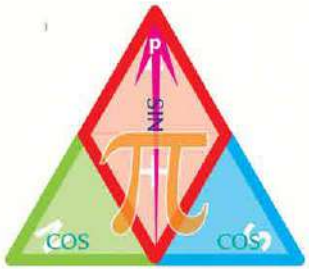
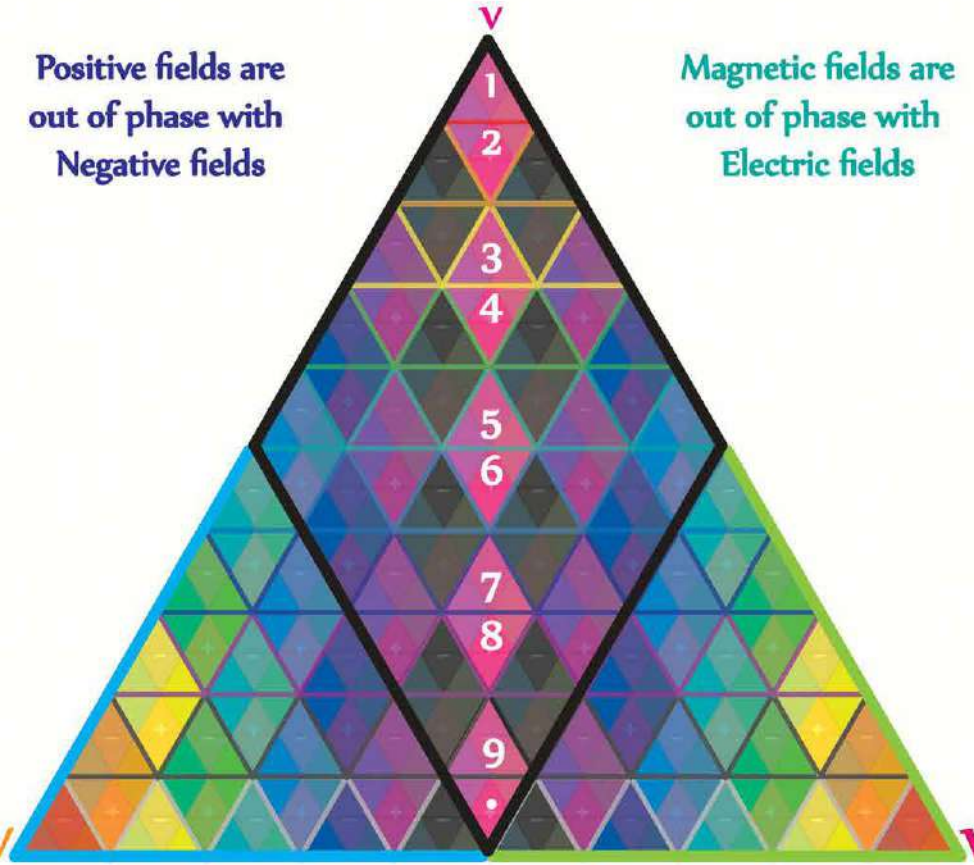
The Square root of Negative 1



Positive fields are out of phase with Negative fields



Magnetic fields are out of phase with Electric fields

Euler's Formula

Euler's formula is often considered to be the basis of the complex number system. In deriving this formula, Euler established a relationship between the trigonometric functions, sine and cosine, and e raised to a power

$$e^{ix} = \cos(x) + i\sin(x)$$

a mathematical description of EM-Energy waveforms

Leonhard Euler

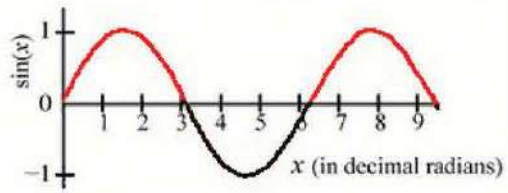
(15 April 1707 – 18 September 1783)

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots$$

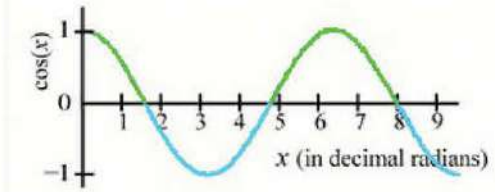
$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \dots$$

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$

$$\sin x + \cos x = 1 + x - \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \dots$$



$$e^{i\pi} = -1 \qquad e^{i\pi} + 1 = 0$$



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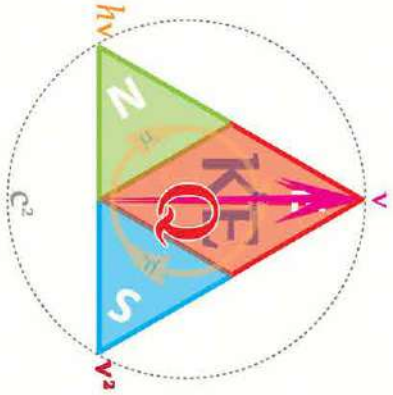
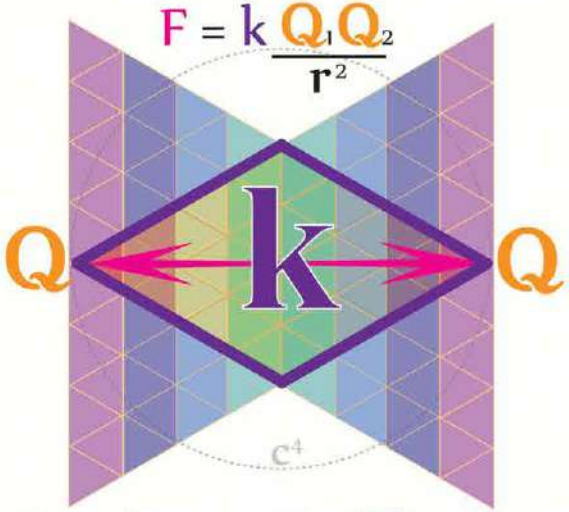
Geometric means

The geometric mean of two numbers, is the square root of their product

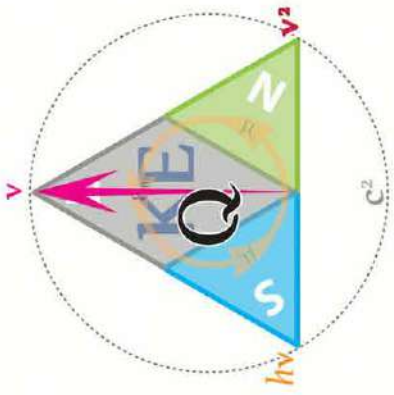
geometric square root of positive one



$$F = k \frac{Q_1 Q_2}{r^2}$$

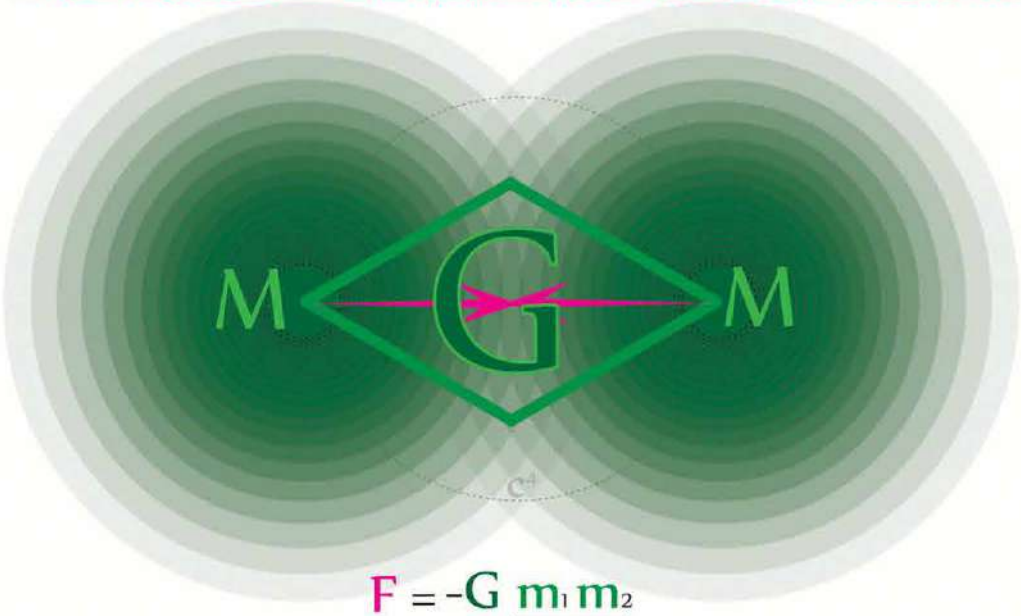


geometric square root of negative one



In physics, the geometric mean of two superpositioned fields produces a vector square root Force

It is generally stated that the geometric mean applies only to positive numbers.



$$F = -G \frac{m_1 m_2}{r^2}$$

In Tetryonic geometry the geometric mean applies to positive & negative fields.

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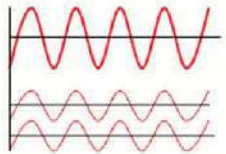
Superpositioning

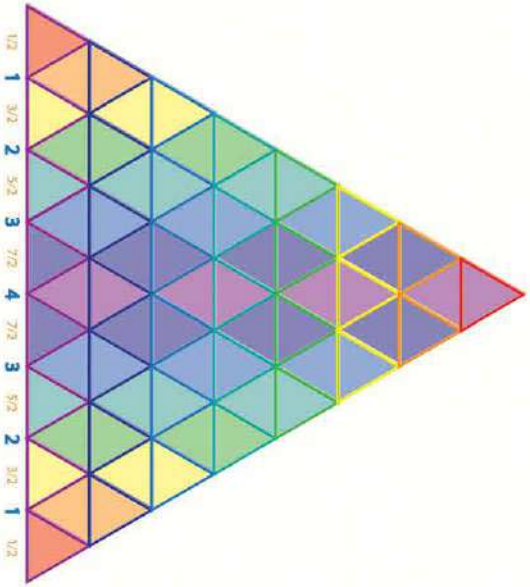
When two or more waves traverse the same space,
the net amplitude at each point is the
sum of the amplitudes of the individual waves.

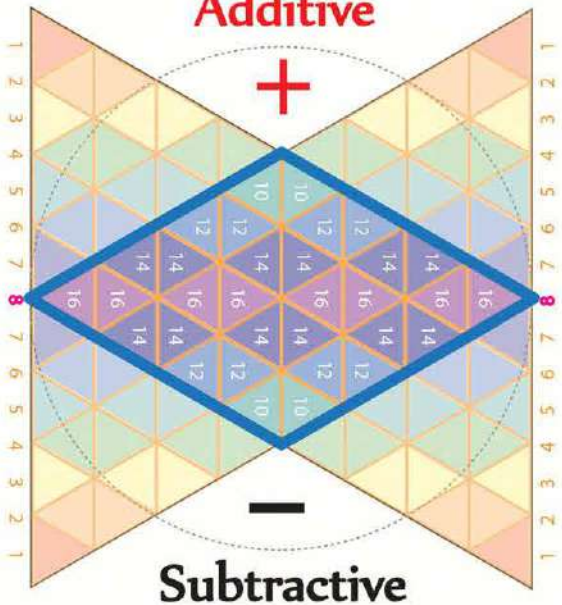


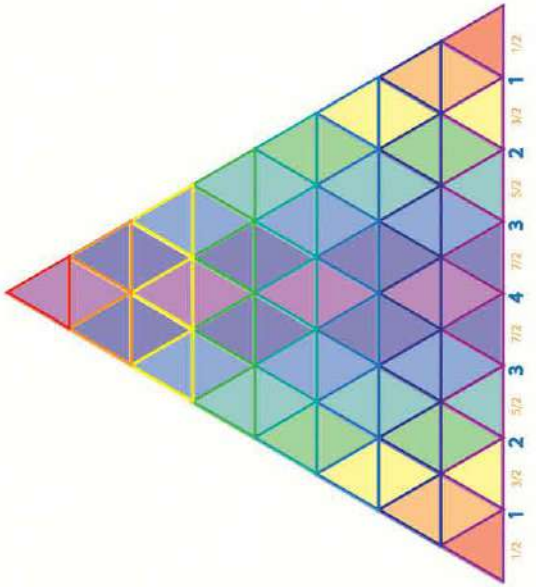
constructive interference

In phase

Additive

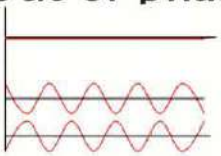






Subtractive

Out of phase



destructive interference

When two or more waves traverse the same space,
if the summed variation has a smaller amplitude
than the constiuent component variations.

The lines of Force

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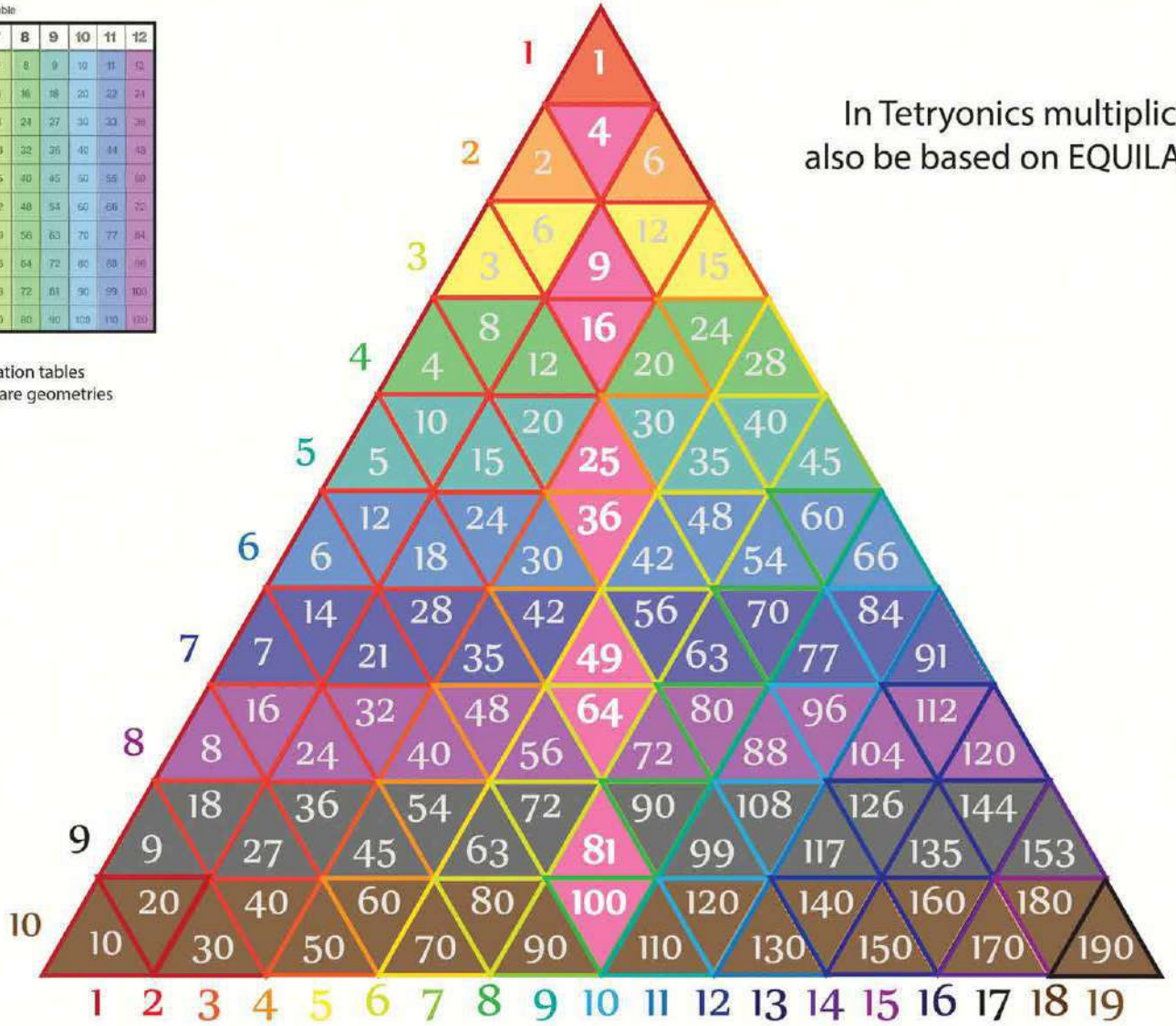
Tetryonic Multiplication table

A multiplication table is a mathematical grid used to define a multiplication operation and its results

Multiplication Table

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120

Historically Multiplication tables have been based on Square geometries



In Tetryonics multiplication tables can also be based on EQUILATERAL geometries

The integer multiplicitors are colour coded

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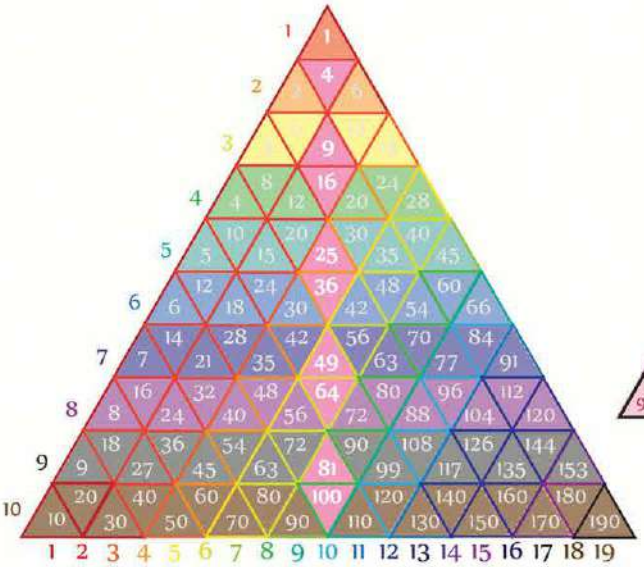
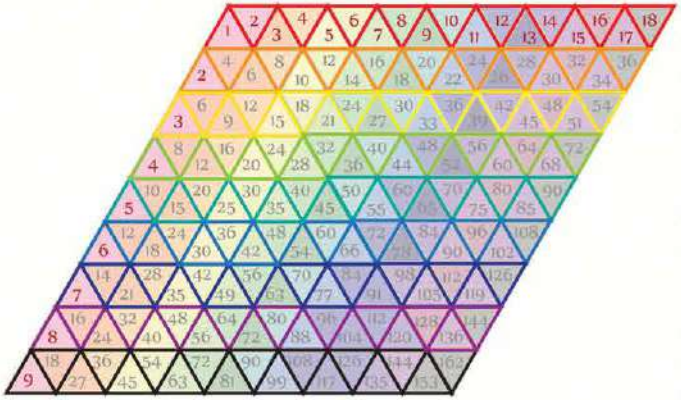
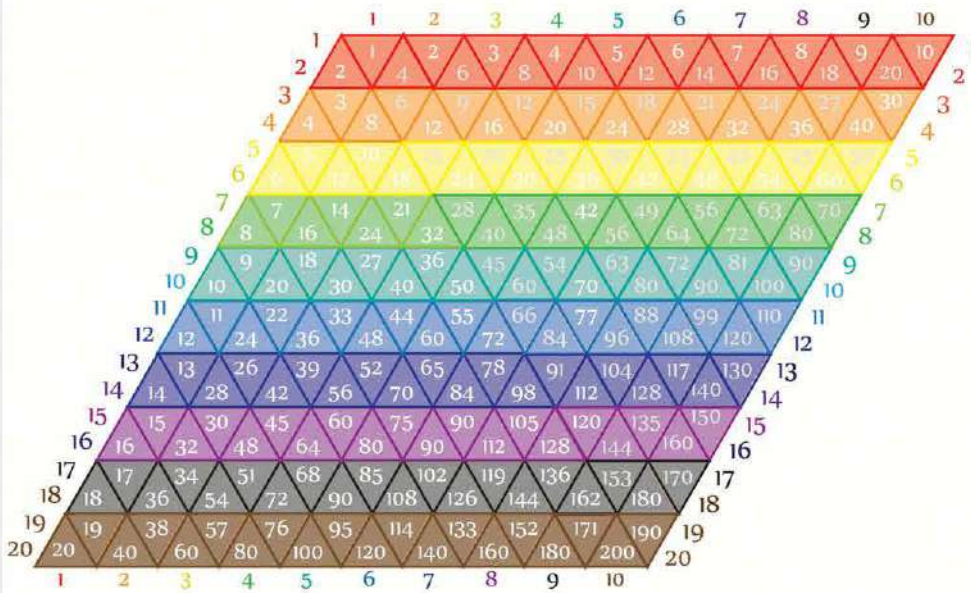
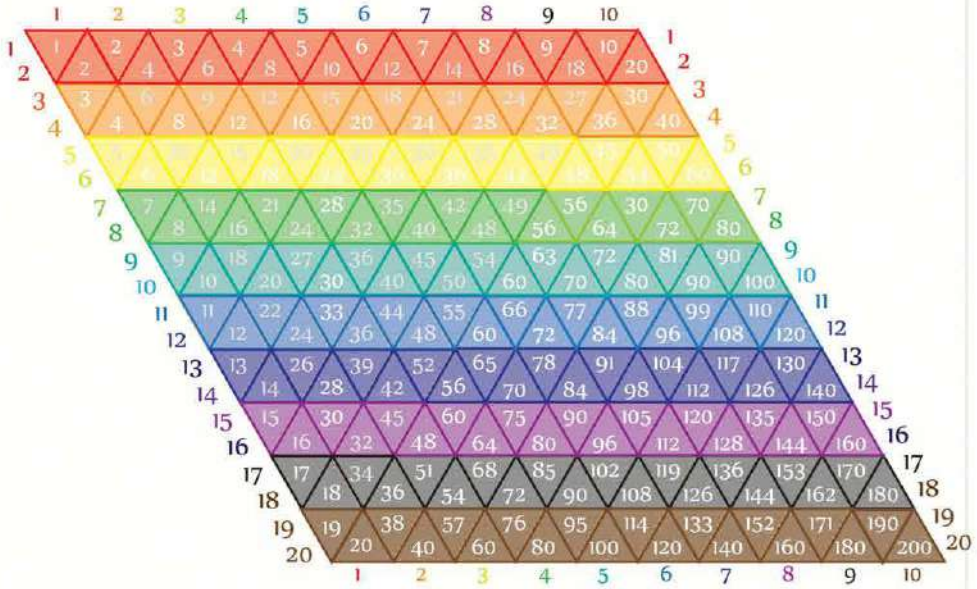
Rhombic Multiplication Tables

1	2	3	4	5	6	7	8	9	10
2	**4**	6	8	10	12	14	16	18	20
3	6	**9**	12	15	18	21	24	27	30
4	8	12	**16**	20	24	28	32	36	40
5	10	15	20	**25**	30	35	40	45	50
6	12	18	24	30	**36**	42	48	54	60
7	14	21	28	35	42	**49**	56	63	70
8	16	24	32	40	48	56	**64**	72	80
9	18	27	36	45	54	63	72	**81**	90
10	20	30	40	50	60	70	80	90	**100**









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Photonic Root Tables

Tetryonic multiplication table can take a number of geometric forms

Square root median

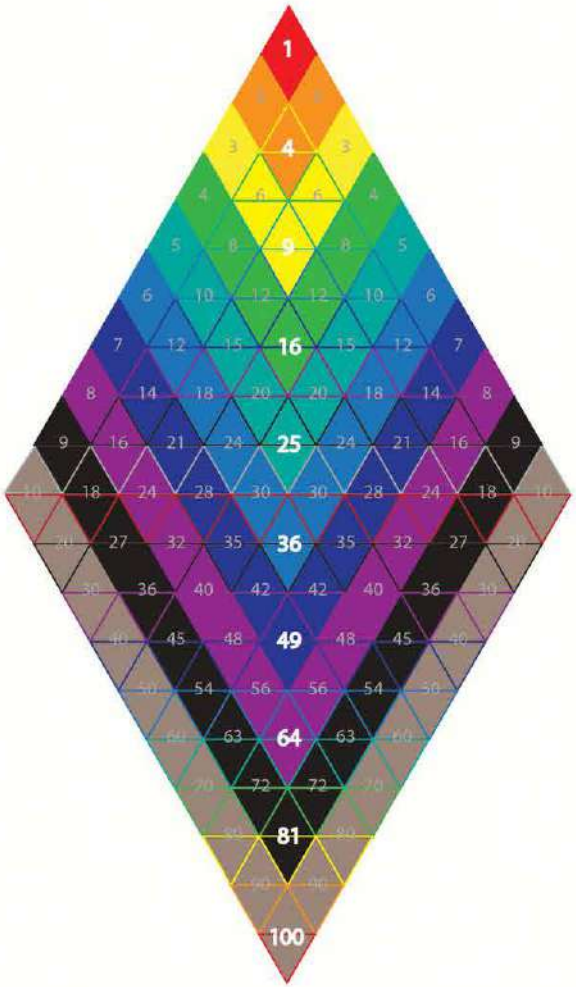
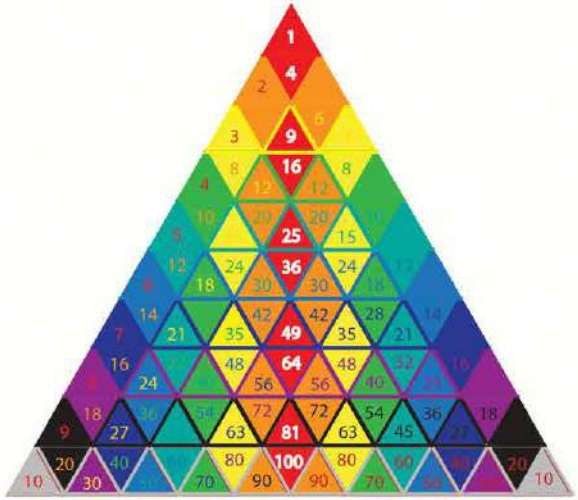


Table read diagonally



1	2	3	4	5	6	7	8	9	10
2	**4**	6	8	10	12	14	16	18	20
3	6	**9**	12	15	18	21	24	27	30
4	8	12	**16**	20	24	28	32	36	40
5	10	15	20	**25**	30	35	40	45	50
6	12	18	24	30	**36**	42	48	54	60
7	14	21	28	35	42	**49**	56	63	70
8	16	24	32	40	48	56	**64**	72	80
9	18	27	36	45	54	63	72	**81**	90
10	20	30	40	50	60	70	80	90	**100**

Integer median

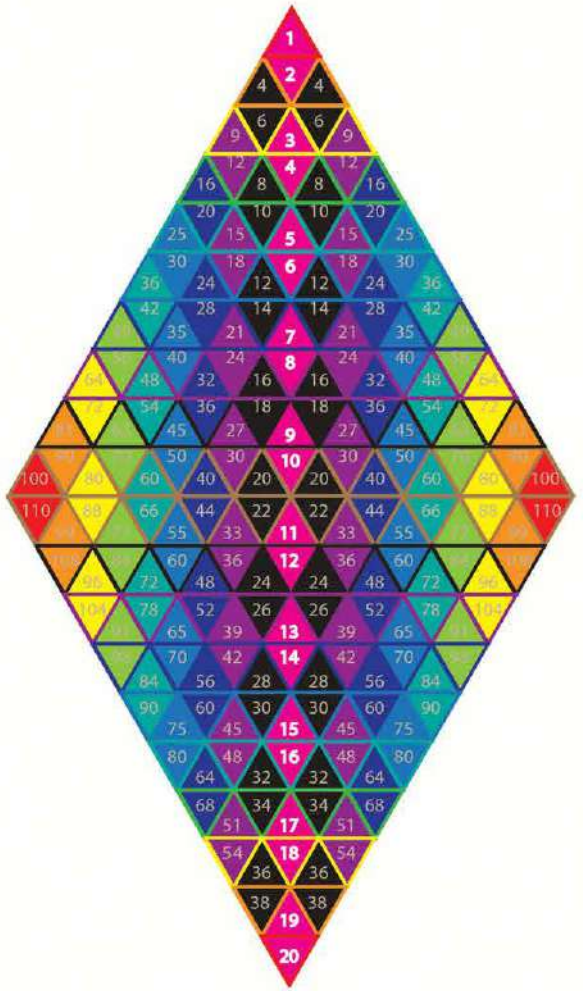


Table read from centre
to outside edge then down

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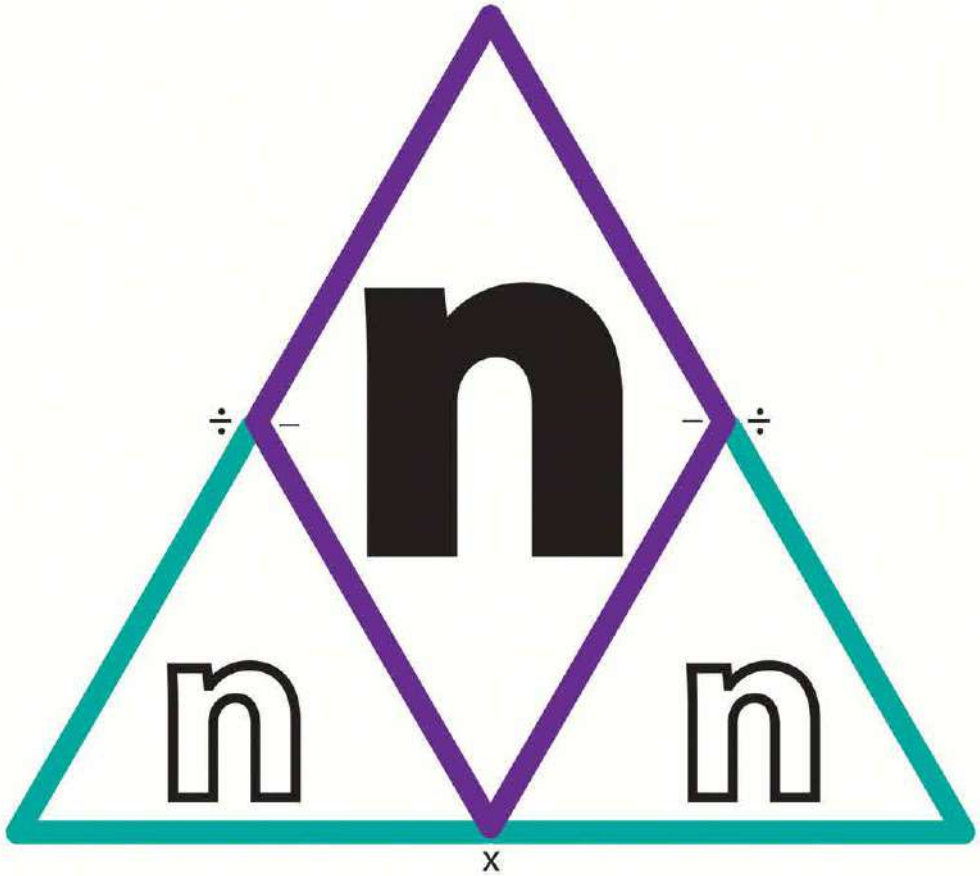
Divide [division] tables

Minus [subtraction] tables



Times [multiplication] tables

Plus [addition] tables

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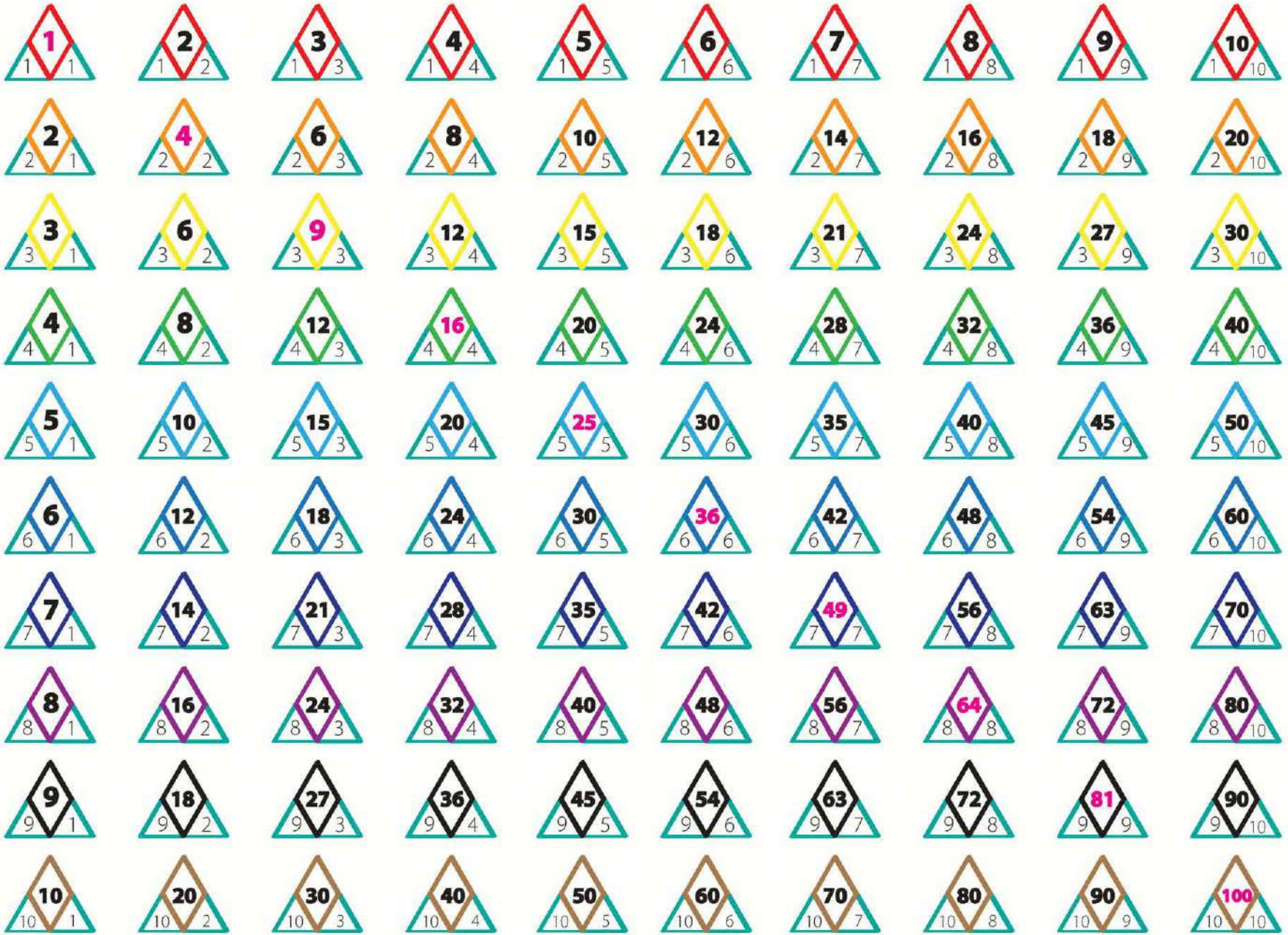

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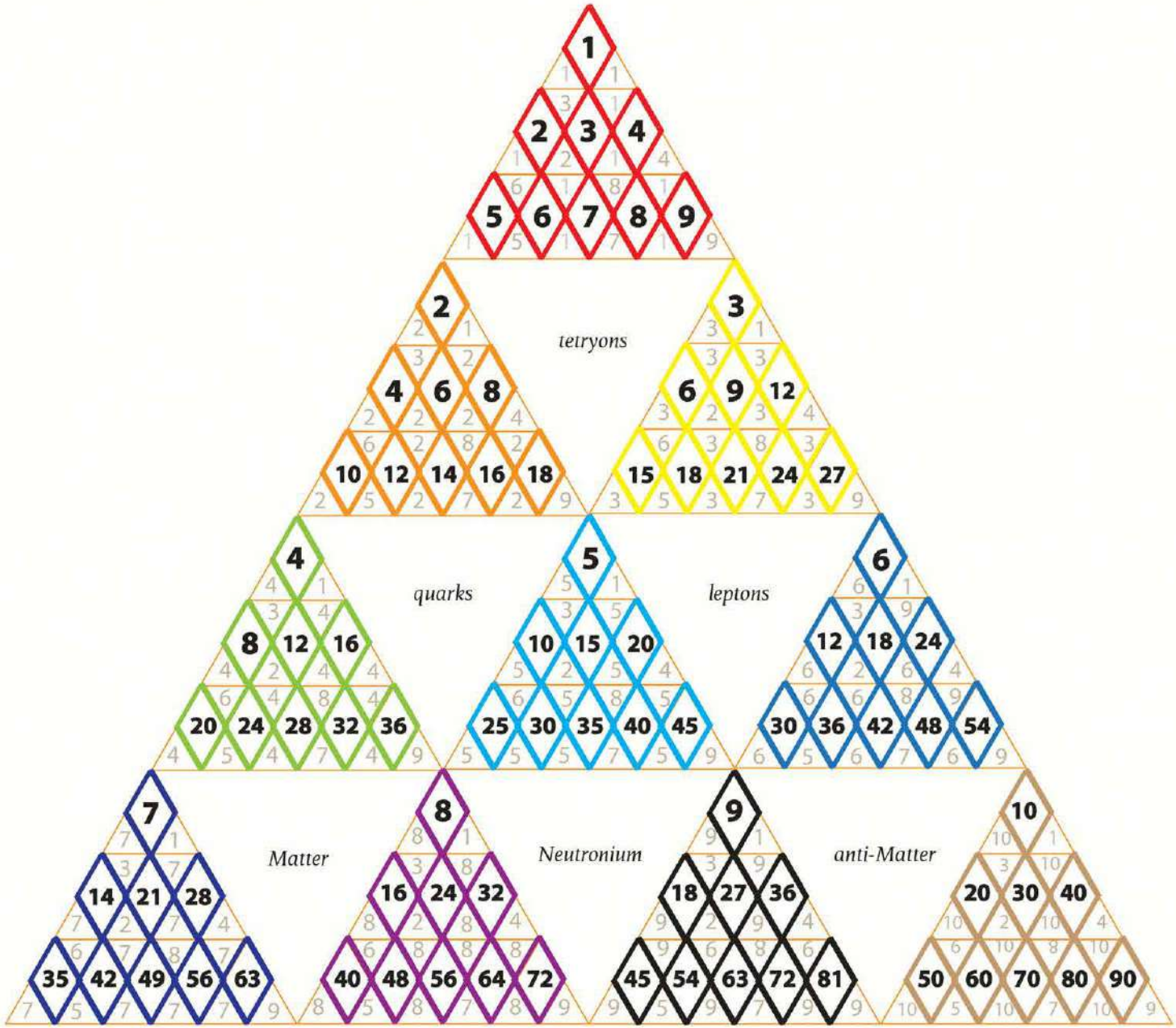

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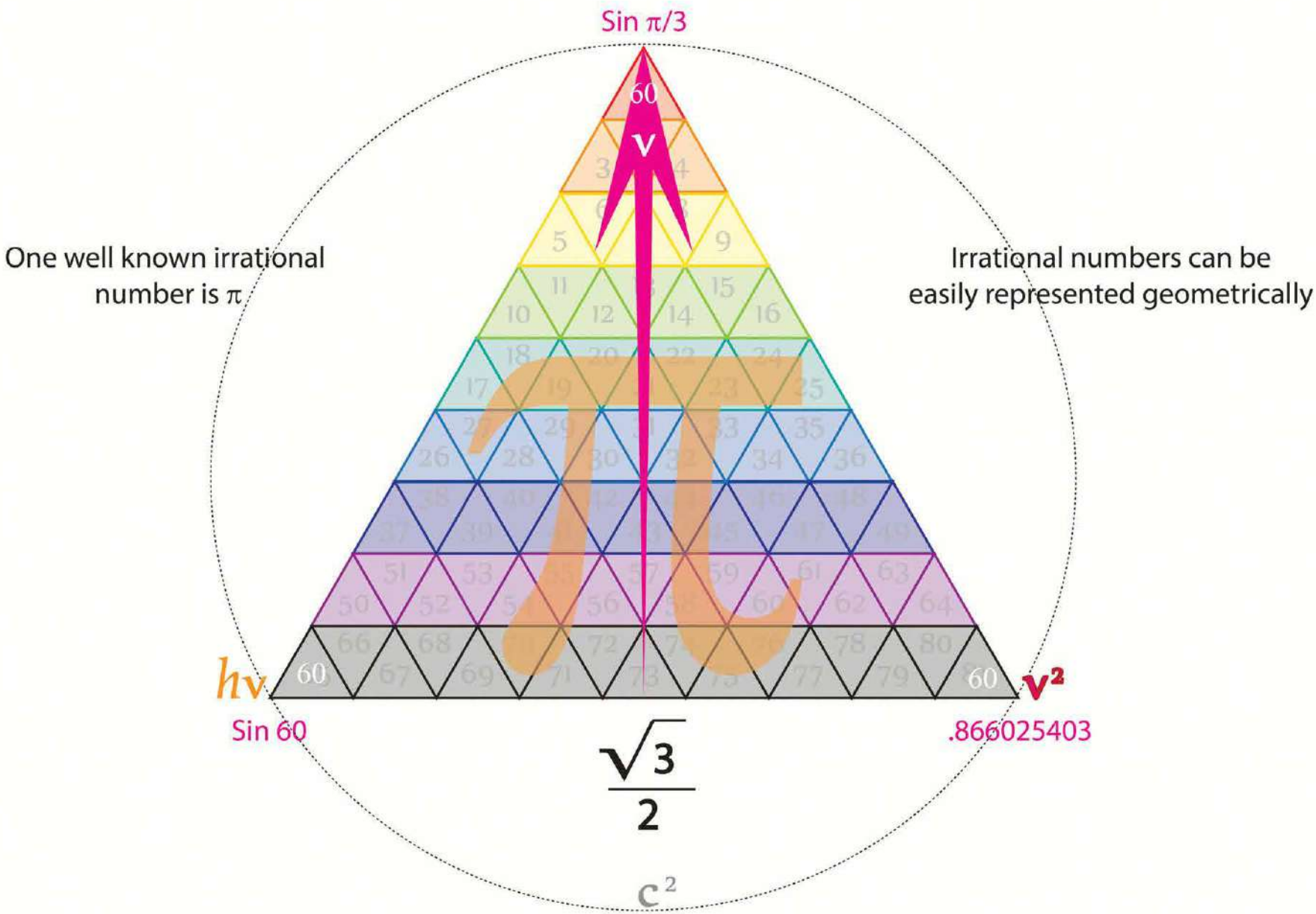
Irrational Numbers

An irrational number is defined to be any number that is the part of the real number system that cannot be written as a complete ratio of two integers



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Exponentials & Logarithms

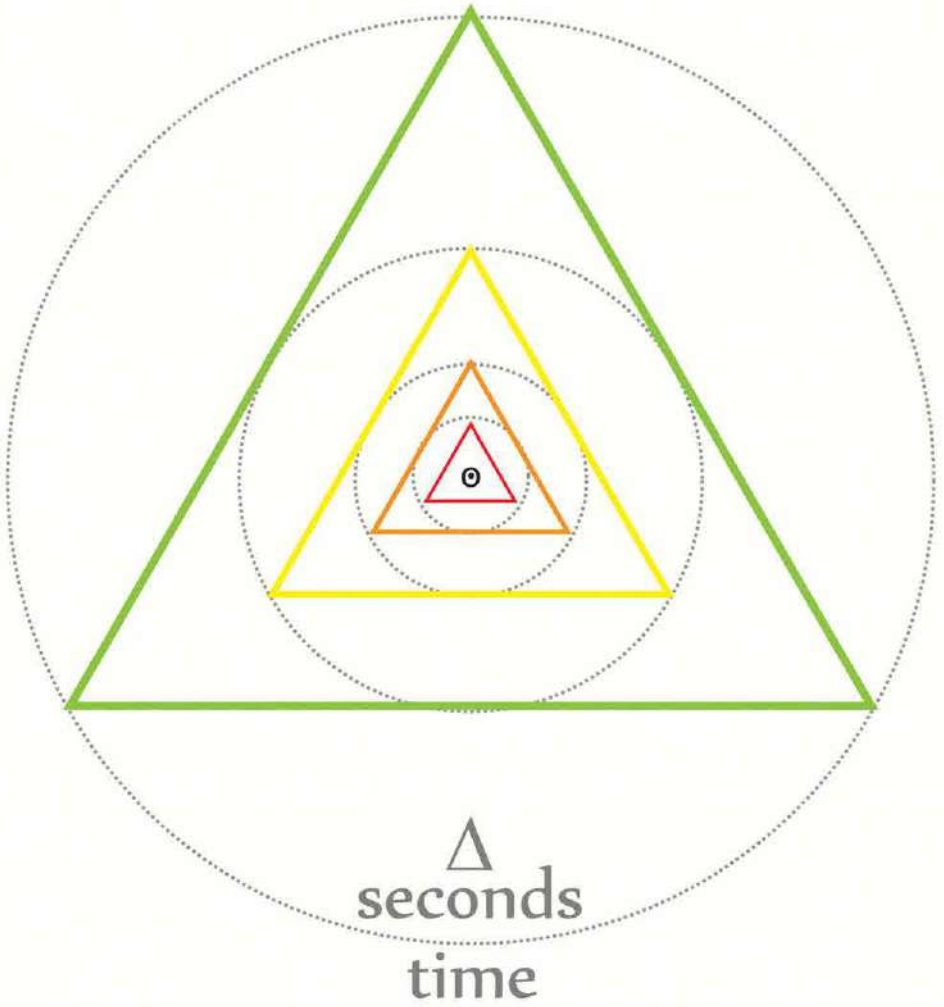
1	0
10	1
100	2
1,000	3

e and the Natural Log are inverse functions of each other:

e^x is the amount of continuous GROWTH after a certain amount of time.
Natural Log (ln) is the amount of TIME of continuous growth to reach a certain level

$10{,}000 = 10^4$

$\log(10{,}000) = 4$



e

How much growth after x units of time
(and 100% continuous growth)

$$e^x = \lim_{n\to\infty}(1+x/n)^n,$$

GROWTH

ln

ln(x) lets us plug in continuous growth
and get the time it would take.

$$\ln(x) = \lim_{n\to\infty} n(x^{1/n}-1).$$

PERIOD

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Exponential growth

GEOMETRIC

3.141592654

π

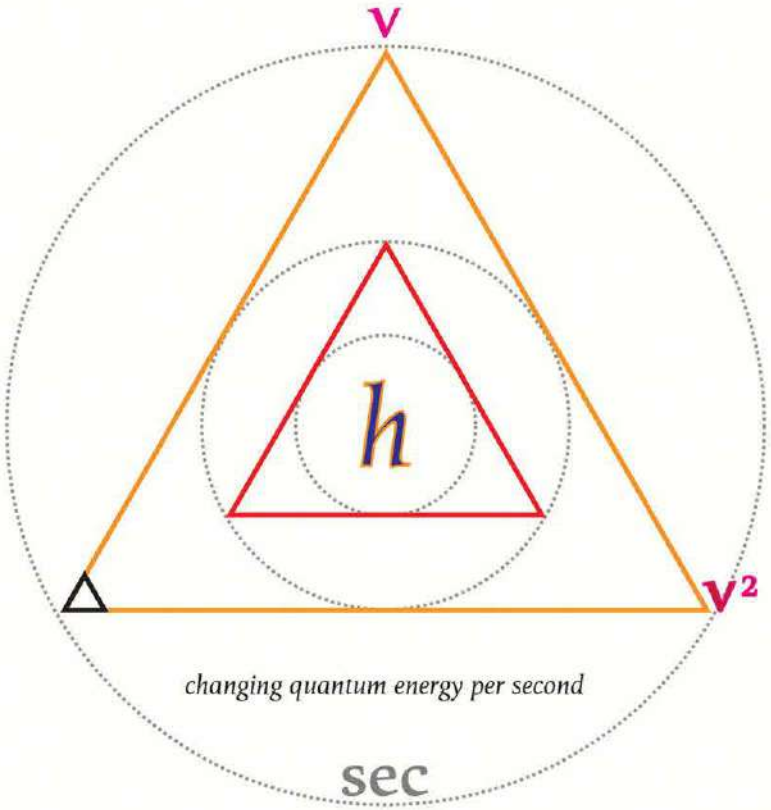
Pi is the ratio between circumference and diameter shared by all circles.

It is a fundamental ratio inherent in all circles and therefore impacts any calculation of circumference, area, volume, and surface areas

Pi radians are equally important and show all quantised equilateral energy geometries are related to their scribed circles

$$\text{growth} = e = \lim_{n \to \infty}\left(1 + \frac{r}{n}\right)^t$$

e represents the idea that all continually growing systems are scaled versions of a common rate



GROWTH

2.718281828

e

e is the base rate of growth shared by all continually growing processes.

e lets you take a simple growth rate (where all the change happens all at once at the end of a period of time - ie quantised growth)

e shows up whenever systems grow exponentially and continuously..... radioactive decay, interest calculations and populations

tetryons *EM fields* *quarks*

e can be applied to the equilateral energy geometries of physical systems only where the rate of increase is a integer factor of a squared number

leptons *Baryons*

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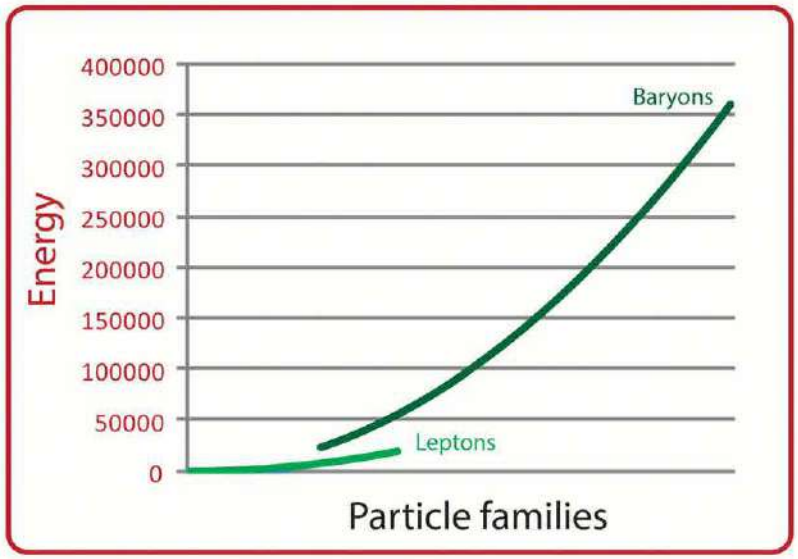
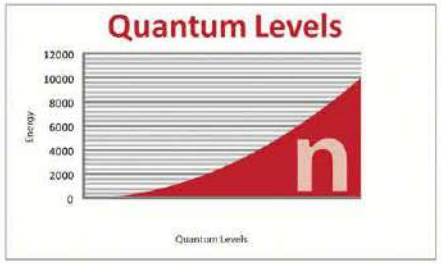
Nuclear Energy levels



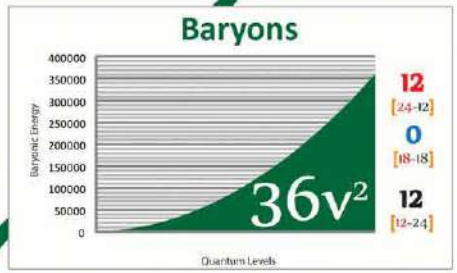
The emission and absorption of bosons and Photons within sub-atomic nuclei

Increase and decrease in integer amounts according to the charged Tetryonic topologies of the particles involved

Exponential energy levels



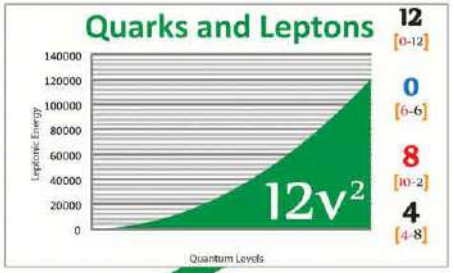
Radioactive decays follow exponential curves determined by the Tetryonic topology of the sub-atomic particle families



Proton
Neutron

antiNeutron
antiProton

$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field, Planck quanta; Baryons; ElectroMagnetic, mass, velocity)

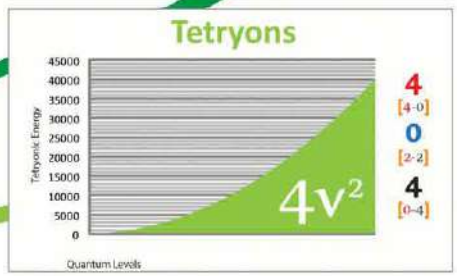


Electron
Positron

Neutrino

Up
Down
Strange
Charmed
Top
Bottom

$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (quarks, leptons; EM Field, Planck quanta; ElectroMagnetic, mass, velocity)



Positive
Negative
Neutral

$4\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (tetryons; EM Field, Planck quanta; ElectroMagnetic, mass, velocity)

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Series addition & the Riemann Zeta Function

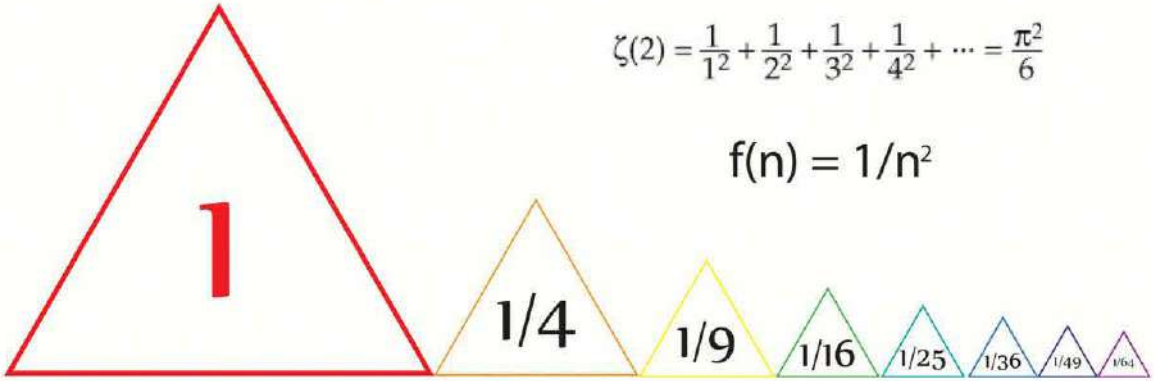
The second series addition of the Reimann Zeta function is where x=2: (pi^2)/6=1+1/2^2+1/3^2+1/4^2+...
(the sum of the reciprocals of the squares)

$$\zeta(s) = \sum_{n} \frac{1}{n^s}$$

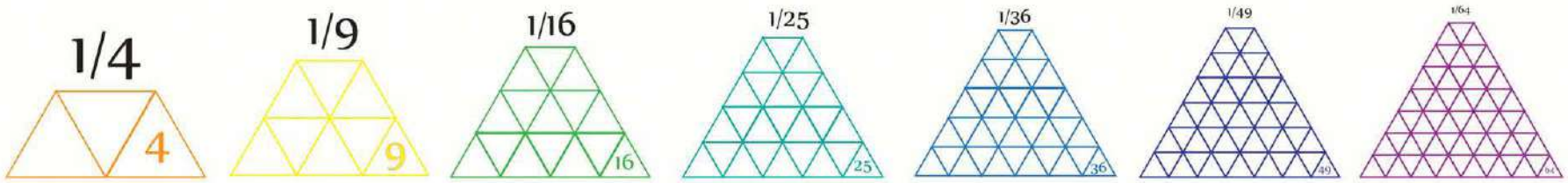
$$\zeta(2) = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots = \frac{\pi^2}{6}$$

$$\sum_{n=1}^{\infty} \frac{1}{n^x}$$

$$f(n) = 1/n^2$$



In mathematics, the Riemann zeta function, is a prominent function of great significance in number theory. It is a named after German mathematician Bernhard Riemann. It is so important because of its relation to the distribution of prime numbers. It also has applications in other areas such as physics, probability theory, and applied statistics



The mystery of prime numbers
Question: which natural numbers are prime? how are they distributed among natural numbers?

Primes are basic building blocks for natural numbers:

- any natural number is a product of prime numbers
- a prime number is only divisible by itself and by 1:
  (it cannot be further simplified)

We don't know how to predict where the prime numbers are:

"Prime numbers grow like weeds among the natural numbers, seeming to obey no other law than that of chance but also exhibit stunning regularity" (Don Zagier, number theorist)

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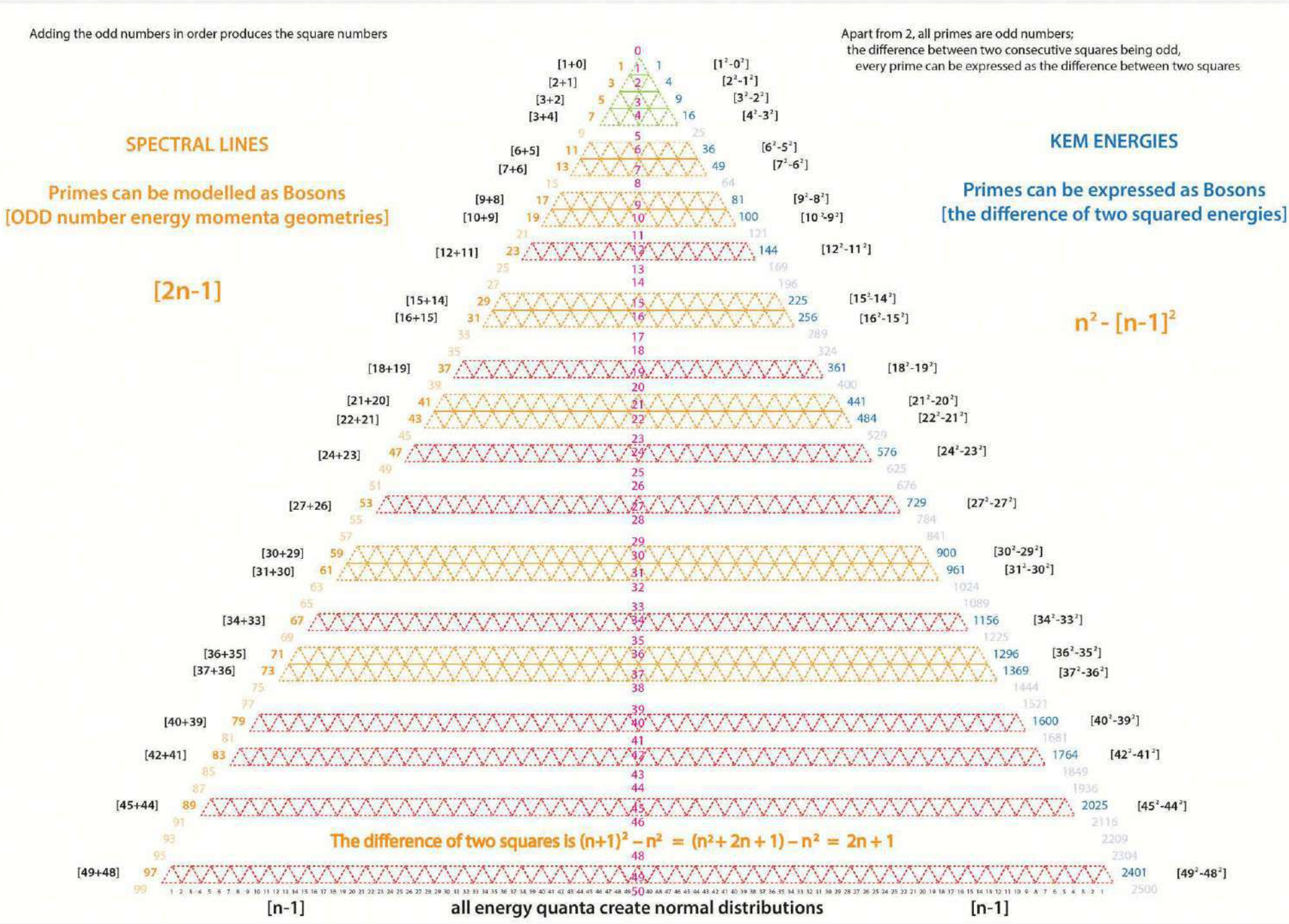
Adding the odd numbers in order produces the square numbers
Apart from 2, all primes are odd numbers;
the difference between two consecutive squares being odd,
every prime can be expressed as the difference between two squares
SPECTRAL LINES
Primes can be modelled as Bosons
[ODD number energy momenta geometries]
[2n-1]
KEM ENERGIES
Primes can be expressed as Bosons
[the difference of two squared energies]
n² - [n-1]²
[1+0] [2+1] [3+2] [3+4] [6+5] [7+6] [9+8] [10+9] [12+11] [15+14] [16+15] [18+19] [21+20] [22+21] [24+23] [27+26] [30+29] [31+30] [34+33] [36+35] [37+36] [40+39] [42+41] [45+44] [49+48]
[1²-0²] [2²-1²] [3²-2²] [4²-3²] [6²-5²] [7²-6²] [9²-8²] [10²-9²] [12²-11²] [15²-14²] [16²-15²] [18²-19²] [21²-20²] [22²-21²] [24²-23²] [27²-27²] [30²-29²] [31²-30²] [34²-33²] [36²-35²] [37²-36²] [40²-39²] [42²-41²] [45²-44²] [49²-48²]
The difference of two squares is (n+1)² – n² = (n²+ 2n + 1) – n² = 2n + 1
[n-1]
all energy quanta create normal distributions
[n-1]

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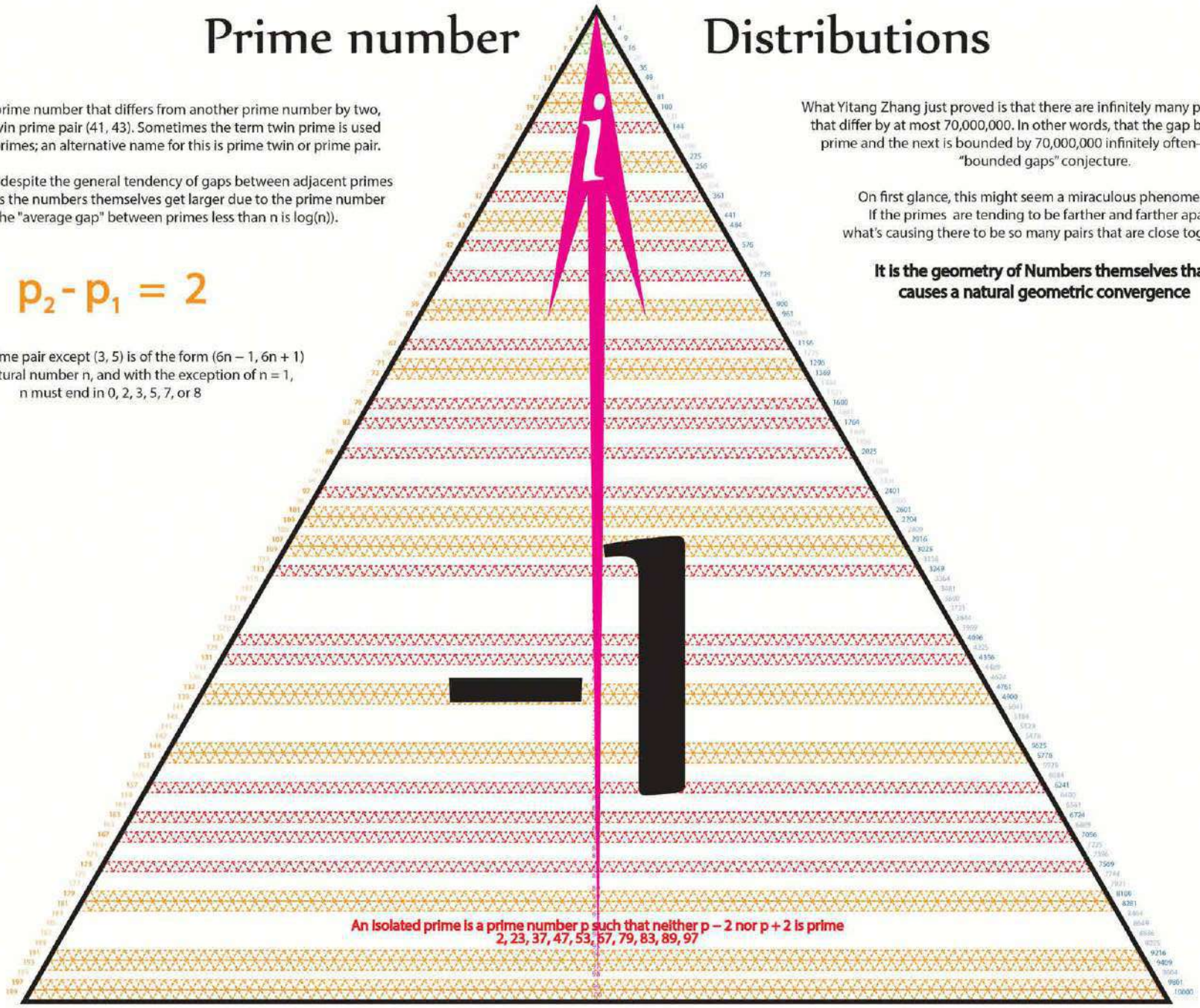
Prime number Distributions

A twin prime is a prime number that differs from another prime number by two, for example the twin prime pair (41, 43). Sometimes the term twin prime is used for a pair of twin primes; an alternative name for this is prime twin or prime pair.

Twin primes appear despite the general tendency of gaps between adjacent primes to become larger as the numbers themselves get larger due to the prime number theorem (the "average gap" between primes less than n is log(n)).

$$p_2 - p_1 = 2$$

Every twin prime pair except (3, 5) is of the form (6n – 1, 6n + 1) for some natural number n, and with the exception of n = 1, n must end in 0, 2, 3, 5, 7, or 8



What Yitang Zhang just proved is that there are infinitely many pairs of primes that differ by at most 70,000,000. In other words, that the gap between one prime and the next is bounded by 70,000,000 infinitely often—thus, the "bounded gaps" conjecture.

On first glance, this might seem a miraculous phenomenon. If the primes are tending to be farther and farther apart, what's causing there to be so many pairs that are close together?

It is the geometry of Numbers themselves that causes a natural geometric convergence

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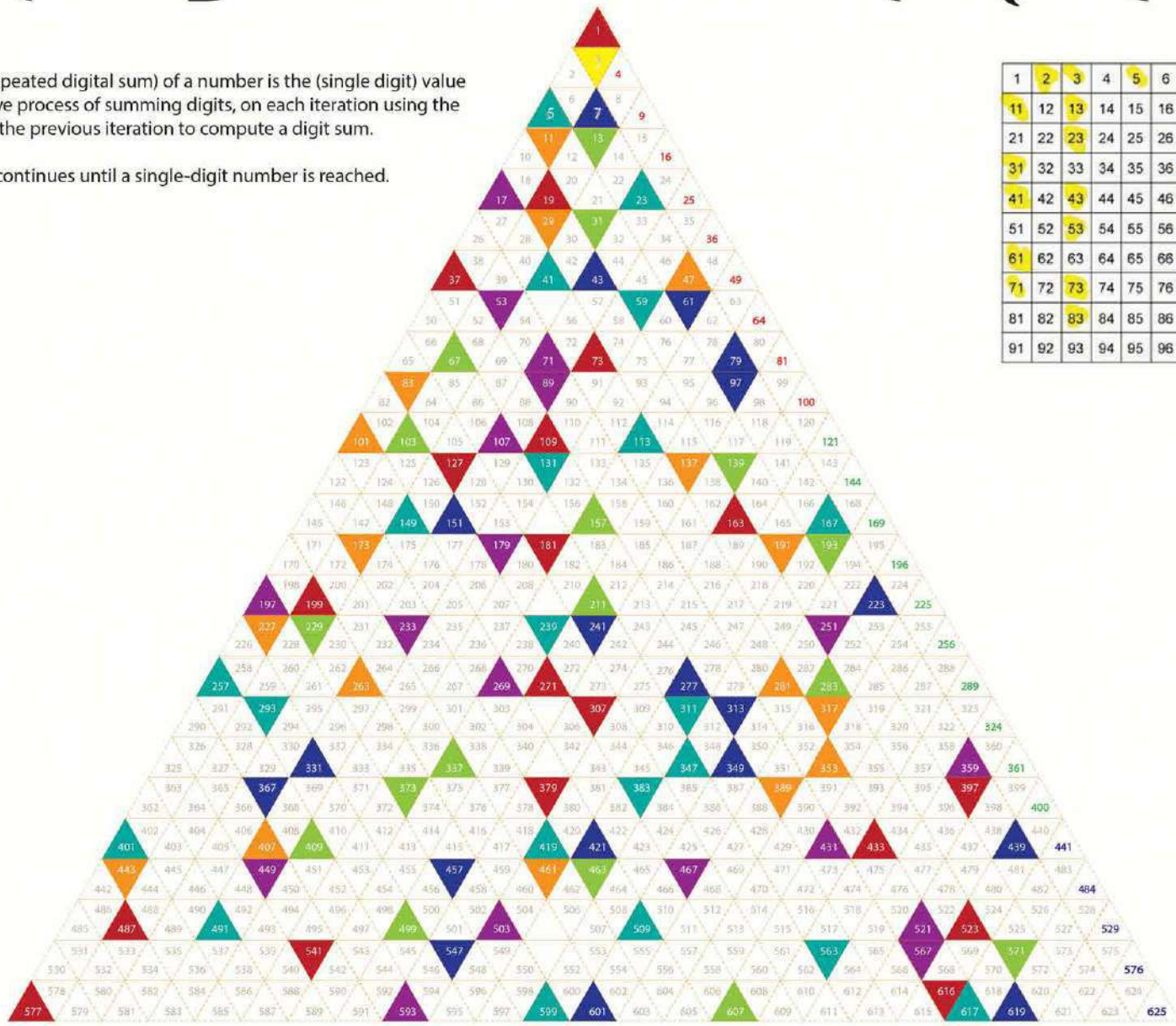
The Digital roots of Prime numbers

The digital root (also repeated digital sum) of a number is the (single digit) value obtained by an iterative process of summing digits, on each iteration using the result from the previous iteration to compute a digit sum.

The process continues until a single-digit number is reached.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



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Archimedes is given credit for the first calculus.

Archimedes infinite series

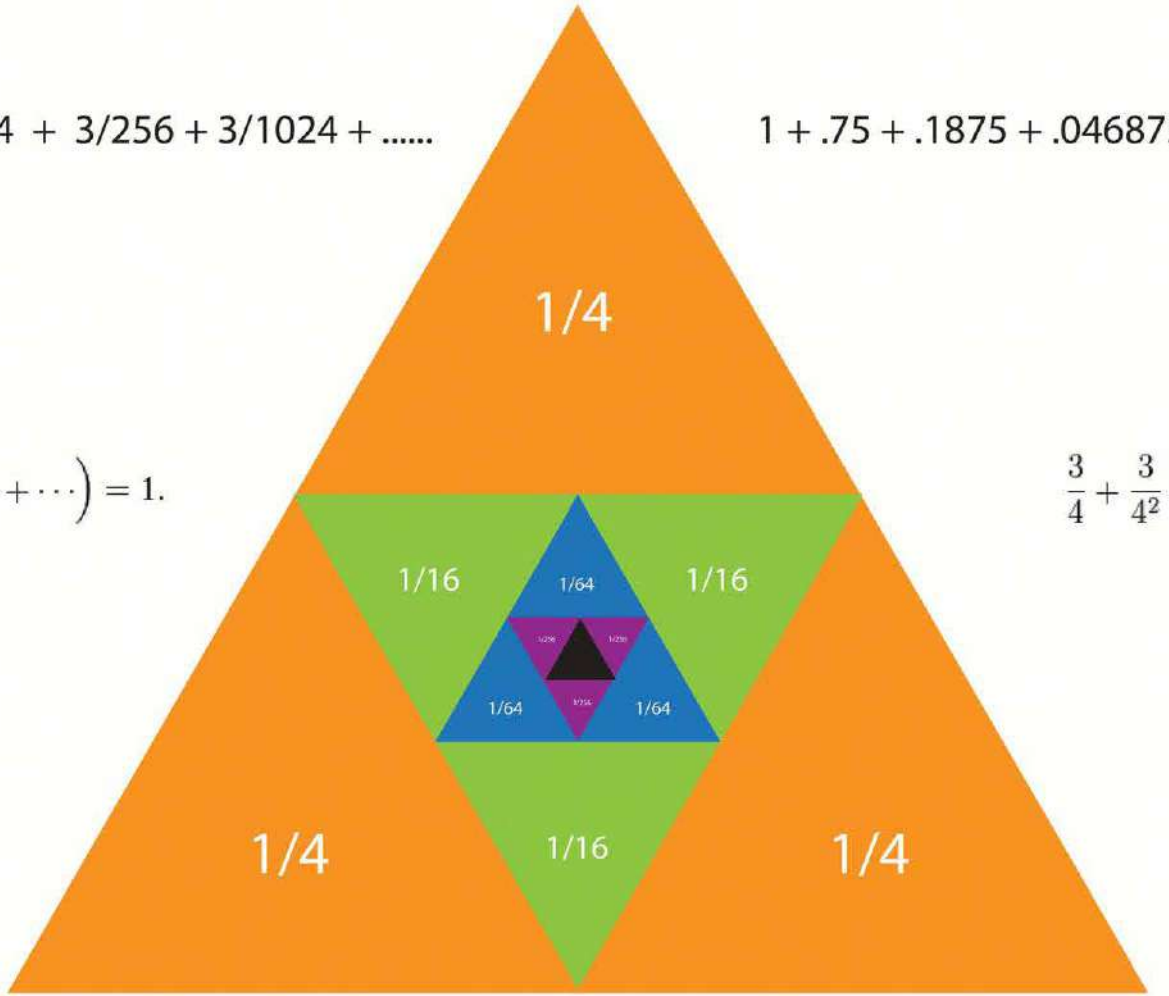
Today's calculus was published by Newton.

$1 + 3/4 + 3/16 + 3/64 + 3/256 + 3/1024 + ...$

$1 + .75 + .1875 + .046875 + .01171875 + ...$

$$3\left(\frac{1}{4} + \frac{1}{4^2} + \frac{1}{4^3} + \frac{1}{4^4} + \cdots\right) = 1.$$

$$\frac{3}{4} + \frac{3}{4^2} + \frac{3}{4^3} + \frac{3}{4^4} + \cdots = 1.$$



Nested convergent infinite series

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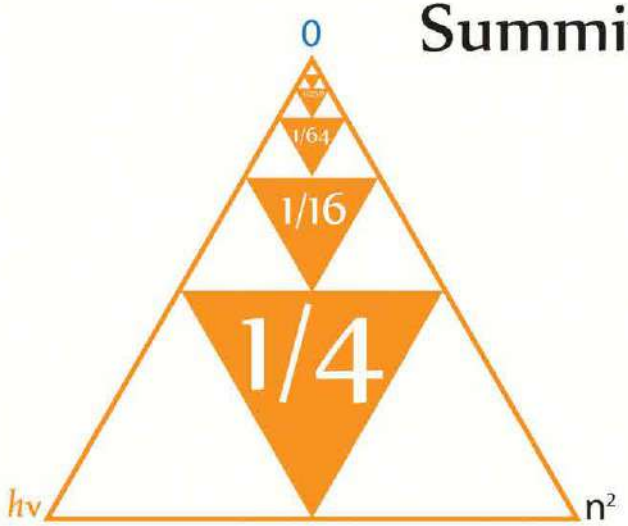
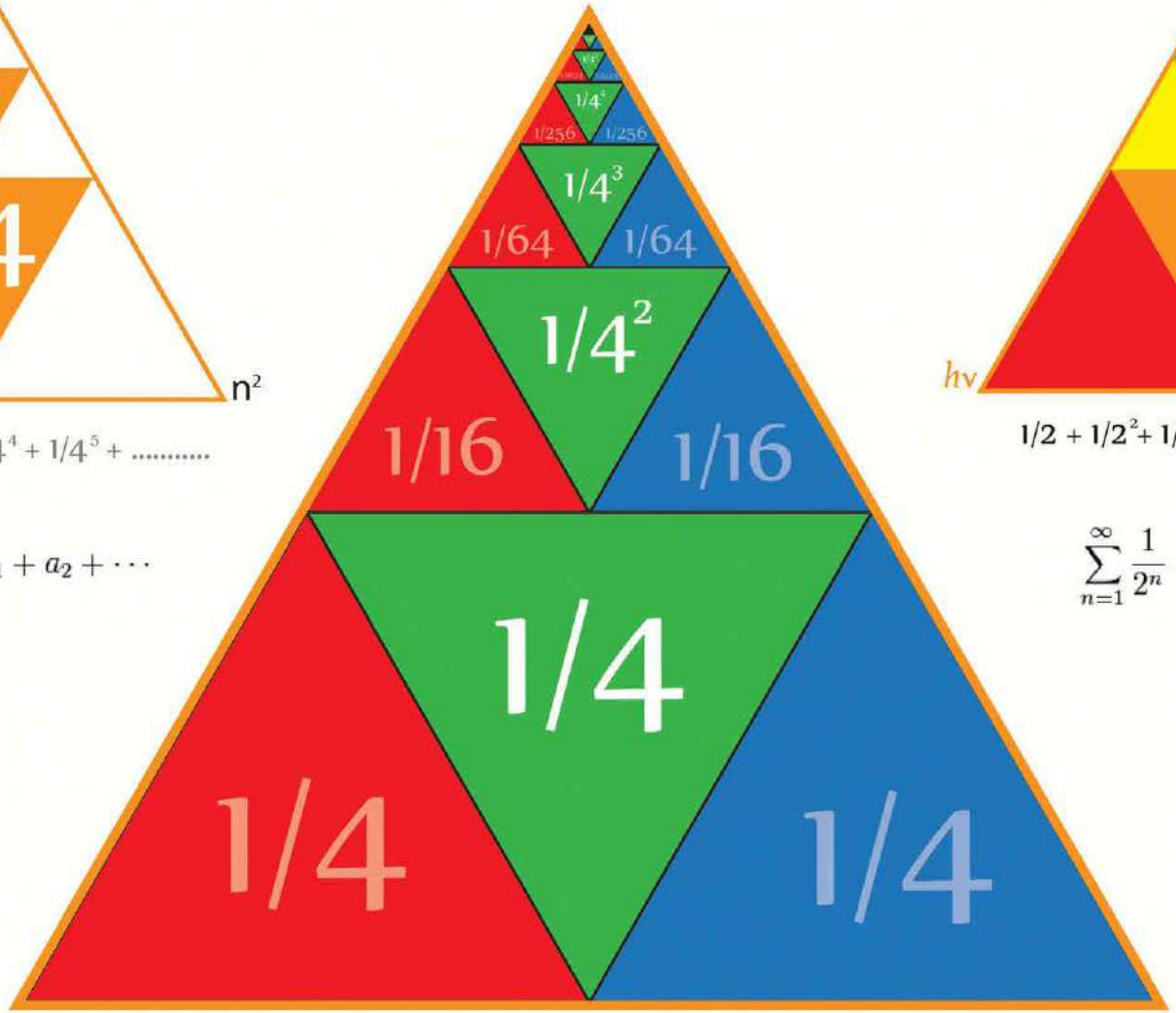
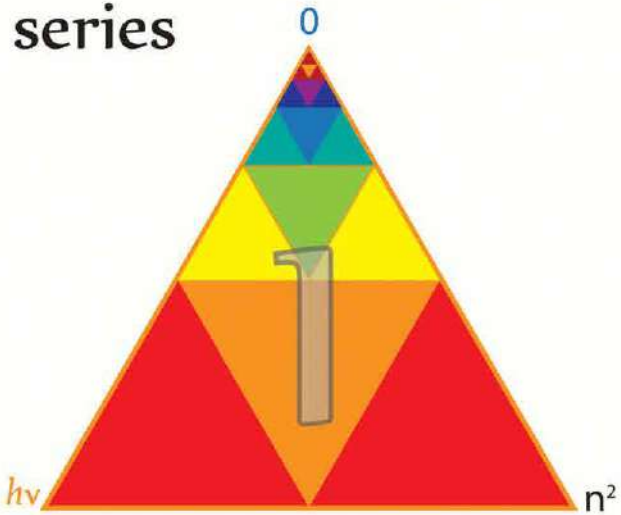
Summing a convergent infinite series



$1/4 + 1/4^2 + 1/4^3 + 1/4^4 + 1/4^5 + \ldots\ldots\ldots$

$$\sum_{n=0}^{\infty} a_n = a_0 + a_1 + a_2 + \cdots$$





$1/2 + 1/2^2 + 1/2^3 + 1/2^4 + 1/2^5 + \ldots\ldots\ldots$

$$\sum_{n=1}^{\infty} \frac{1}{2^n} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots.$$

ODDS = 2n-1

$$\sum_{1}^{n} 2n\text{-}1 = n^2$$

Summing the dissimilar coloured equilateral triangles gives unity

1/3 1/3 1/3

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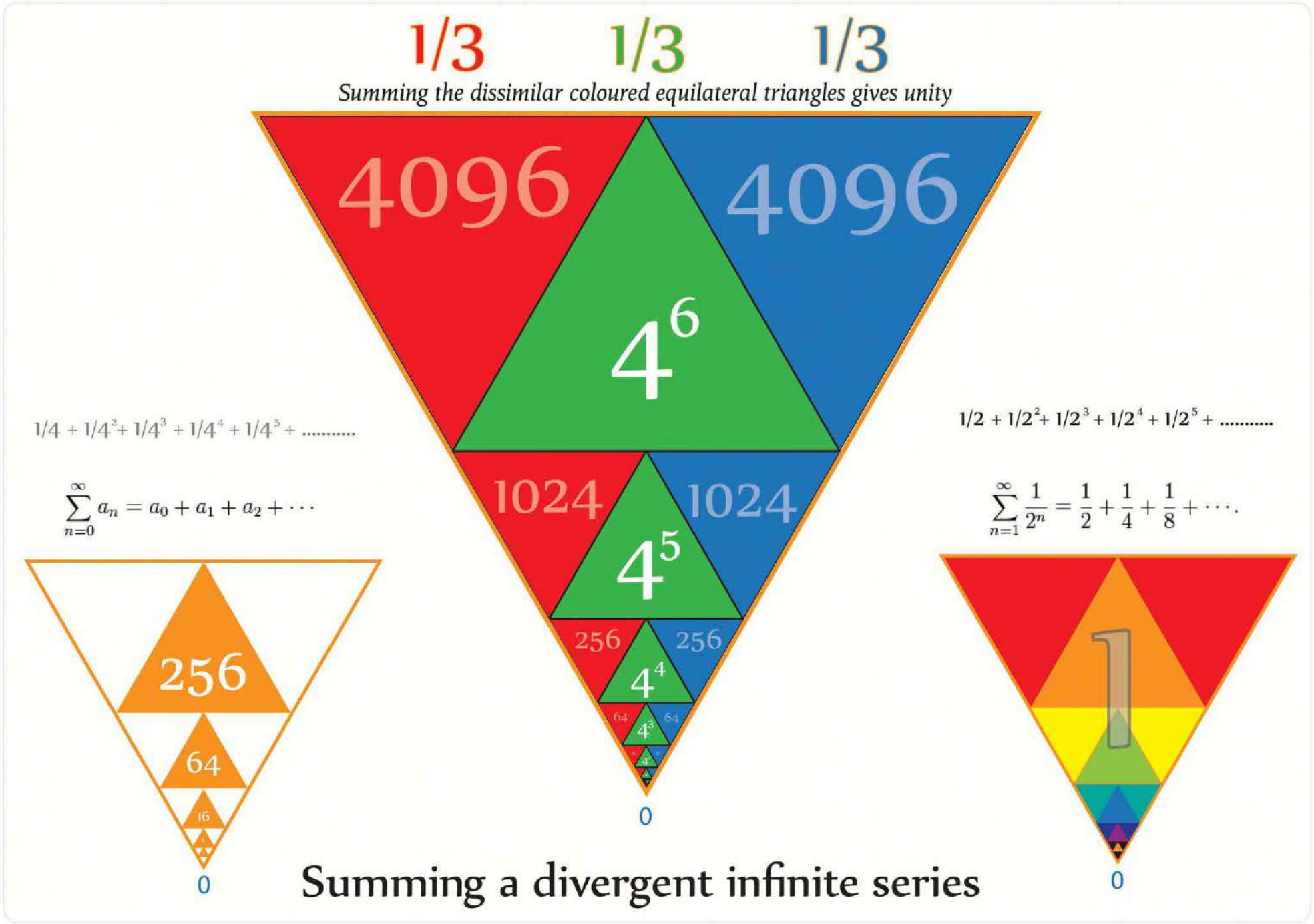

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The Basel Problem

Pietro Mengoli

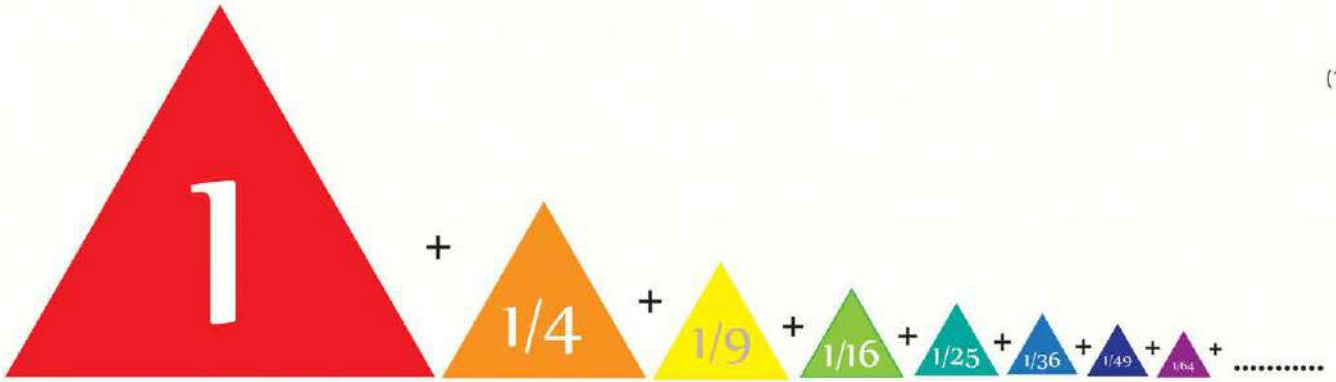
(1626 – June 7, 1686)

Leonhard Euler

(15 April 1707 – 18 Sept 1783)

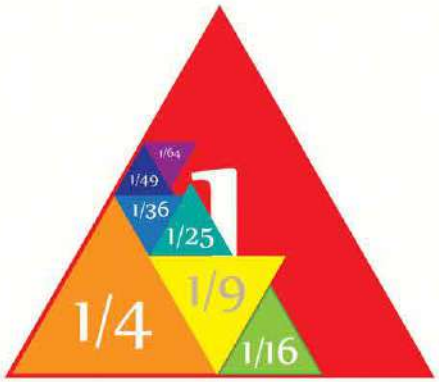
The Basel problem is a famous problem in mathematical analysis with relevance to number theory, first posed by Pietro Mengoli in 1644 and solved by Leonhard Euler in 1735.

$$\zeta(2) = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots = \frac{\pi^2}{6} \approx 1.644934$$

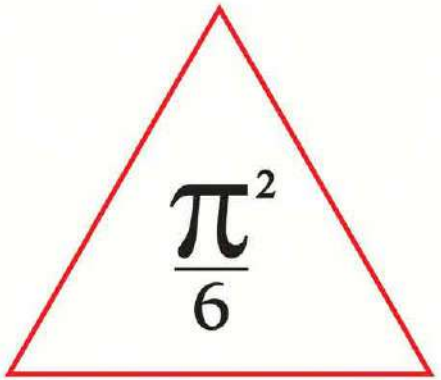


The Basel problem asks for the precise summation of the reciprocals of the squares of the natural numbers, i.e. the precise sum of the infinite series

$$f(n) = 1/n^2$$



$\approx$



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Integrals of mass-energy

is a means of finding scalar areas using summation and limits.

Integration is a micro adding of ***CONTINUOUS*** quantities.

$$\int_{n}^{\infty} f(x)$$

Integration is a special case of summation.

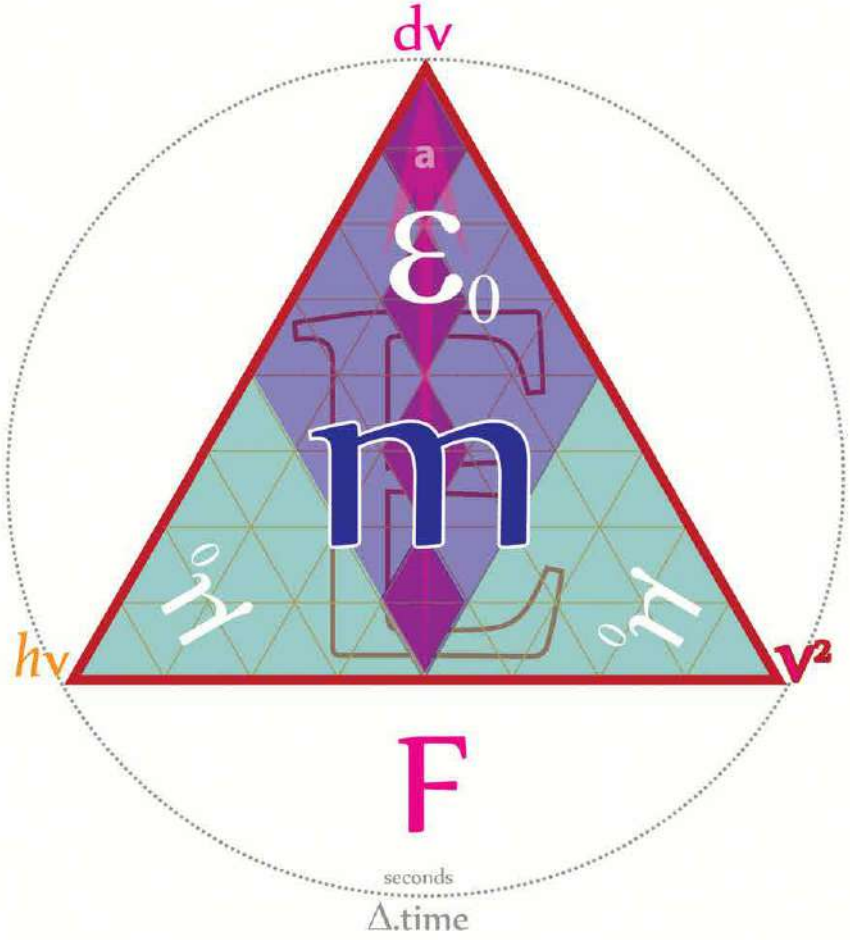
Integration is defined as the limit of a summation as the number of elements approches infinity while a part of their respective value approaches zero.

Summation is the finite sum of multiple, fixed values.

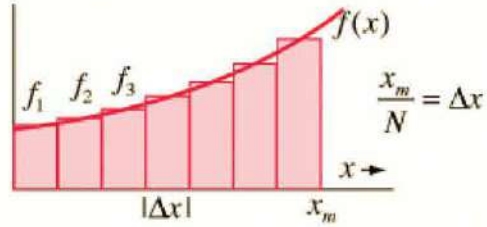
$$\sum_{n}^{\infty} x$$

Summation is a macro adding of ***DISCRETE*** quantities.

The summation of equilateral energy momenta quanta with respect to their linear vector components



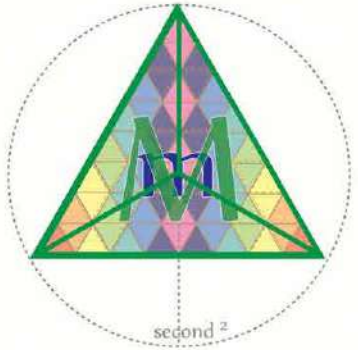
Integrating the energy quanta contained within equilateral charge geometry gives the variable Force required to acheive changes in motion [Energy, work, acceleration]



The Integral of the continuous area under the curve is the summation of an infinte number of disctrete rectangular measurements made to a specified limit

An integration isn't a simple summation, but the limit of a sequence of summations

All Planck energies are discrete equilateral geometries



mass is the surface integral of EM energy geometries per unit of time

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"The calculus of infinitesimals"

The fundamental theorem of calculus
simply states that the sum of infinitesimal changes in a quantity over time
adds up to the net change in the quantity.

Scalar Energy

$E = mv^2$

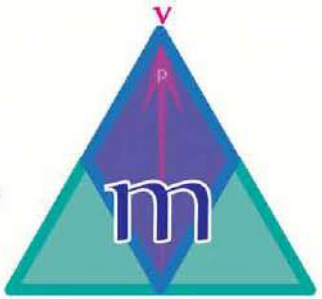
Leibniz's vis viva (Latin for living force) is mv2,

[2 x kinetic energy]

Gottfried Wilhelm von Leibniz

(July 1, 1646 – November 14, 1716)

vector Force



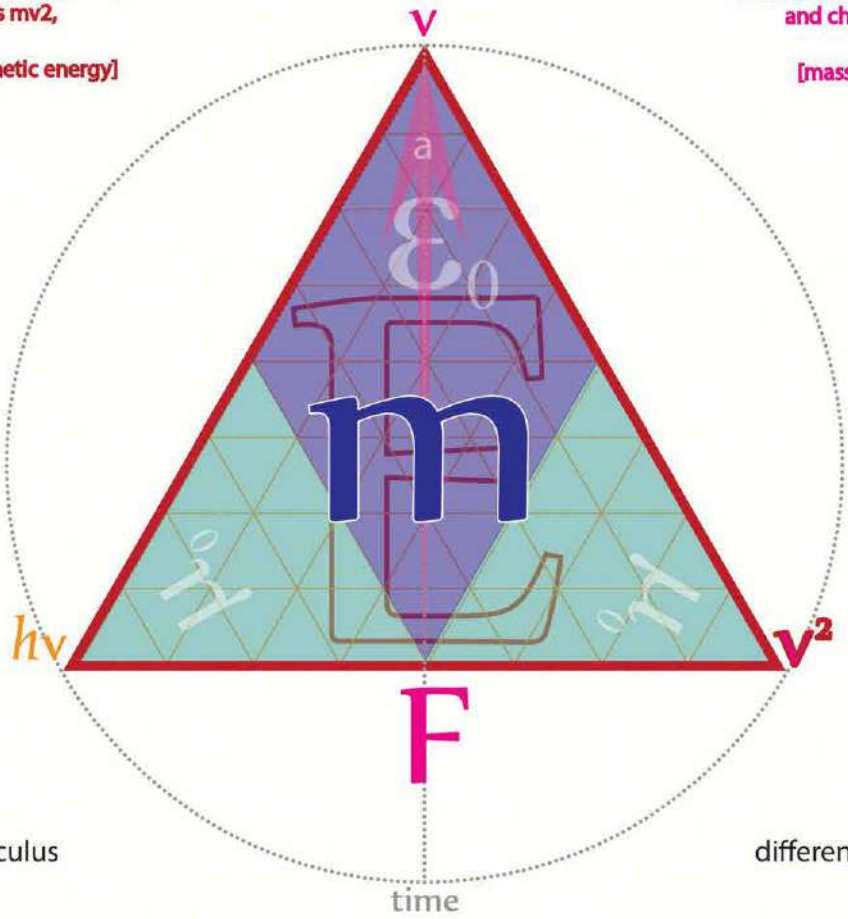
$F = m[dv/dt]$

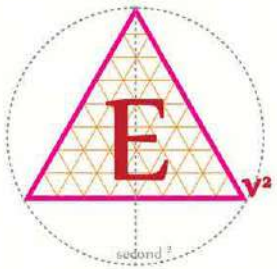
Much of Newton's work centred around momentum and changes to it

[mass.velocity]

Sir Isaac Newton

(1643-1727)

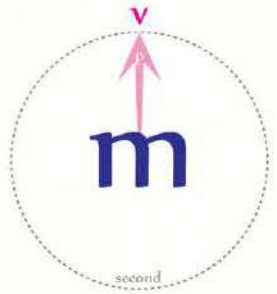




integral calculus

The founders of calculus thought of the integral as an infinite sum of rectangles of infinitesimal width

differential calculus



In calculus, a branch of mathematics, the derivative is a measure of how a function changes as its input changes

The fundamental theorem of calculus is a theorem that links the concept of the integral with the derivative of a function.

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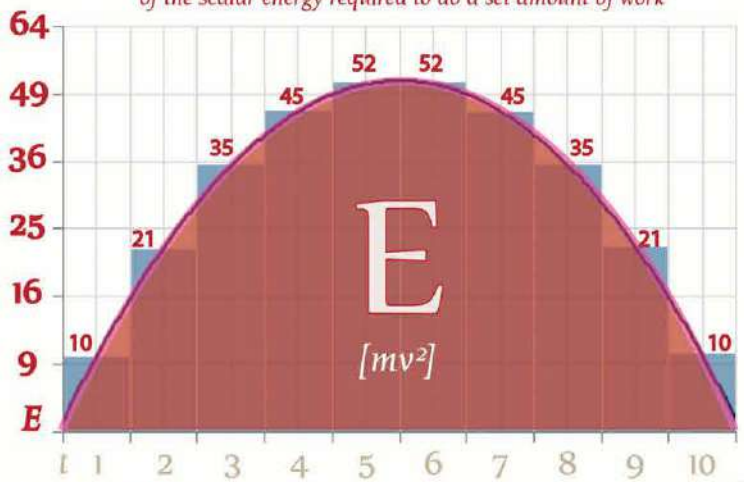
Leibniz
scalar energies

linear momentum is the square root vector force of the scalar energy required to do a set amount of work



Energy momentum geometries

$$E = p^2$$

Energy momentum

$$kg\left[\frac{m}{s}\right]^2$$

print out this page

then cut out the 10 Planck energy momenta triangles shown

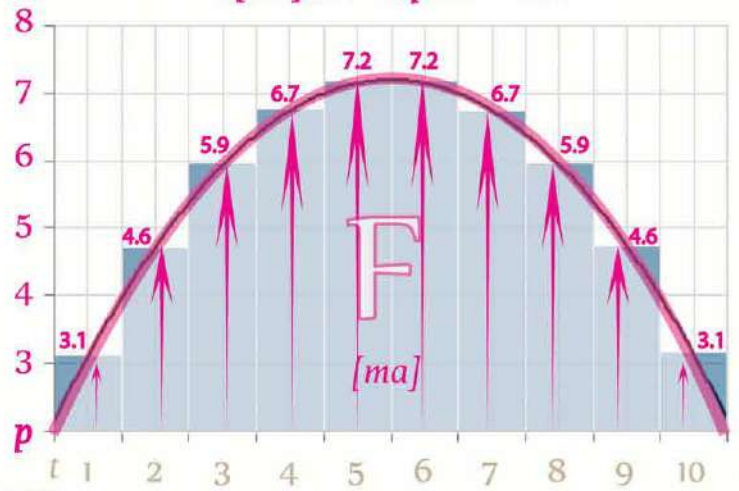
slice fine lines along the pink linear momentum arrows with a razor blade or similar as highlighted under the Newtonian acceleration curve

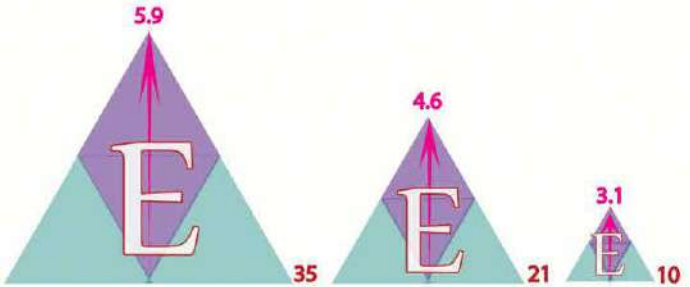
slide the cut-out triangles into the slots created

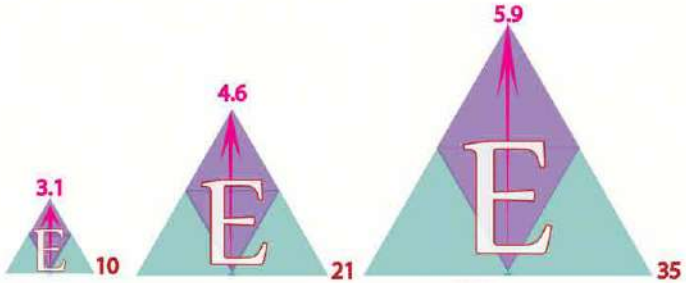
rotate the assembled model to show the real force momenta geometry at work

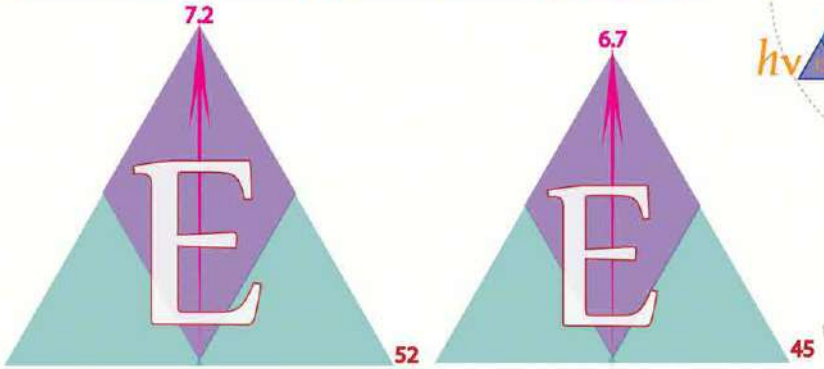
Newton
linear momentum

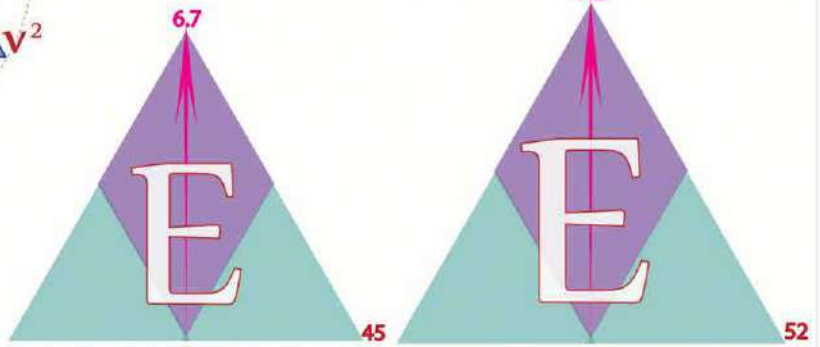
$$d[mv]/dt = dp/dt = ma$$











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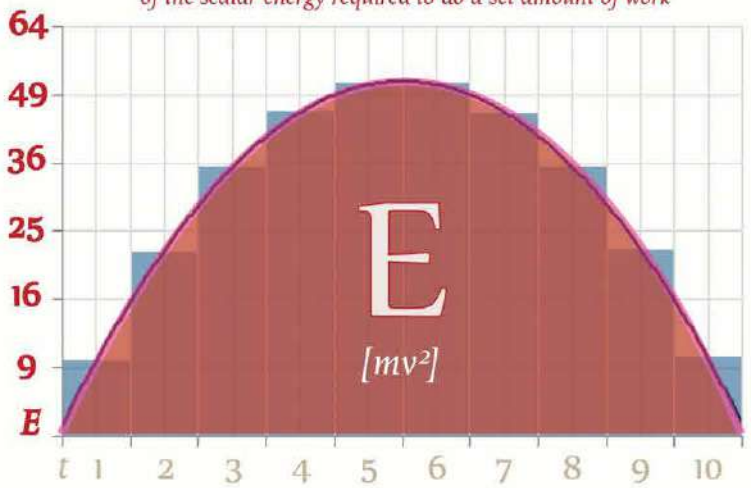
linear momentum is the square root vector force
of the scalar energy required to do a set amount of work



p
linear momentum
$\mathrm{kg}\,\frac{\mathrm{m}}{\mathrm{s}}$

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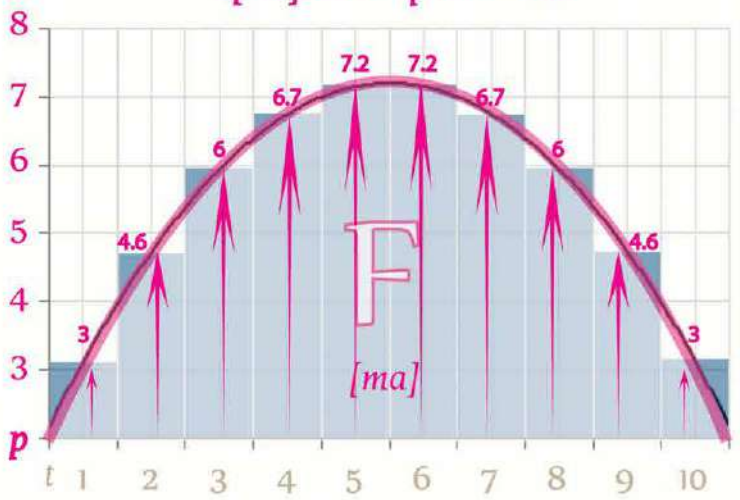
$d[mv]/dt = dp/dt = ma$

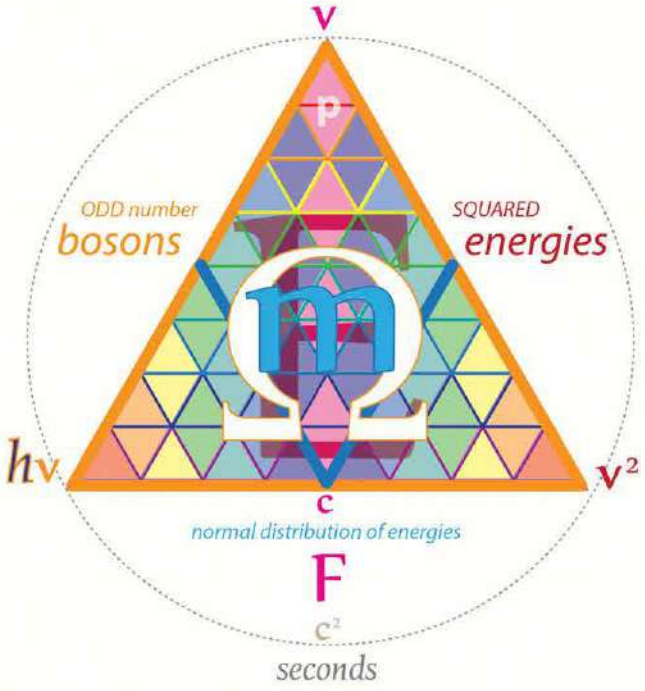


Leibniz
scalar energies

$E = mv^2$

mass-energy momenta relationship

square root equilateral energy is linear momentum



Newton
linear momentum

$F = ma$

mass is a scalar constant relating Force to acceleration

$F = m\frac{\Delta v}{\Delta t}$

Planck quanta and their vector linear momentum
lie at 90 degrees to the angle use in the graphs of motion in calculus

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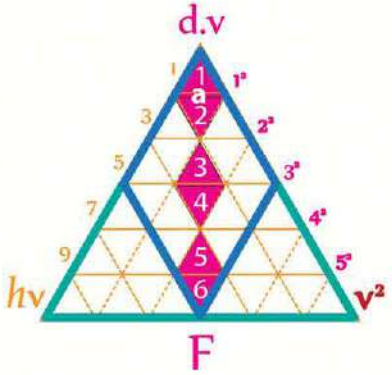
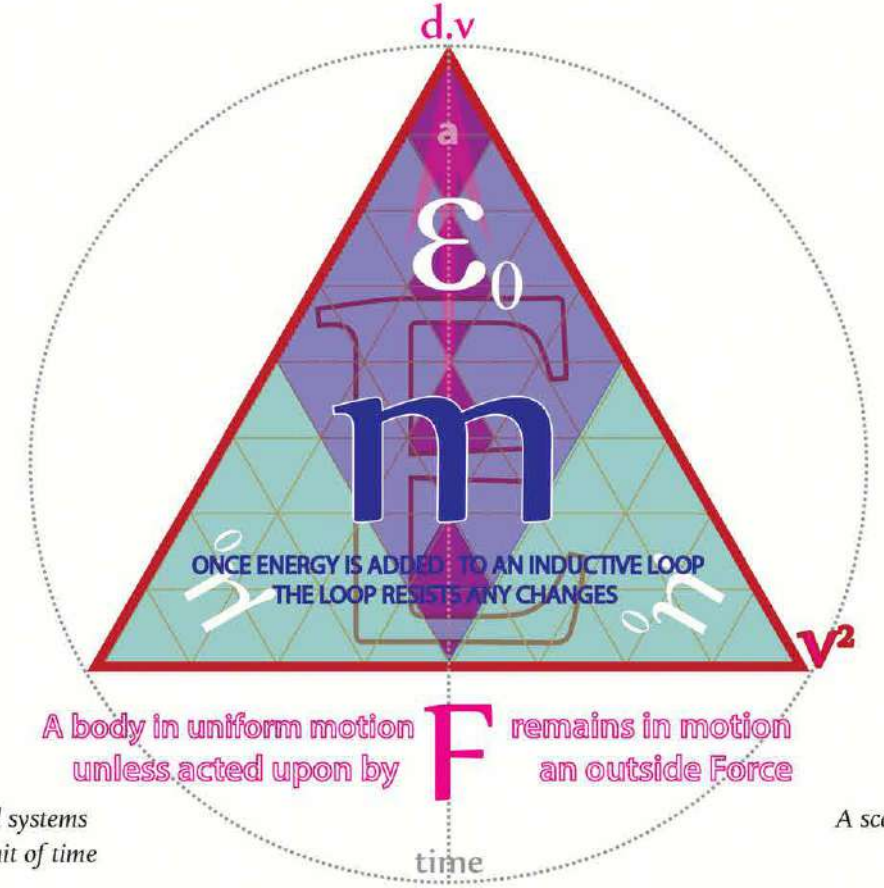
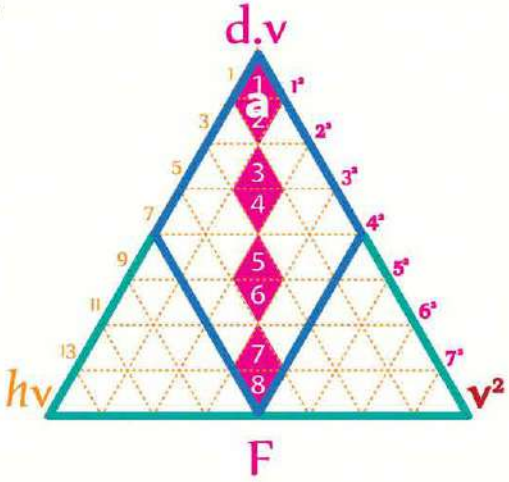
Differentiation

Differentiation is concerned with things like speeds and accelerations, slopes and curves etc.
These are Rates of Change, they are things that are defined locally.



An increase in a force opposing an object's vector velocity results in ***DECCELERATION***





An increase in a force in line with an object's vector velocity results in ***ACCELERATION***

A linear measure of Forces acting on physical systems resulting in changes to distance covered per unit of time

A scalar measure of Forces acting on physical systems resulting in changes to their rate of motion

$$v = \frac{\Delta d}{\Delta t}$$

$$= m/s$$

$$F = ma$$

In physics, the derivative of the displacement of a moving body with respect to time is the velocity of the body, and the derivative of velocity with respect to time is acceleration.

$$\sum \mathbf{F} = \frac{d\mathbf{p}}{dt} = m\frac{d\mathbf{v}}{dt} + \mathbf{v}\frac{dm}{dt}$$

Newton's second law of motion states that the derivative of the momentum of a body equals the force applied to the body.

$$a = \frac{\Delta v}{\Delta t}$$

$$= m/s^2$$

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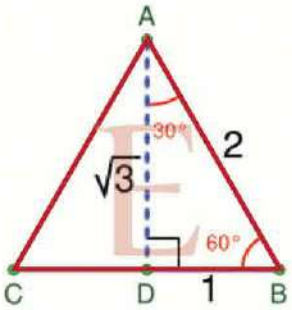
Visualising the geometric half-truths of relativistic physics

The source of all the physical relationships of mass-energy momenta and the constants in Physics is the Equilateral Triangle (and all texts must be corrected)



Energy geometries within Physics including Special Relativity with its Lorentz corrections have historically been incorrectly illustrated through the geometry of right angled triangles

Physics is geometry, one cannot be separated from the other

Equilateral geomtries lead to a intuitive understandings of Physics, Chemistry, Electrodynamics and Gravitation along with all the other apsects of Nature.

$$mv^2 = E = hv^2$$

ENERGY

6.629432673 e-34 J

Planck quanta

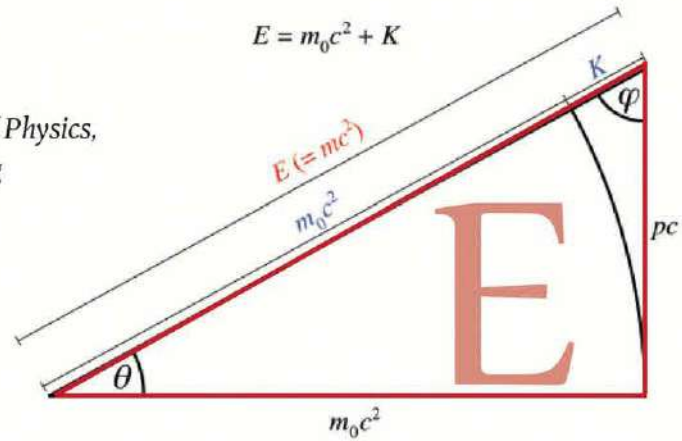
$[m\Omega v^2]$

mass velocity

7.376238634 e-51 kg

momentum

$$p^2 = mv^2$$



$$E^2 = p^2c^2 + m_0^2c^4$$

Generalizing, we see that the square of the total energy, mass, or distance in spacetime is the sum of the components squared.

We can see an origin of distance in spacetime relating to velocity in pc in which Energy is subject to Lorentz corrections [v/c]

$$E = pc.$$

Additionally, EM mass can be directly related tot the Energy content of a body by the velocity of Energy

$$E = mc^2$$

$$\mathbf{F}$$

$$\sum \mathbf{F} = \frac{d\mathbf{P}}{dt} = m\frac{d\mathbf{v}}{dt} = m\mathbf{a}$$

$$\mathbf{F} = m\mathbf{a}\,.$$

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Velocity

In physics, velocity is the measurement of the rate and direction of change in the position of an object.

It is a vector physical quantity; both magnitude and direction are required to define it.

The scalar absolute value (magnitude) of velocity is speed, a quantity that is measured in metres per second (m/s or ms−1) when using the SI (metric) system.

$$\frac{m}{s}$$

Speed is the scalar value of the
Distance traveled per unit of TIme

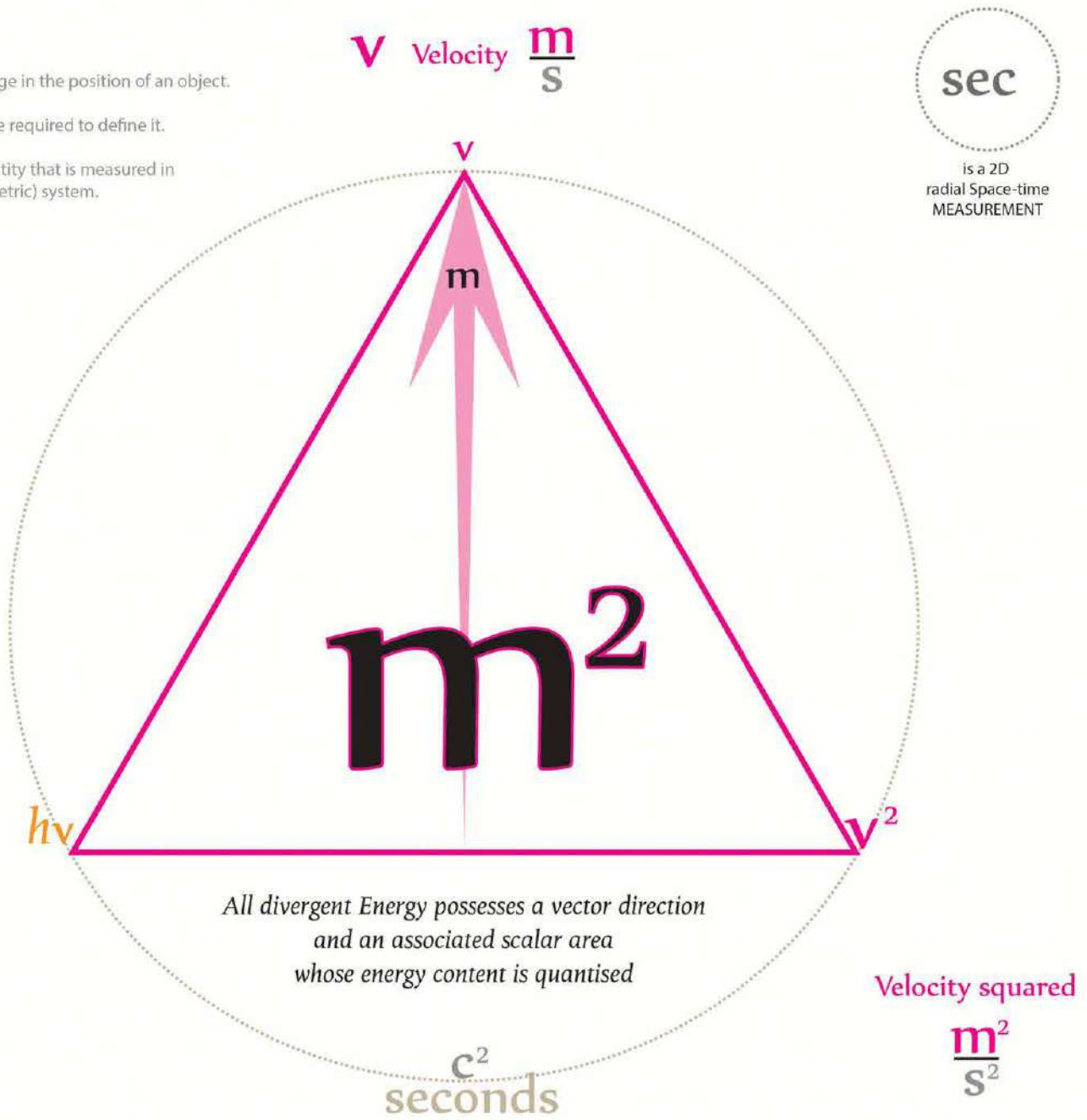
$$\bar{v} = \frac{\Delta x}{\Delta t}.$$

Velocity is the vector value of the
Distance traveled per unit of Time

$$\frac{\vec{m}}{s}$$

Velocity squared is the scalar value of the
Distance traveled per unit of Time squared
(Energy of a given spatial volume)

$$\frac{m^2}{s^2}$$



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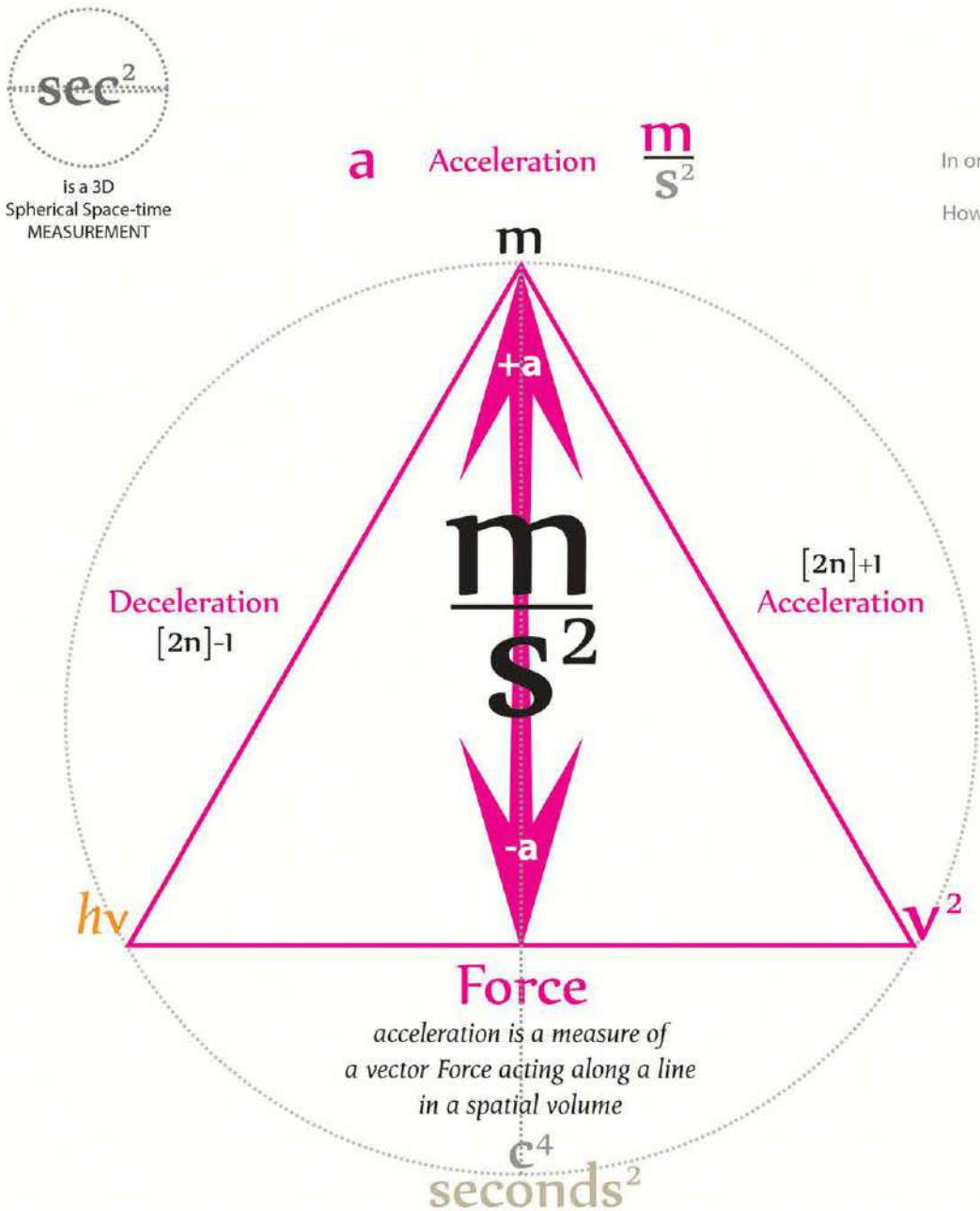

Acceleration

In physics, acceleration is the rate of change of velocity over time [dt]

In one dimension, acceleration is the rate at which something speeds up or slows down.

However, since velocity is a vector, acceleration describes the rate of change of both the magnitude and the direction of velocity.

Acceleration has the dimensions [Length]/[Time Squared]
In SI units, acceleration is measured in meters per second squared (m/s^2).

$$a = \frac{\Delta y}{\Delta x} = \frac{\Delta v}{\Delta t}.$$

In classical mechanics, for a body with constant mass,
the acceleration of the body is proportional to the net force acting on it
(Newton's second law)

$$F=ma \longrightarrow a=F/m$$

Force

$$kg\,\frac{m}{s^2}$$

Additionally, for a mass with constant velocity,
(ie in an inertial frame)
the energy of motion is expressed as its momentum
(acceleration causes changes in Energy-momentum)

$$p = kg\,\frac{m}{s}$$

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Momentum

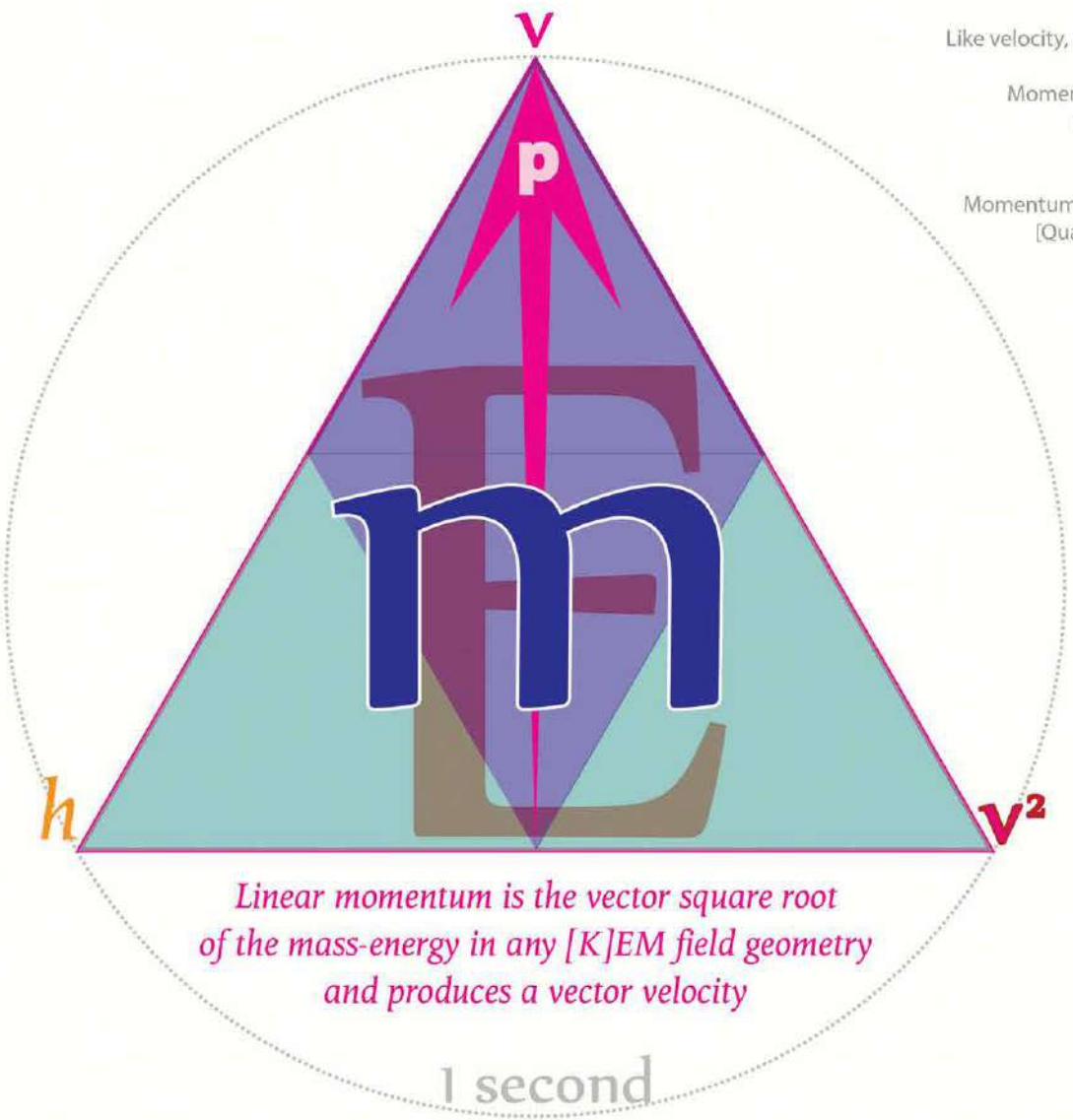
$kg\frac{m}{s}$ linear momentum **p**

In classical mechanics, momentum (pl. momenta; SI unit kg·m/s, or, equivalently, N·s) is the product of the mass and velocity of an object (p).

Like velocity, momentum is a vector quantity, possessing a direction as well as a magnitude.

Momentum is a conserved quantity (law of conservation of linear momentum), meaning that if a closed system is not affected by external forces, its total momentum cannot change.

Momentum should be referred to in its specific forms to distinguish it in its various forms [Quantised Angular, Linear, Rotational and quantum/nuclear momentum]



Linear momentum is the vector square root of the mass-energy in any [K]EM field geometry and produces a vector velocity

$$p = \frac{hv^2}{v} = mv$$

Although originally expressed in Newton's Second Law, the conservation of momentum also holds in special relativity and, with appropriate definitions, a (generalized) momentum conservation law holds in electrodynamics, quantum mechanics, quantum field theory, and general relativity.

In relativistic mechanics, non-relativistic momentum is further multiplied by the Lorentz factor.

$$p^2 = E = mv^2$$

Energy can be expressed as the square of linear momentum

$$kg\frac{m^2}{s^2}$$

equilateral Planck energy momenta

$$m\Omega v^2$$

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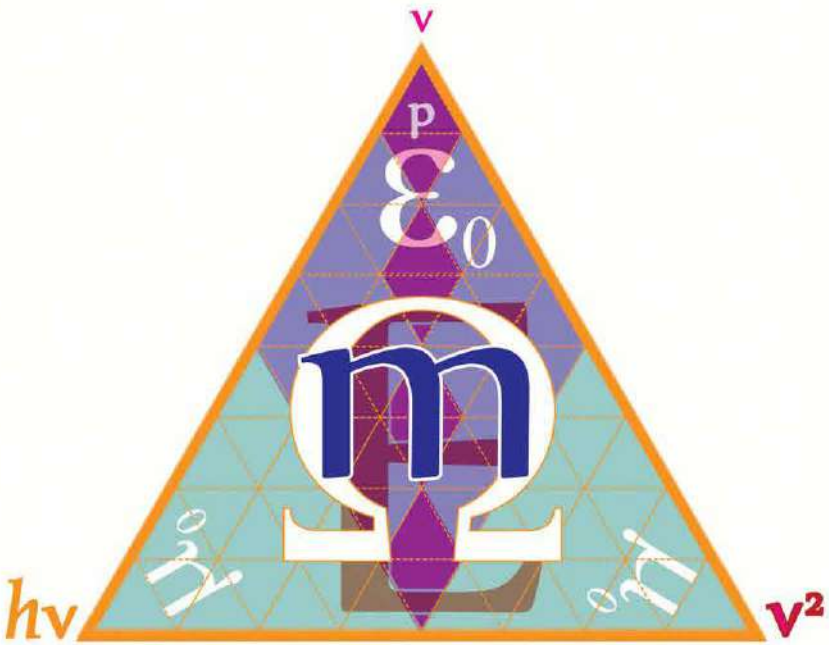
Energy-momentum relationship

The total number of equilateral Planck quanta [quantised mass-energy momenta] is directly related to the square of its linear momentum [mass-velocity]

Quantum Mechanics

$$h = \frac{E}{v^2}$$



Newtonian physics

$$m = \frac{E}{v^2}$$

Quantised energy equilateral momenta

$$hv^2$$

Quantised Energy momenta is related to Scalar mass energy momenta through the equilateral geometry of Planck's constant

Scalar energy linear momentum

$$pv$$

$$m\Omega v^2 = E = mv^2$$

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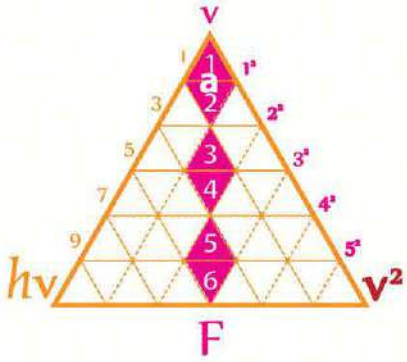
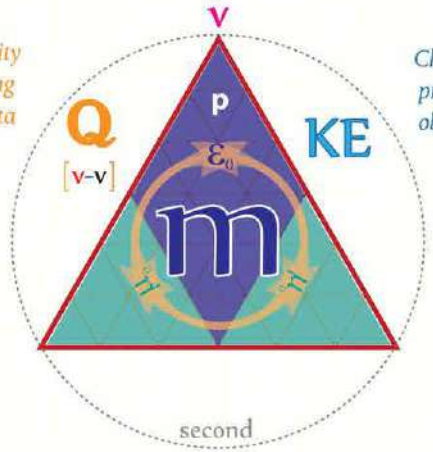
Inertial resistance to Force

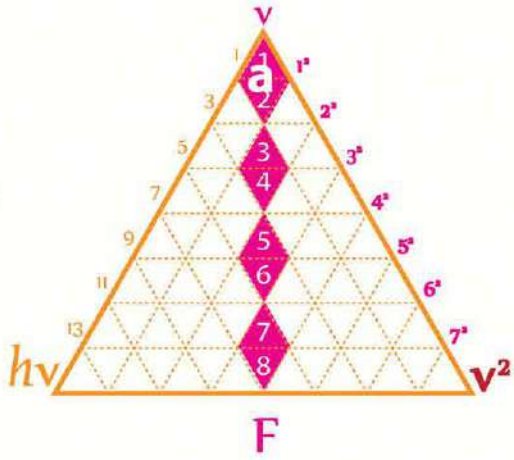
Inertia is the resistance of any physical object to a change in its state of motion.



Changes to mass-velocity require a corresponding change to boson quanta



Changes to mass-velocity produces a change in an object's Kinetic Energies



$$E = mc^2$$

The total intrinsic momenta of all energy waveforms is the sum of their constituent Quantised Angular momenta (mass-energy momenta)

$$M_0 = m/c^2$$

$$KEM = Mv^2$$

Matter in motion has Kinetic Energies in addition to invariant rest mass-Energy

KE = RE - rest Matter

Any change in motion results in changes to the Charge geometries creating in turn proportional changes to KEM mass and momenta components

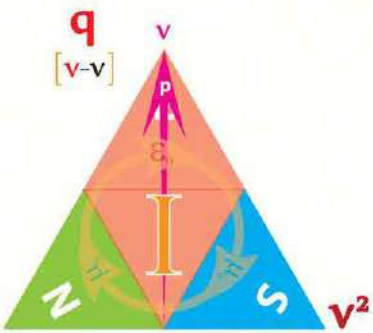
$$F = ma$$

The 'inductive resistance' of Charge quanta fields to changes in their mass-energy momenta content is what we term Inertia

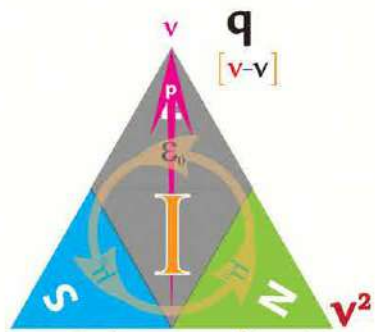
Any change to an object's velocity results in a corresponding change to its mass-Energy momenta which is reflected by its inertia

$$p^2 = E = mv^2$$

Inertial mass can be related to Charge through inductive Planck quanta



quantised moment of inertia



quantised moment of inertia

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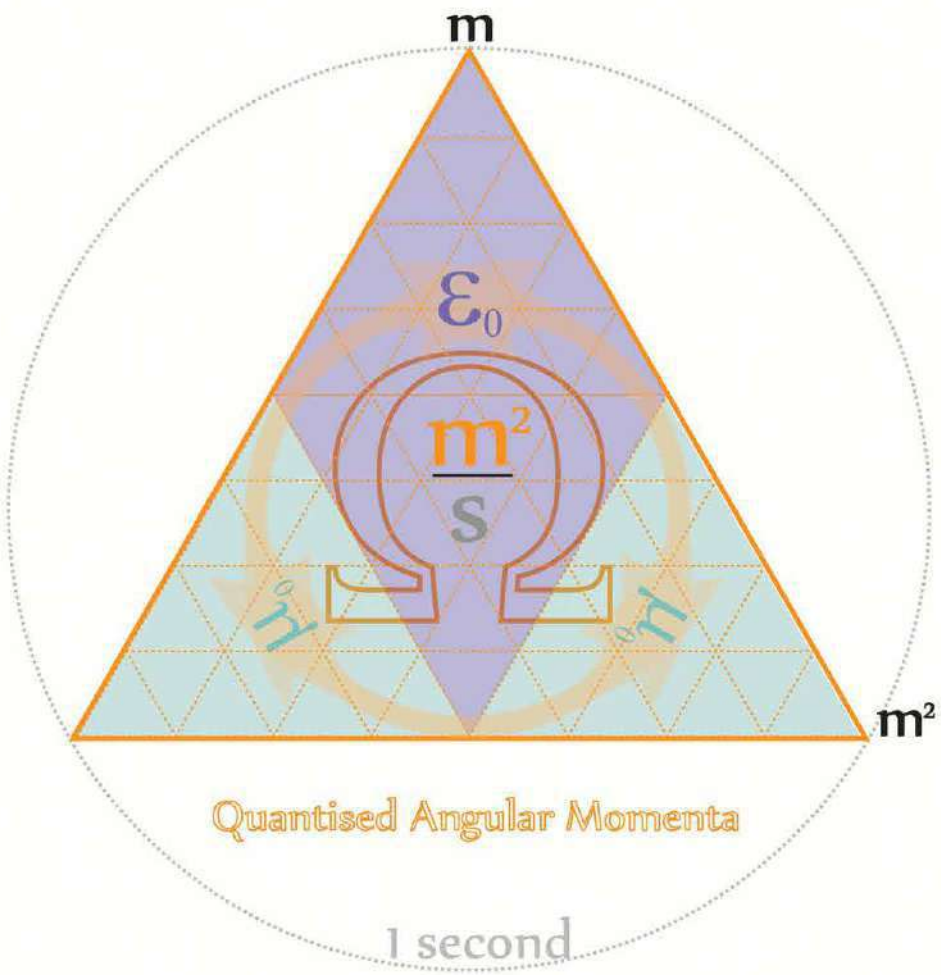
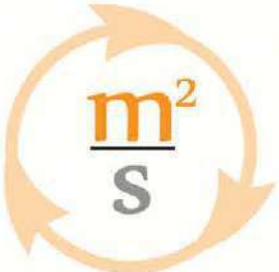
Quantised Angular momentum

As it is a physical [equilateral] geometry QAM is conservative in any system where there are no external Forces and serves as the foundational geometric source for all the conservation laws of physics



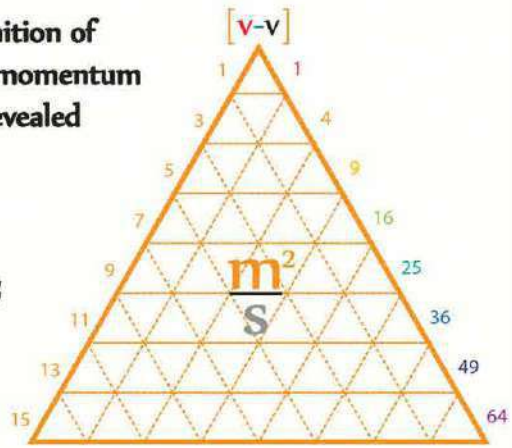
Angular momentum is sometimes described as the rotational analog of linear momentum, in Tetryonics it is revealed to be the equilateral geometry of quantised mass-energy momenta within any defined space-time co-ordinate system

A major re-definition of quantised angular momentum in physics is revealed



classical rotational angular momentum

≈



Quantised Angular momentum

In quantum mechanics, angular momentum is quantised – that is, it cannot vary continuously, but only in ODD number "quantum steps" between the allowed SQUARE nuclear Energy levels

In physics, angular momentum, moment of momentum, or rotational momentum is a conserved vector quantity that can be used to describe the overall state of a physical system.

When applied to specific mass-Energy-Matter systems QAM reveals the true quantum geometry and nature of Energy in our universe

h

$kg\frac{m^2}{s}$

$m\Omega$

mass x QAM

Planck's Constant

Normally viewed as an expression of rotational momentum Quantised Angular Momentum [QAM] is in fact a result of the equilateral geometric quantization of mass-energy

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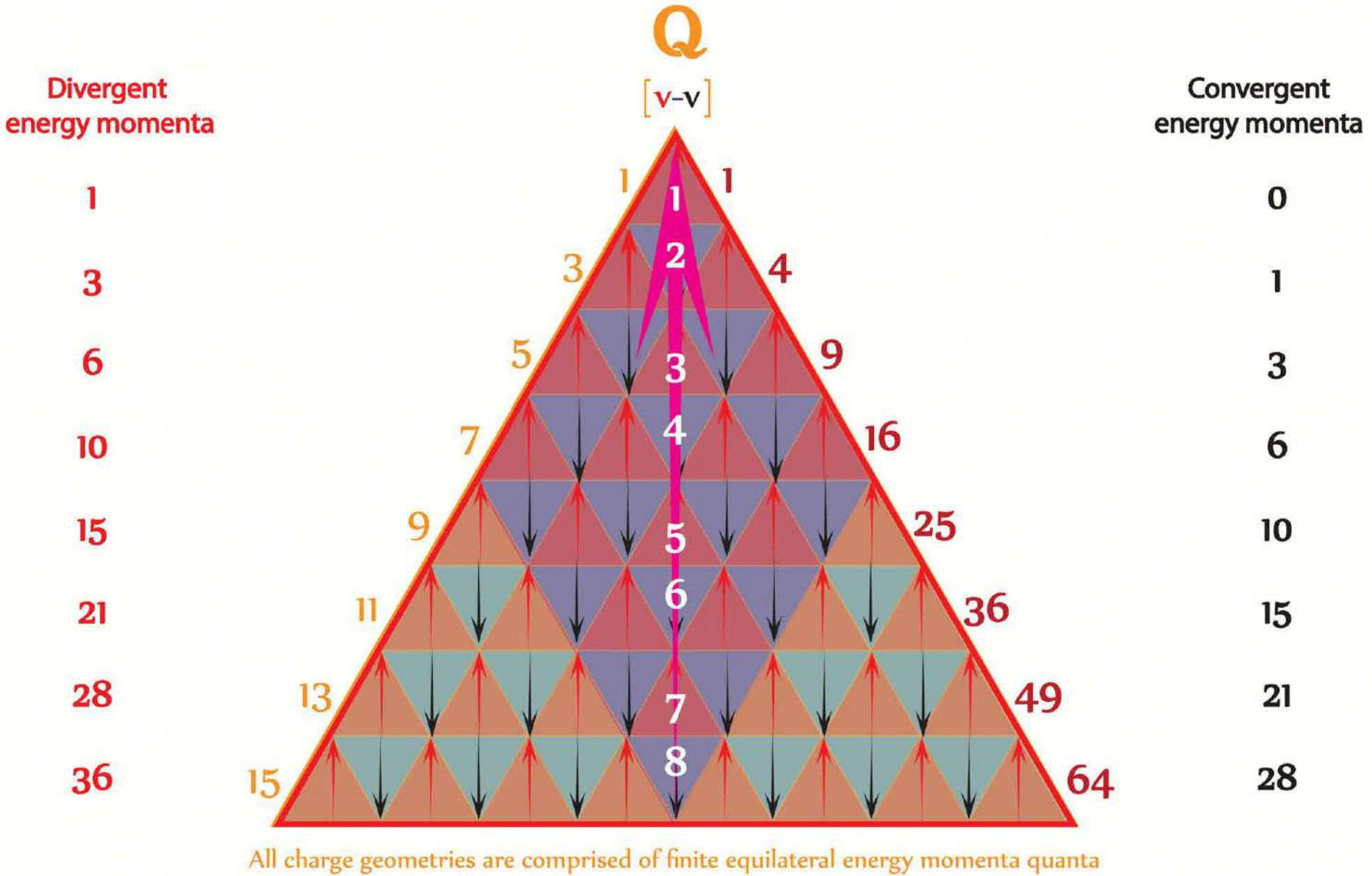
Charged geometries

All charge geometries are nett divergent



All charge geometries are comprised of finite equilateral energy momenta quanta

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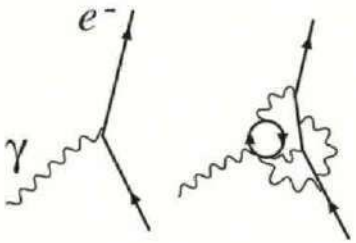
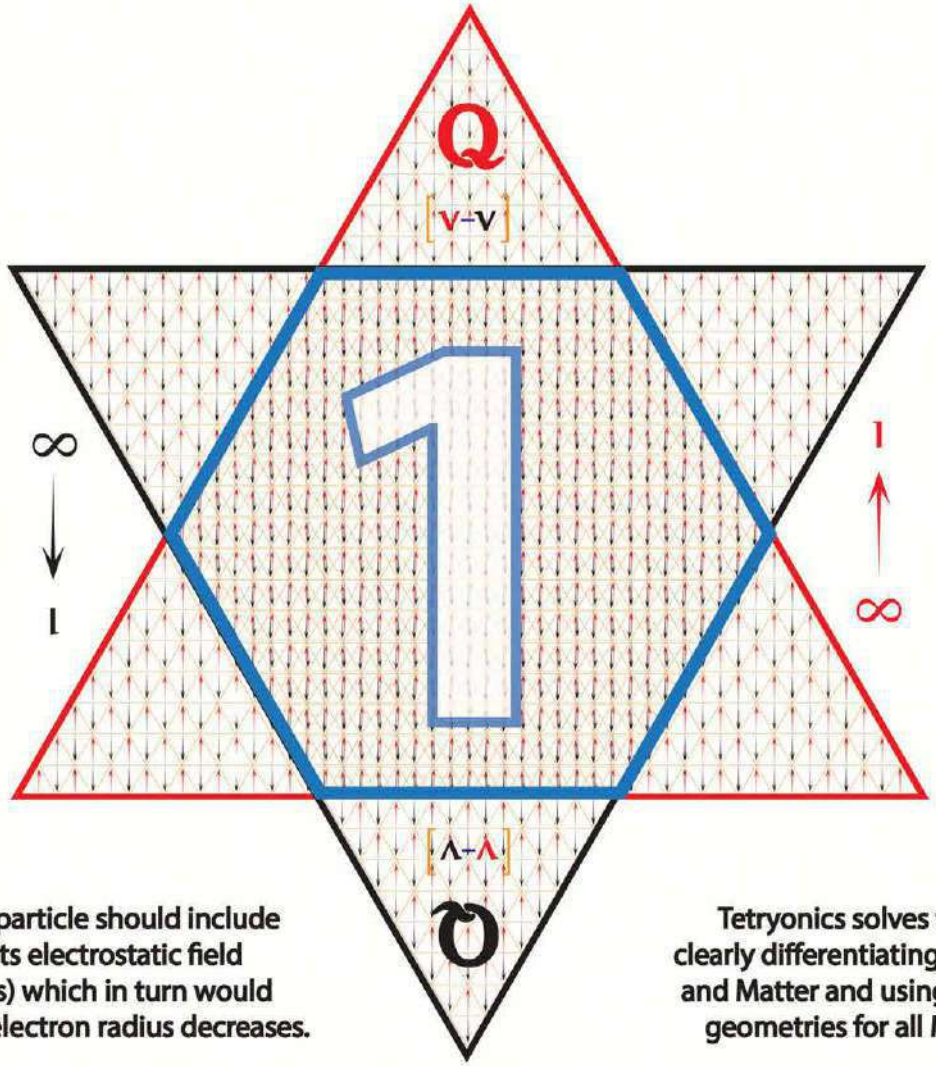
Renormalisation

Renormalization was first developed in quantum electrodynamics (QED) to make sense of infinite integrals in perturbation theory.
The problem of infinities first arose in the classical electrodynamics of point particles in the19th and later in the calculation of Gravitational fields in General Relativity in the early 20th century.

In QED Infinities must be cancelled





In Tetryonics Infinities do not exist

The mass of a charged particle should include the mass-energy in its electrostatic field (Electromagnetic mass) which in turn would approach infinity as the electron radius decreases.

Tetryonics solves the problem by clearly differentiating between EM mass and Matter and using finite equilateral geometries for all Matter in motion

Initially viewed as a suspicious provisional procedure by some of its originators, renormalization was eventually embraced as an important and self-consistent tool in several fields of physics and mathematics.

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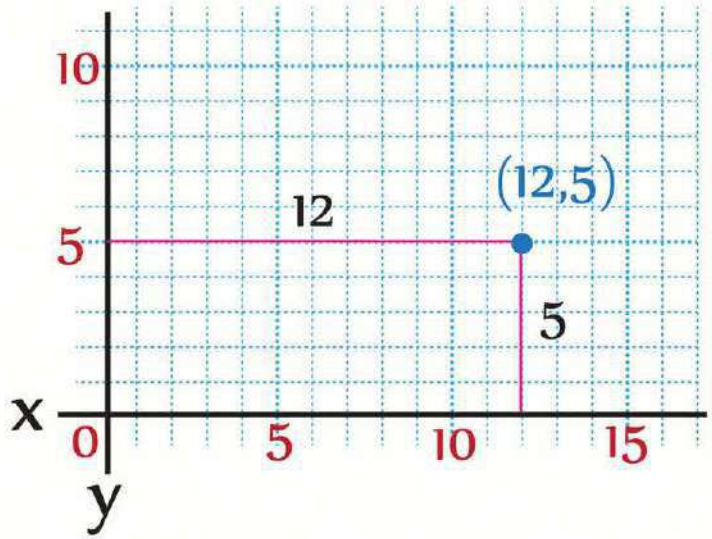
2D space [c^2]

The adjective Cartesian refers to the French mathematician and philosopher René Descartes who developed the coordinate system in 1637

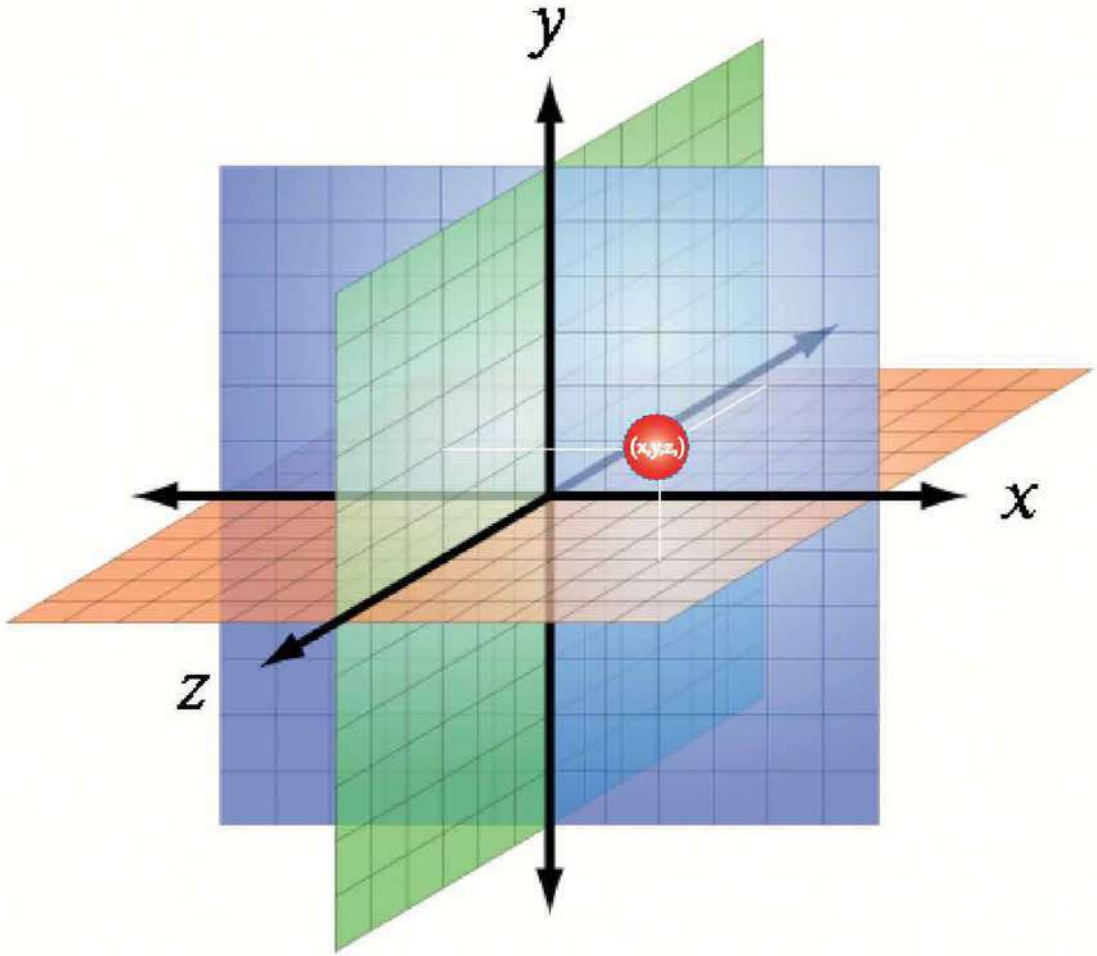
Since then many other coordinate systems have been developed such as the polar coordinates for the plane, and the spherical and cylindrical coordinates for three-dimensional space.



Cartesian coordinates are the foundation of analytic geometry, and provide enlightening geometric interpretations for many other branches of mathematics, such as linear algebra, complex analysis, differential geometry, multivariate calculus, group theory, and more

Mapping 3D spaces using Recti-linear co-ordinates

Cartesian coordinates can be defined as the positions of the perpendicular projections of a point onto the two or more axes, expressed as signed distances from the origin.



3D Cartesian co-ordinate [c^3] systems are distinct from spherical co-ordinate [c^4] systems

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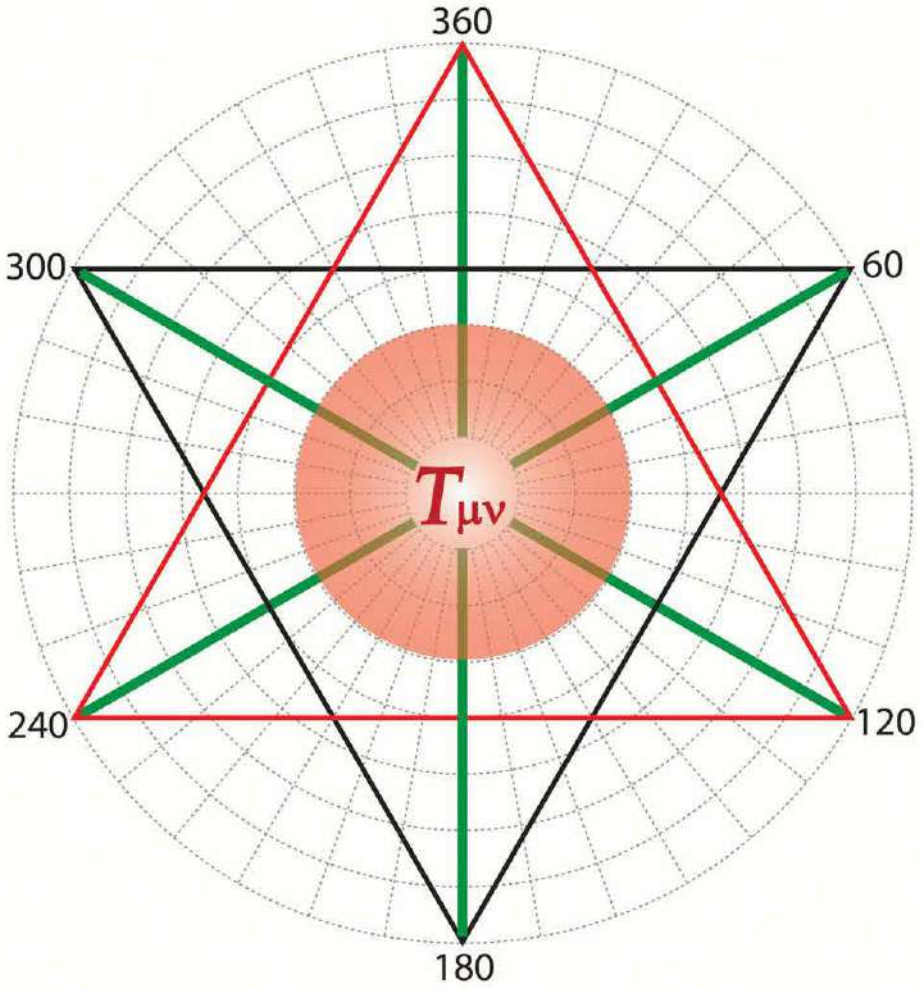
Polar co-ordinates

In mathematics, the polar coordinate system is a two-dimensional co-ordinate system in which each point on a plane is determined by a distance from a fixed point and an angle from a fixed direction.

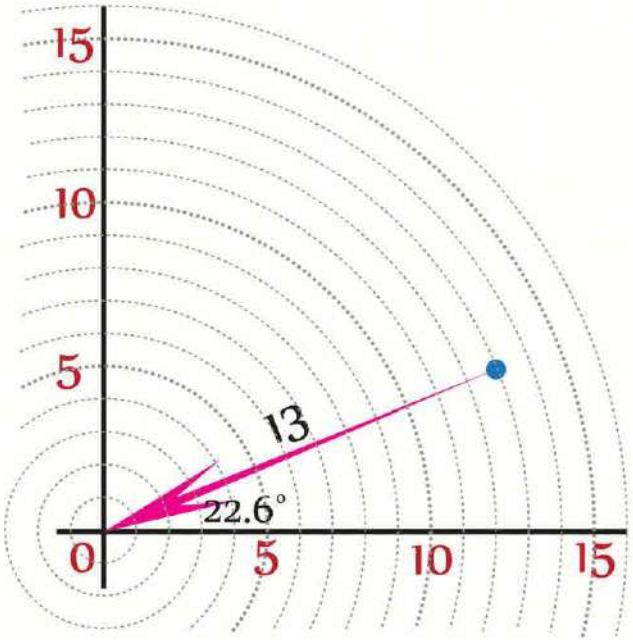


In geometry, curvilinear coordinates are a coordinate system for Euclidean space in which the co-ordinate lines may be curved.

Action Dynamics

Curvilinear co-ordinates may be derived from a set of rectilinear Cartesian coordinates by using a locally invertible transformation that maps one point to another in both systems

Metric Tensors



Gravitational acceleration

Polar or curvilinear co-ordinate systems are used extensively by Einstein in his theory of General Relavtivity

Reimannian curved space-time

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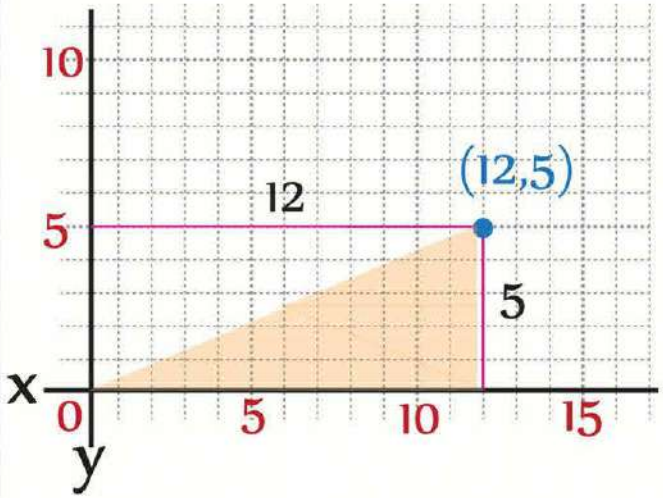
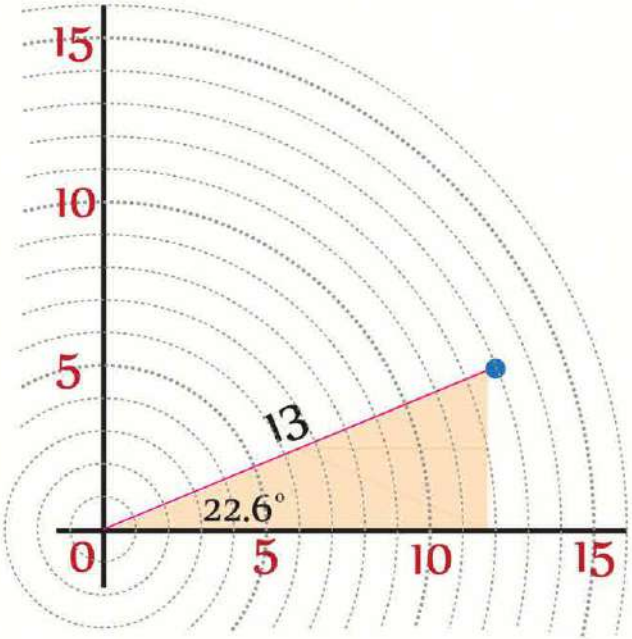
Co-ordinate transformations

There are many different possible coordinate systems for describing geometrical figures and they can all be related to one another.

Such relations are described by coordinate transformations which give formulas for the coordinates in one system in terms of the coordinates in another system



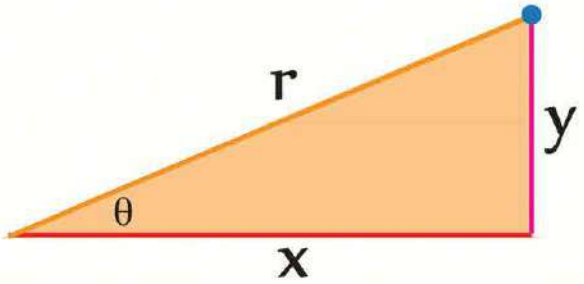
Converting between Polar and Cartesian coordinates



$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$= \tan^{-1}(5/12)$$

$$= 22.619$$



$$r^2 = 12^2 + 5^2$$

$$= \sqrt{169}$$

$$= 13$$

solving for the triangle using trigometric functions

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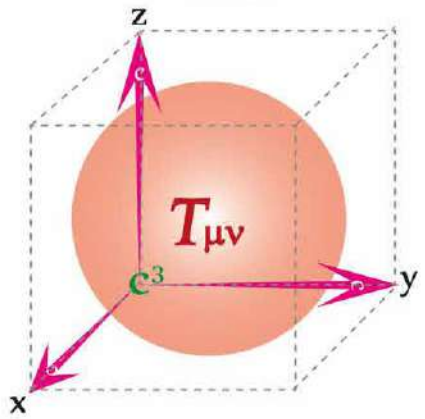
Spatial co-ordinate systems

Cubic

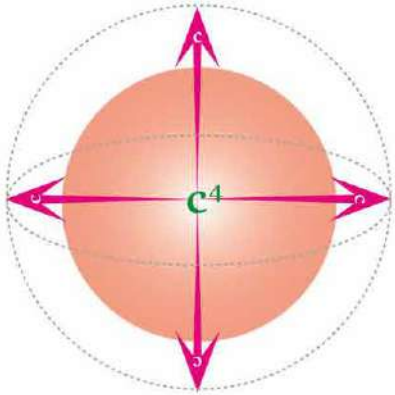


Spacetime is any mathematical co-ordinate system or model that combines space and time into a single continuum.

Spacetime is usually interpreted with space as being three-dimensional with time playing the role of a fourth dimension that is different from the spatial dimensions.

From a Euclidean space perspective, the universe has three spatial dimensions and one dimension of time [reflected by quantised angular momentum].

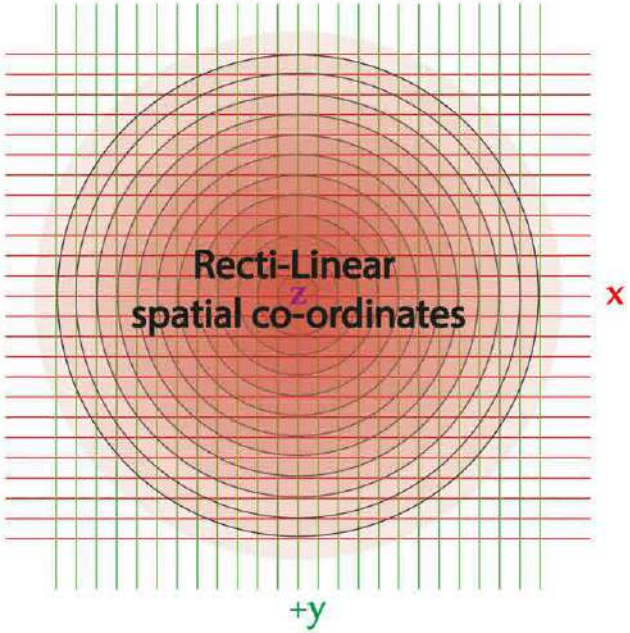
Spherical

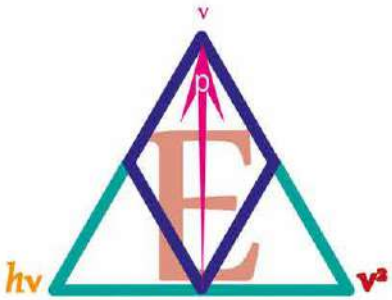


seconds^2

Tetryonics maps spatial co-ordinates through the momenta vectors of equilateral Energy

Cartesian Space-Time

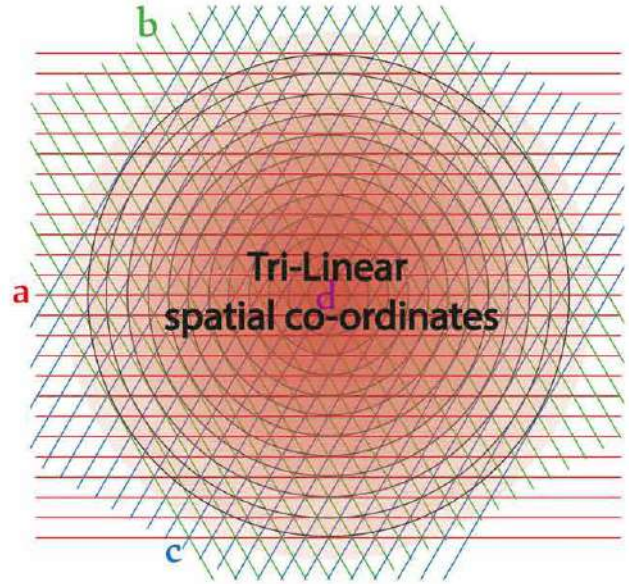




EM mass-ENERGY momenta are equilateral geometries

Mapping equilateral Energy geometries onto recti or curvi-linear spatial co-ordinate systems introduces mathematical complexity to a otherwise simplistic geometry for all EM mass-Energy-Matter interactions

Tetryonic Space-Time



In physics spatial co-ordinates to date have been based on Cartesian co-ordinates when in fact Energy momenta follow a Tri-Linear co-ordinate geometry

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vectors

1 Dimensional velocity

Euclidean

2 Dimensions velocity squared

$$m = \frac{E}{c^2}$$

mass-energy equivalence

mass-Matter

$$\frac{m}{c^2} = M$$

equivalence

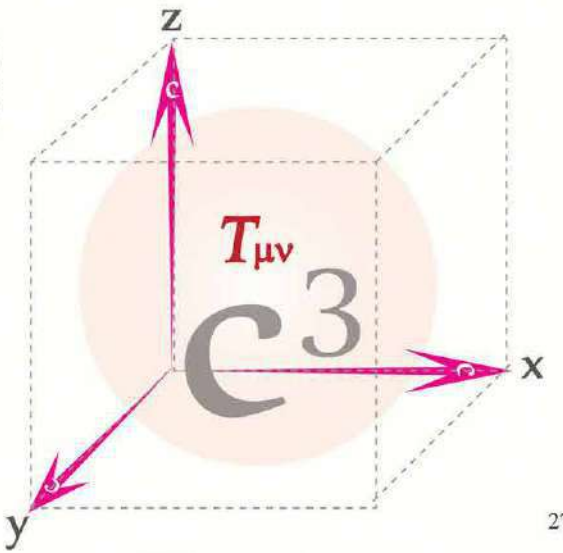
$$T_{\mu\nu}$$

energy-Matter equivalence

$$M = \frac{E}{c^4}$$

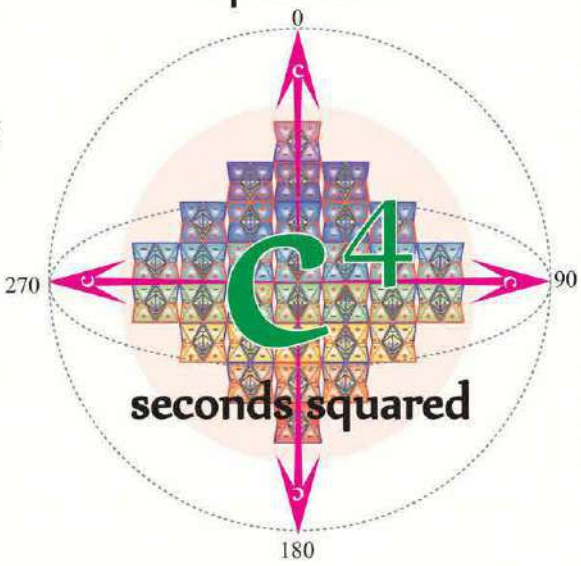
GR fails differentiate betweem EM mass-ENERGY-Matter unlike Tetryonic theory

Cartesian co-ordinates



3 Dimensions velocity cubed

Spherical



3 Dimensions quadrature velocity

Space-time co-ordinates

The propagation of Energy momenta forms distinct spatial co-ordinate systems

Where angles are typically measured in degrees (°) or radians (rad), where 360° = 2π rad = τ radians.

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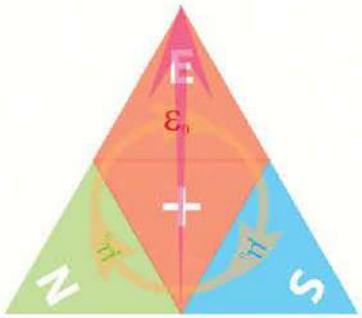
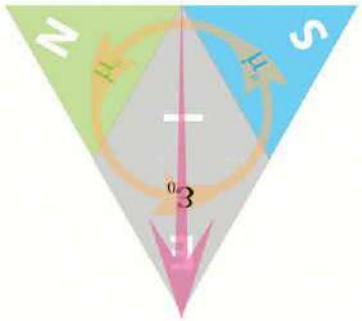
Tetryonic co-ordinate systems

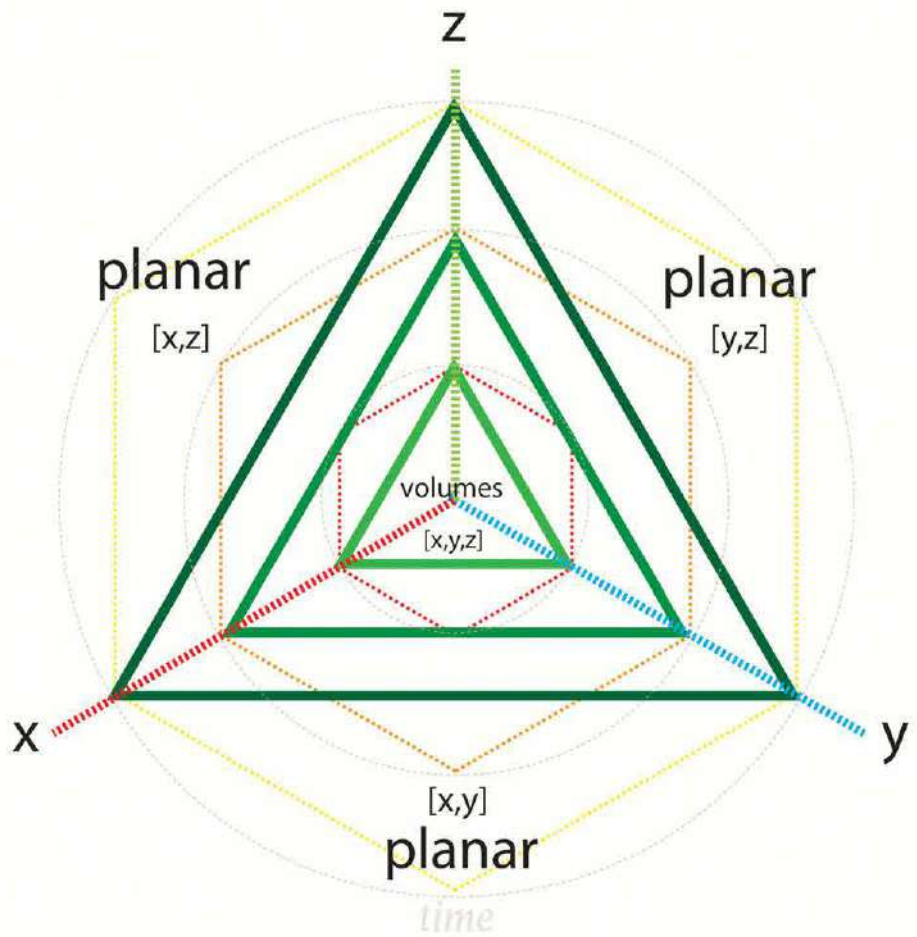
Energy per second

m



2D mass-energy geometries





Energy per second squared

M

Proton

3D Matter topologies

Neutron

Planar mass-energy geometries have no z-components

Differentiation between 2D mass-energy & 3D Matter is key to extending our understanding of physics

Matter topologies have z-components

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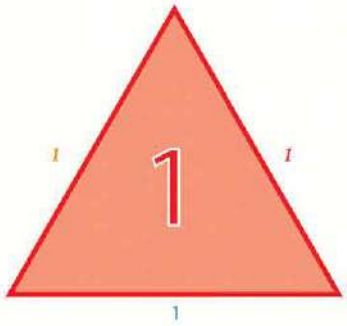
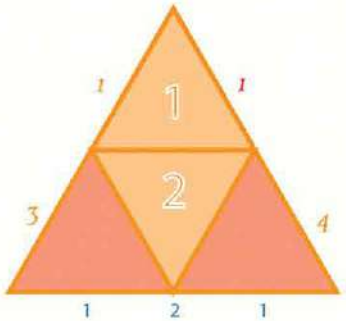
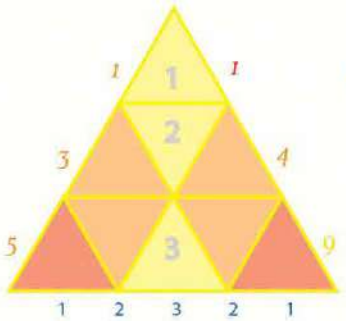
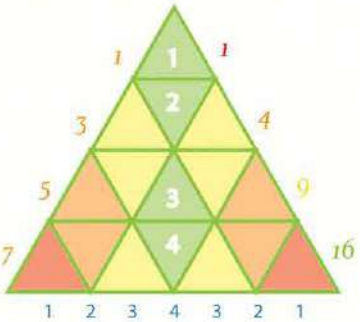
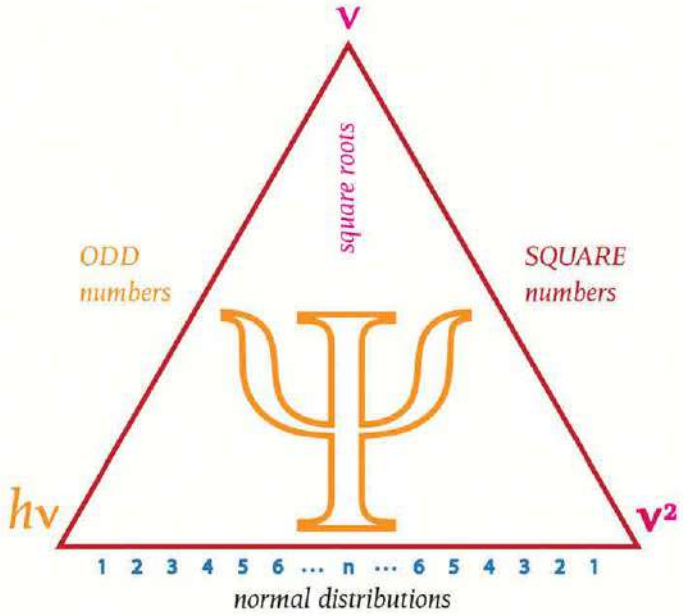




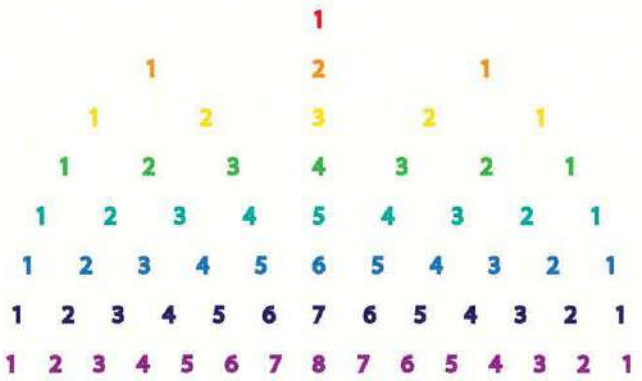




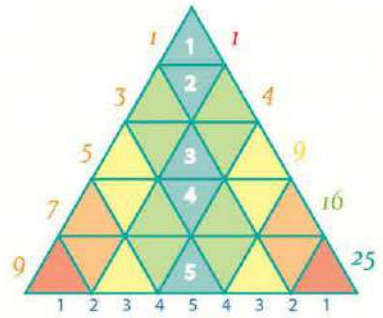


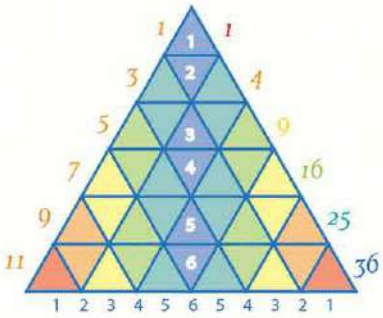
Quantum probability distributions

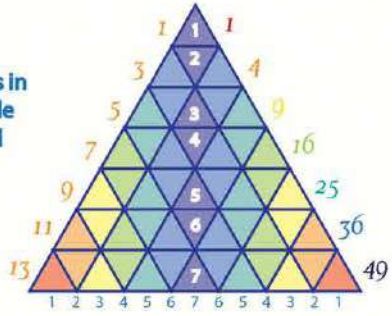
The equilateral geometry and distribution of quantised Energy momenta provides the basis for all statistical probabilities in Quantum mechanics, thermodynamic & Information entropy - including a solution to Heisenberg's Uncertainty Principle thus paving the way forward for a new understanding, and manipulation of physical phenomena at the quantum level

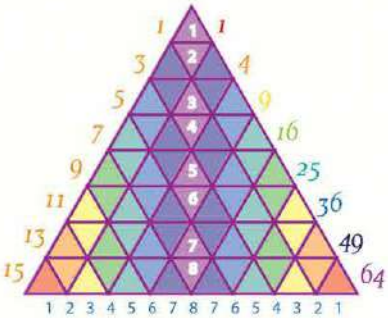


Normal distributions are extremely important in statistics, and are often used in the natural and social sciences for real-valued random variables whose distributions are not known









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Quantum Probability Distributions

The normal distribution is a probability distribution.
It is also called Gaussian distribution because it was discovered by Carl Friedrich Gauss.

x/n^2

Probabilities are the square of the Amplitude

n

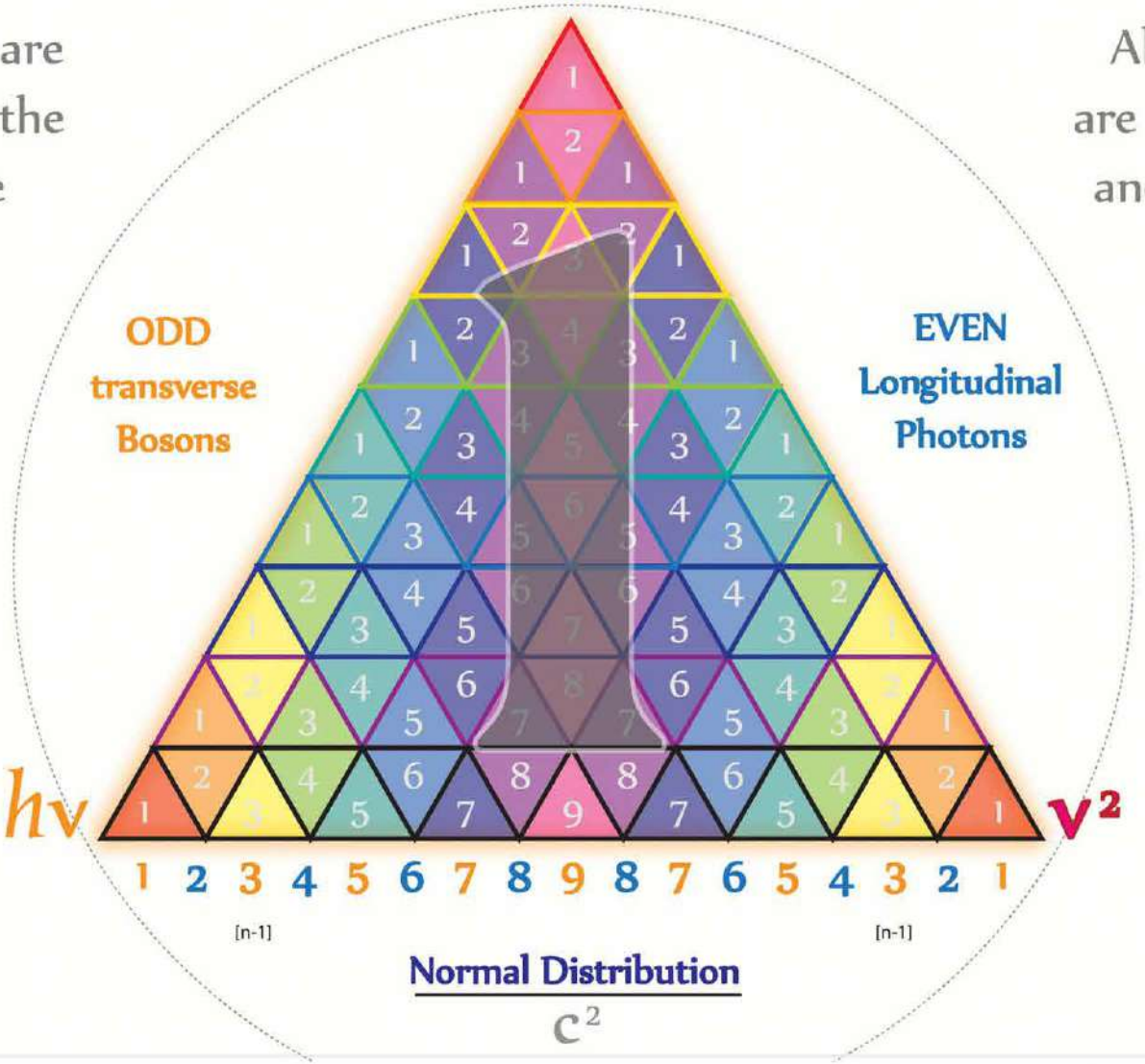
square root momenta

v

$\Sigma\ x/n^2$

All probabilities are re-normalisable and sum to Unity

1



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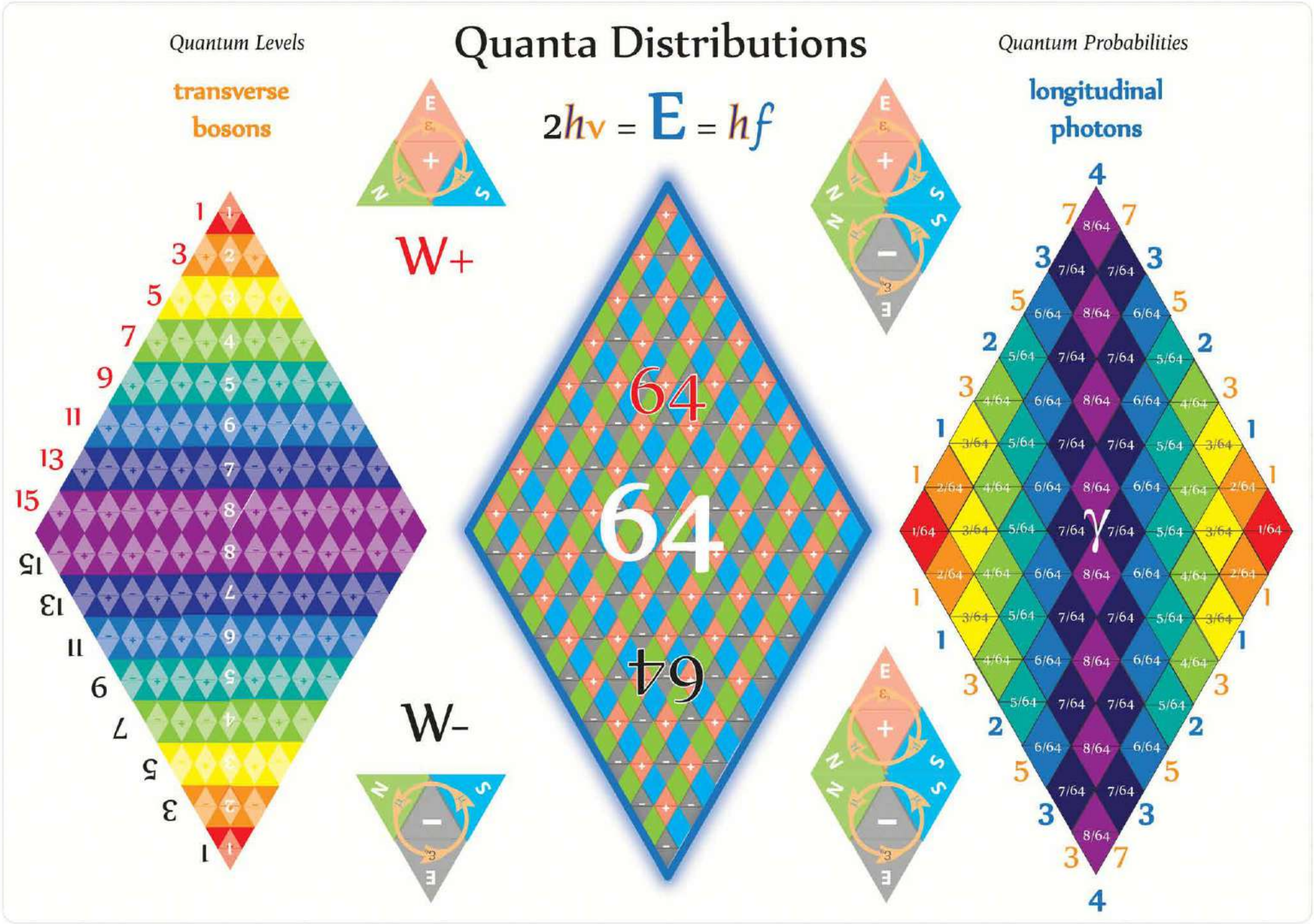

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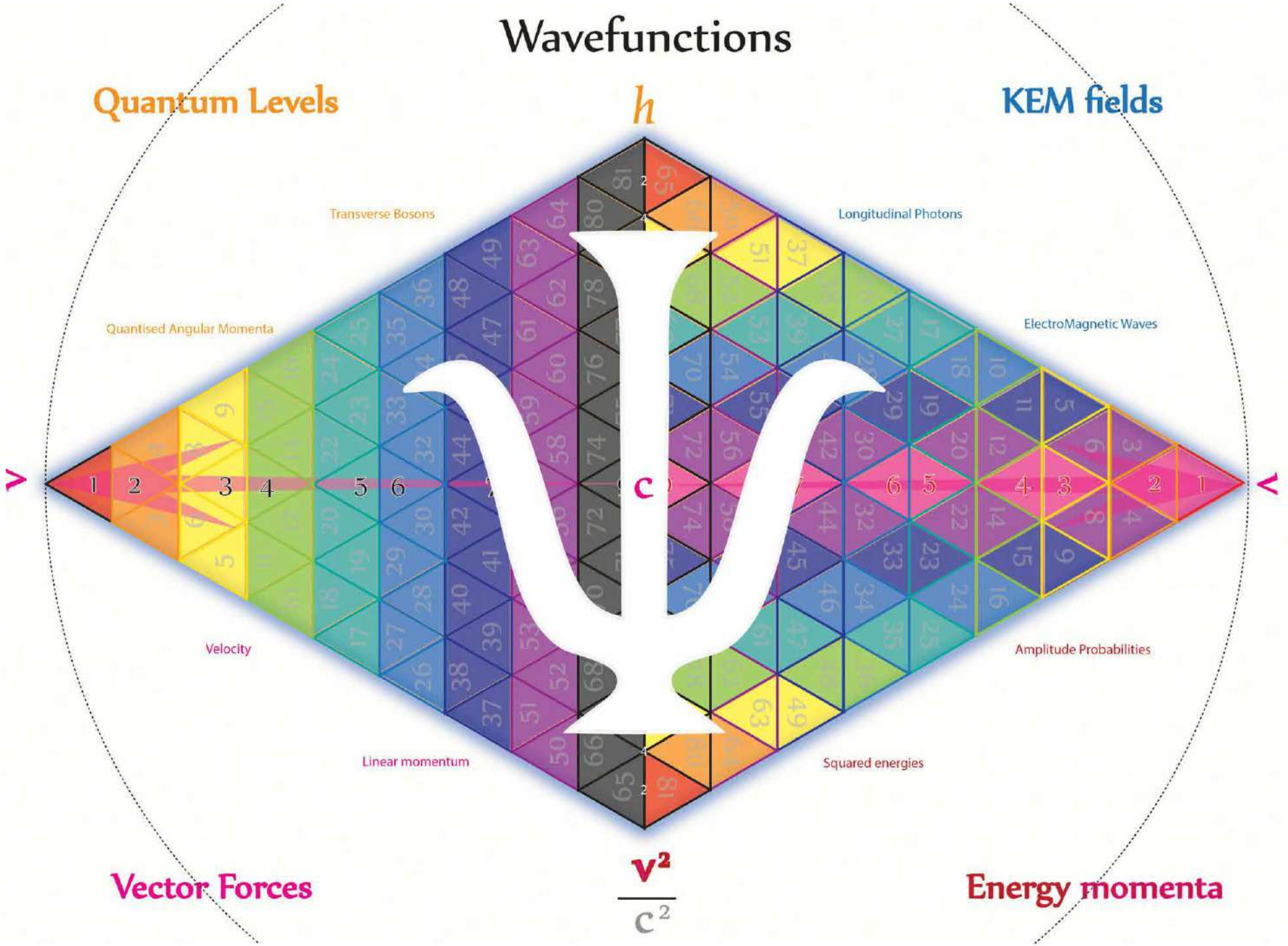
Wavefunctions



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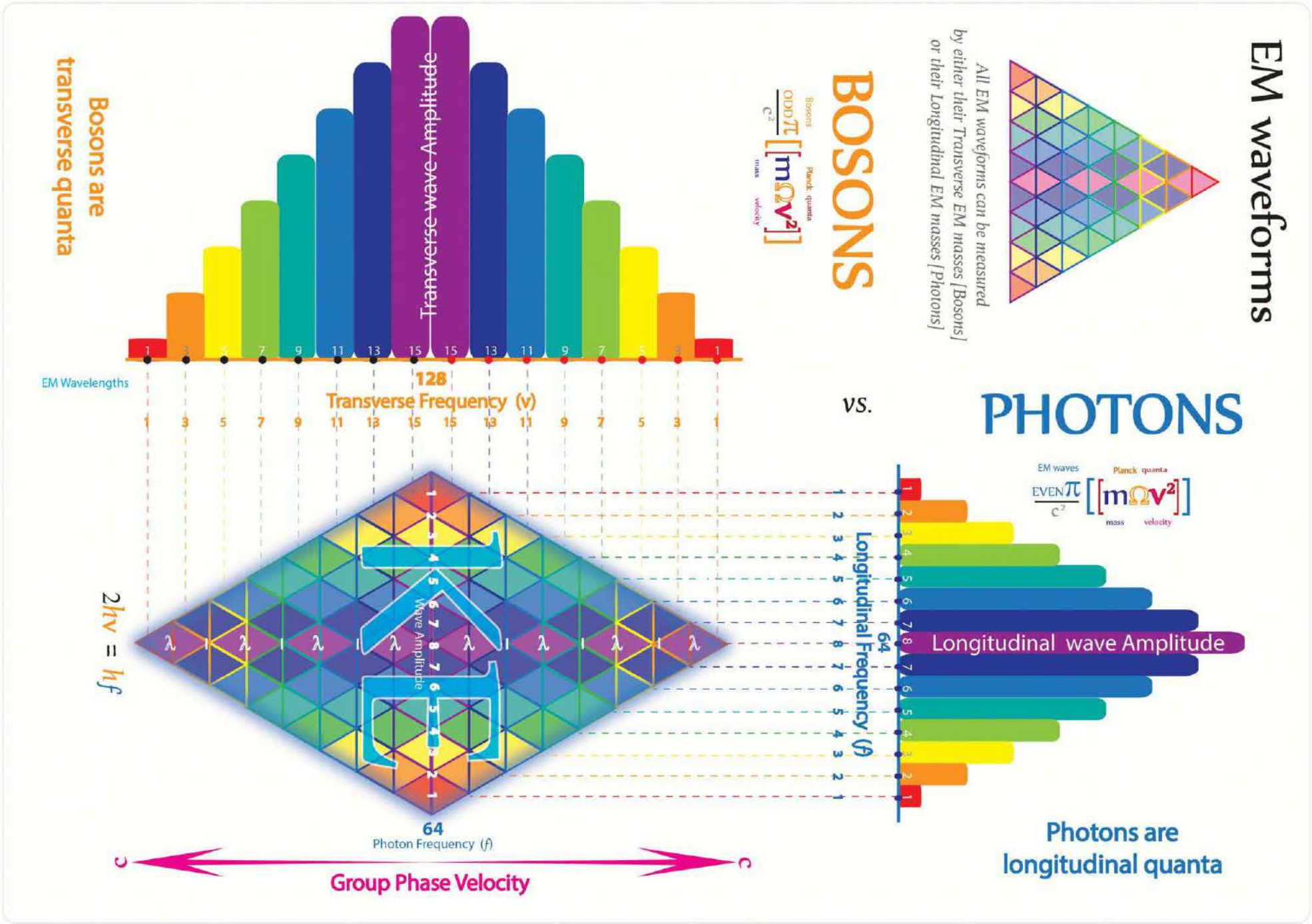

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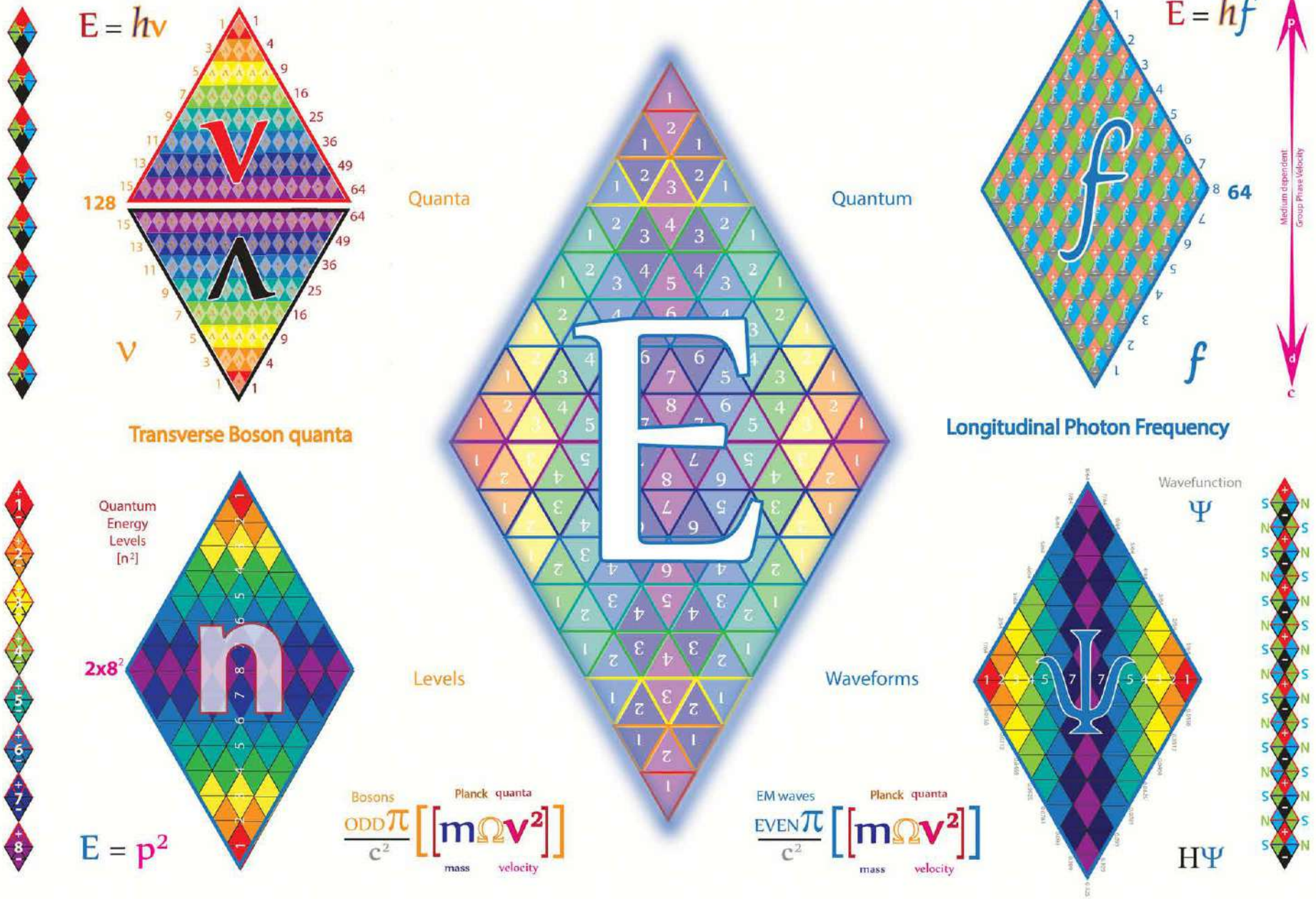
Quantum Energy distributions



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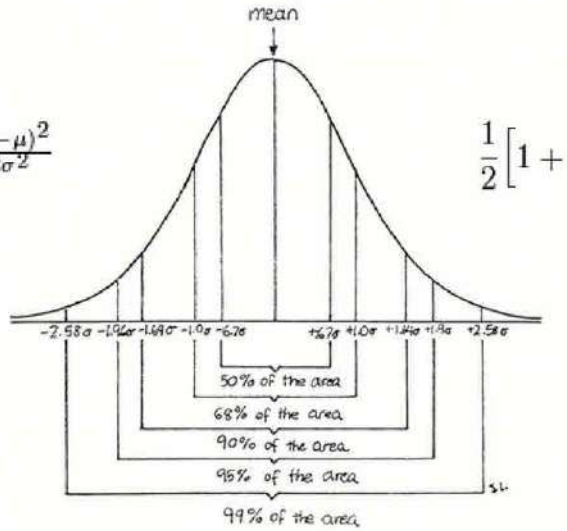
Normal Distributions

The Gaussian distribution sometimes informally called the bell curve.

Pierre de Fermat

Pierre de Fermat is given credit for early developments that led to infinitesimal calculus.

$$\frac{1}{\sqrt{2\pi\sigma^2}}\, e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$



$$\frac{1}{2}\left[1 + \operatorname{erf}\left(\frac{x-\mu}{\sqrt{2\sigma^2}}\right)\right]$$

Leonhard Euler

Leonhard Euler developed a formula which links complex exponentiation with trigonometric functions

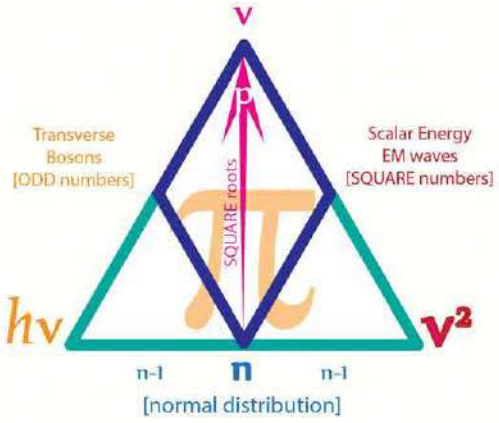
A bell shaped curve defines the standard normal distribution, in which the probability of observing a point is greatest near the average, and declines rapidly as one moves away from the mean.

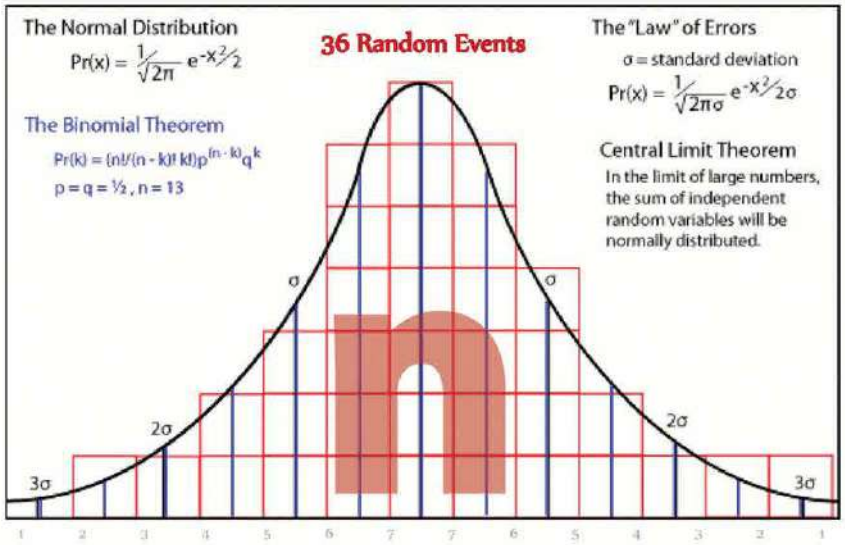
all ODD numbers are

$$a^2 - b^2 = [a-b].[a+b]$$

the difference of two squares

$$e^{i\pi} = -1$$




The Normal Distribution
Pr(x) = 1/√2π e^-x²/2
36 Random Events
The "Law" of Errors
σ = standard deviation
Pr(x) = 1/√2πσ e^-x²/2σ
The Binomial Theorem
Pr(k) = (n!/(n - k)! k!)p^(n-k)q^k
p = q = ½, n = 13
Central Limit Theorem
In the limit of large numbers, the sum of independent random variables will be normally distributed.
σ
2σ
3σ

In probability theory, the normal (or Gaussian) distribution is a continuous probability distribution that has a bell-shaped probability density function, known as the Gaussian function

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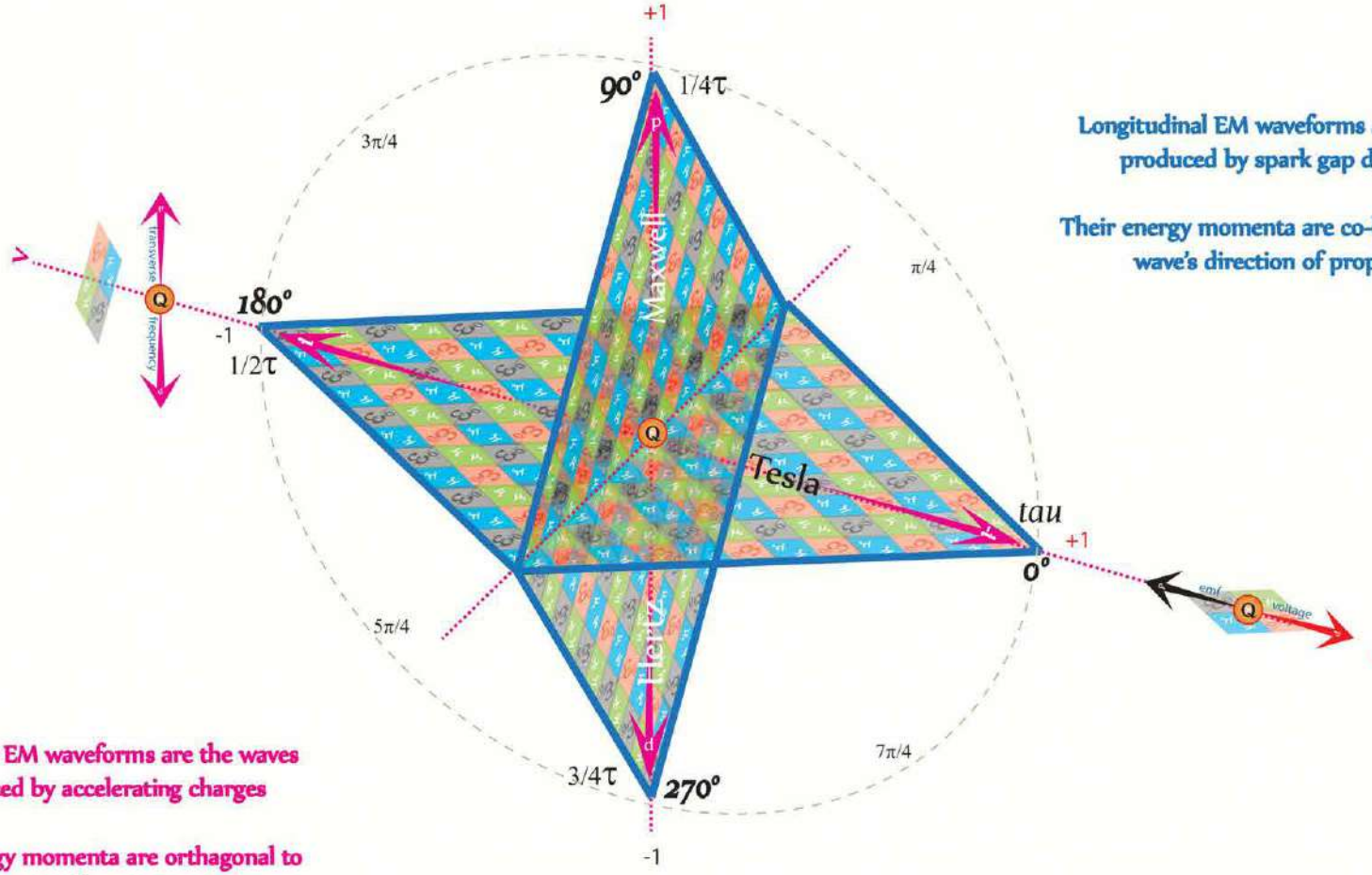
Fundamental theorem of Energy momenta

A nth level scalar energy momenta waveform has exactly n linear momentum in unit circle co-ordinate systems
(with Longitudinal and Transverse equilateral Planck waveforms being orthogonal to each other)

scalar energies

E

mv^2



Longitudinal EM waveforms are the waves produced by spark gap discharges

Their energy momenta are co-linear with the wave's direction of propagation

Transverse EM waveforms are the waves produced by accelerating charges

Their energy momenta are orthagonal to the direction of wave propagation

p

mv

linear momentum

[Mathematics] i or j [Electrical theory]

square root of negative one

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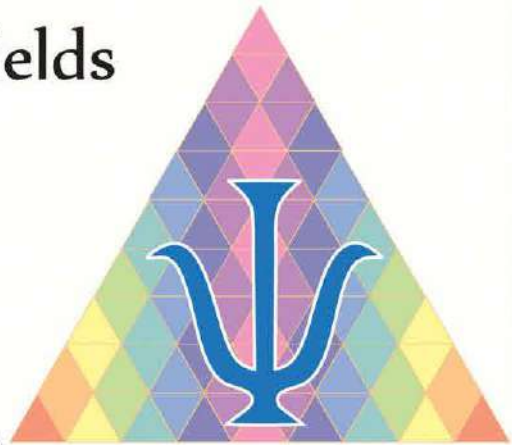
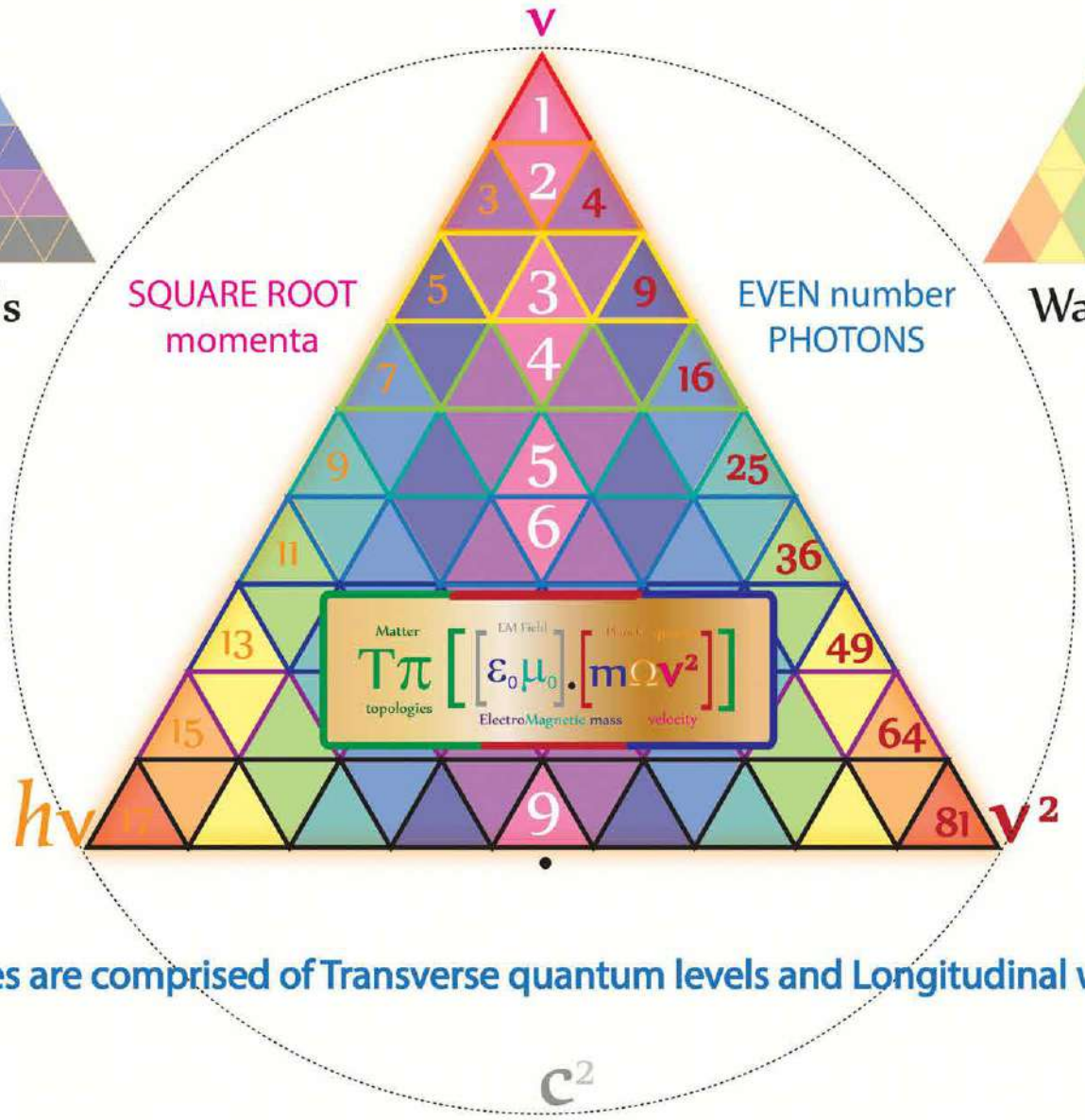
Velocity and Time dependent EM fields

Quantum levels



Wave probabilities



SQUARE ROOT momenta

EVEN number PHOTONS

ODD number BOSONS

SQUARE number ENERGIES

All EM geometries are comprised of Transverse quantum levels and Longitudinal wave probabilities

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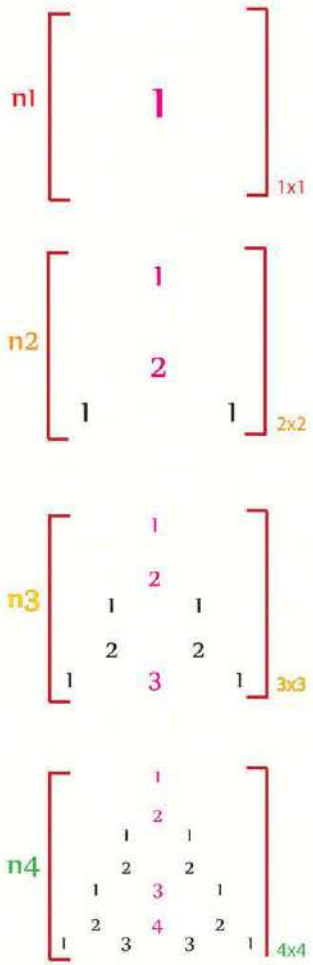
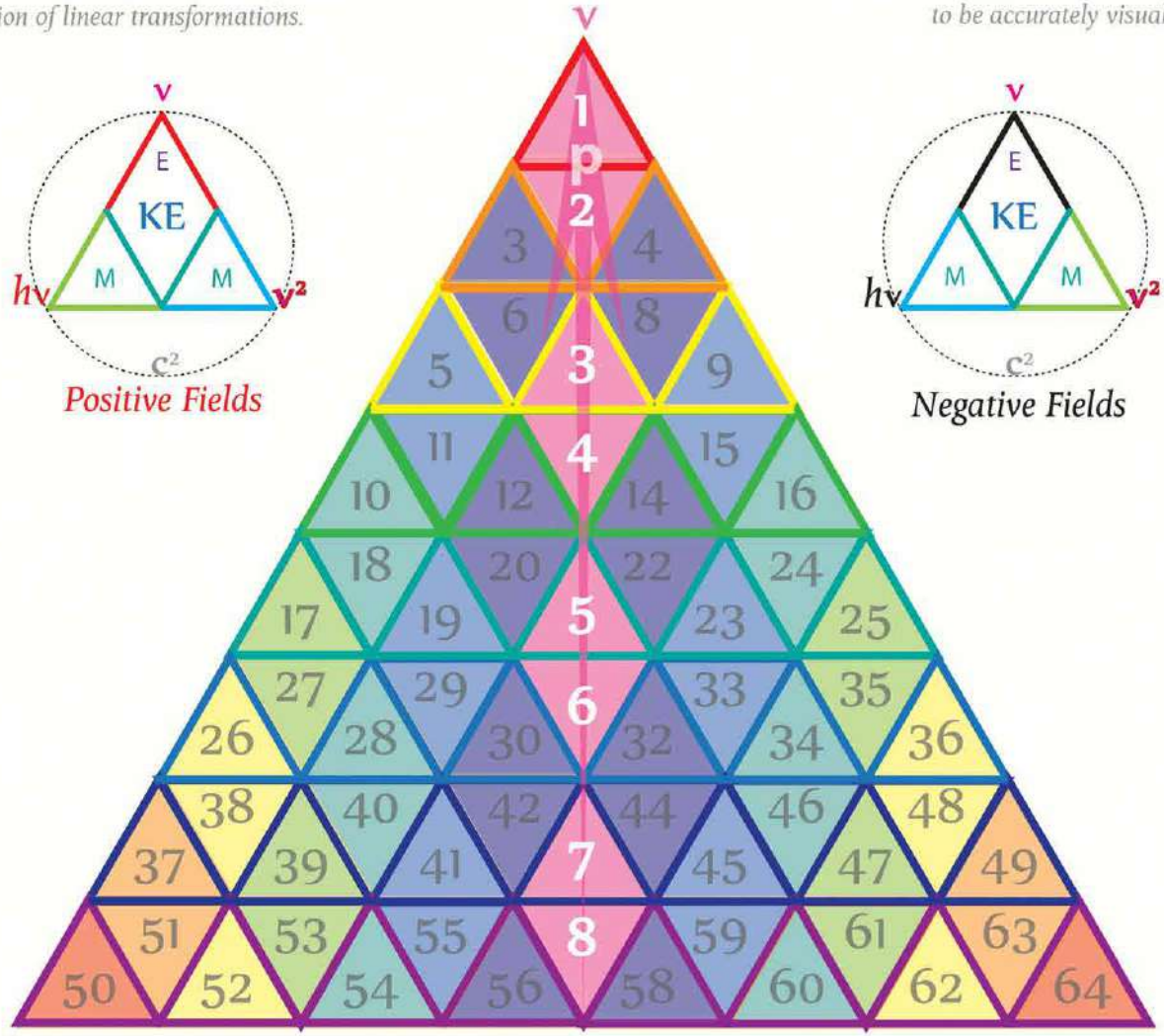
Matrices

Matrices are a key tool in linear algebra. One use of matrices is to represent linear transformations, which are higher-dimensional analogs of linear functions of the form f(x) = cx, where c is a constant; matrix multiplication corresponds to composition of linear transformations.

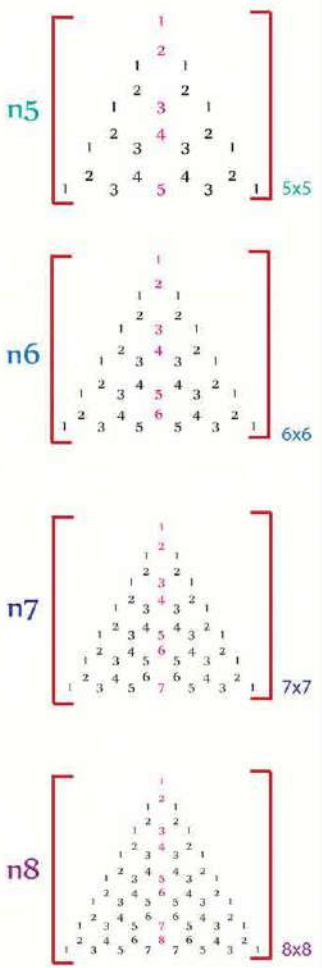
Further developing equilateral Matrices and tensor mathematics to reflect the 2D geometry of EM , KEM and GEM quantum fields, along with the geometric quantisation of mass-energiy momenta and their energy distributions allows for field interactions to be accurately visualised and modelled



Positive Fields



Negative Fields



Tensors are geometric entities introduced into mathematics and physics to extend the notion of scalars, geometric vectors, and matrices to increasingly higher orders.

Modifying Square matrices to reflect the equialteral geometries of Tetryonic fields allows for the accurate geometric modelling of all Scalar & Vector fields along with their varied intrinsic quantum energies and physical properties

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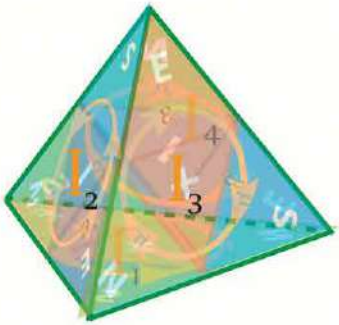
Energy momenta Tensors

momenta
(a property of Energy)
is converative



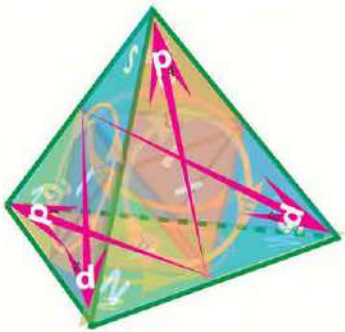
$p_M \rightarrow (E, p1, p2, p3, p4).$

All standing-wave Matter topologies can be modelled using its Tetryonic charge energy momenta Tensors

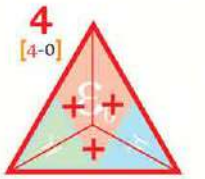
with an additional Kinetic EM energy-momenta tensor required for Matter in motion

$p_{KEM} \rightarrow (E, p5).$

Matter
(a geometric property)
is NOT conservative



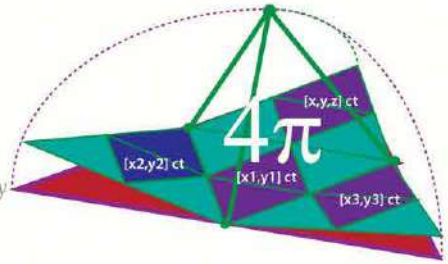
2D+1 [SR] mass-energy momenta can be folded into 3D+1 [GR] Matter
that can be modelled using 4 Energy-momenta tensors



Positive standing-wave
Matter

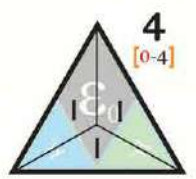
$E = \sum_{\text{all fascia}} E$

Energy of a massive particle is the total of all Planck quanta (compton frequency) in a 3D geometry



$\vec{p} = \sum_{\text{all fascia}} \vec{p}$

Total Momentum is the total of all quanta linear Momenta in a 3D particle



Negative standing-wave
Matter

Relativistic Matter
in motion

$I = \sum_{\text{all fascia}} I$

Inertial mass is the total of all inertia in a 3D particle

Photons have null energy-momentum tensors

Note that both 2D mass-energies [Special Relativity] and 3D Matter [General Relativity] have distinct Energy momenta

It is the 3D Tetrahedral topologies that provides a definative basis for Matter

Relativistic Matter
in motion

Tetryonic Energy momenta tensors should not be confused with Four vector tensors which map energy-momenta vectors in 3D spatial[cartesian] co-ordinate systems

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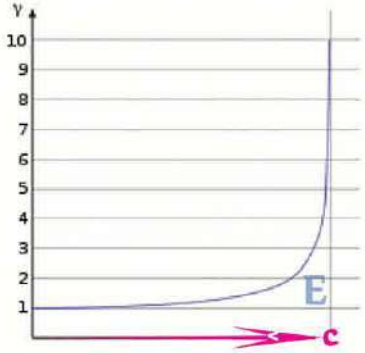
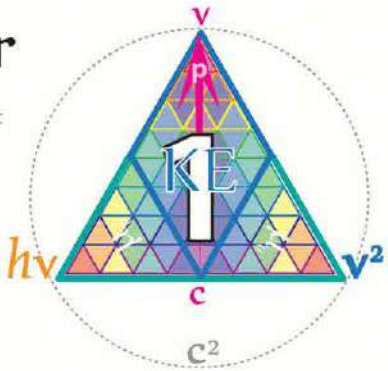


Relativistic Lorentz correction factor

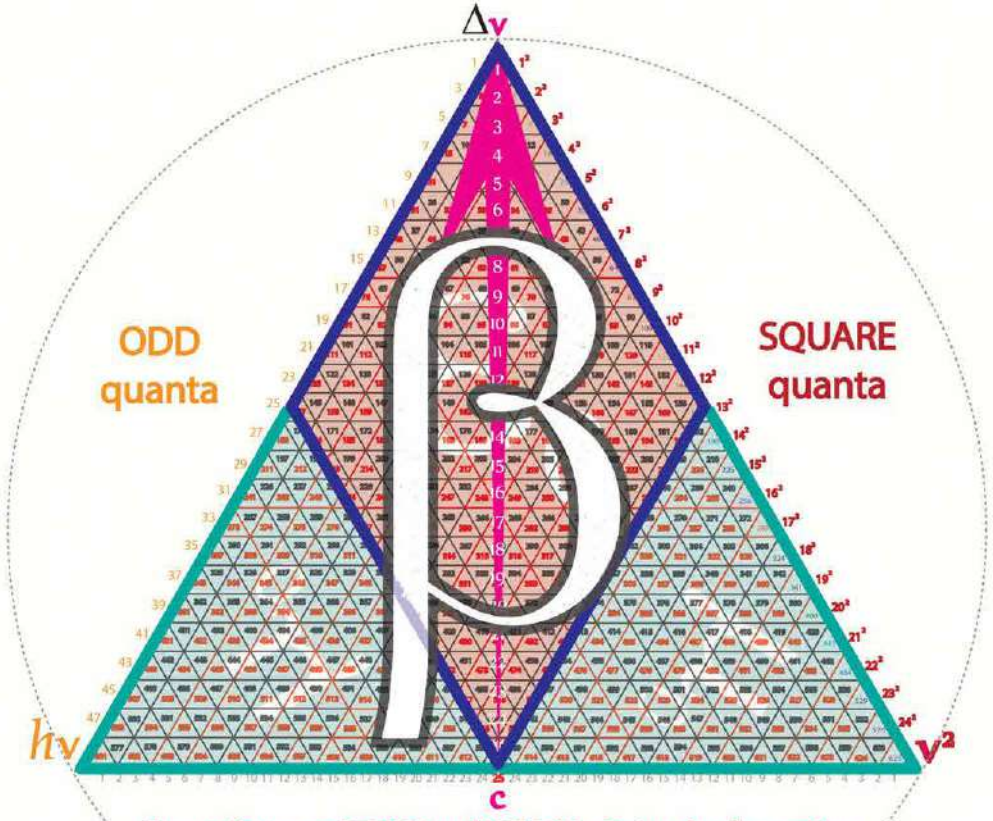
The Lorentz factor or Lorentz term is an expression which appears in several equations in special relativity
It is often incorrectly graphed (as pictured to the right) as an increasing function of velocity approaching but never reaching c

'c' is the maximum velocity achelvable through the electrical acceleration of particles is NOT the maximum velocity possible for Matter in motion



Linear correction factor

$$\beta = \left[\frac{v}{c}\right]$$



Scalar correction factor

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

$$\Delta\frac{\gamma}{c^2}$$ Wavelength contraction

Lorentz factors are LINEAR and SCALAR velocity related corrections to the relativistic mass-energy momenta content of any physical system accelerated by EM Forces

$$\frac{\Gamma}{c^2}$$ Lorentz corrections

Time Dilation $$\Delta\frac{\Omega}{c^2}$$

$$\Delta\frac{mv}{c^2}$$ Relativistic momentum

Relativistic mass-energy $$\Delta\frac{h\nu}{c^2}$$

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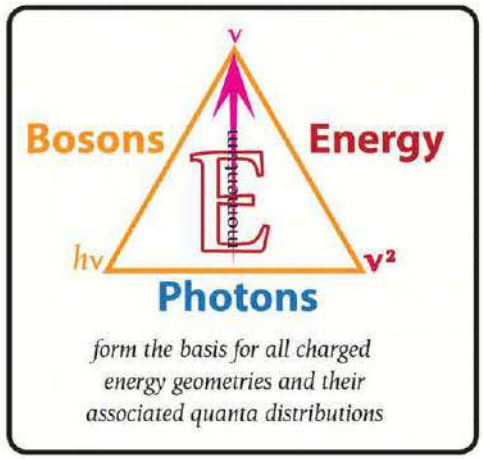
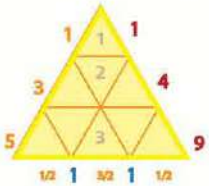
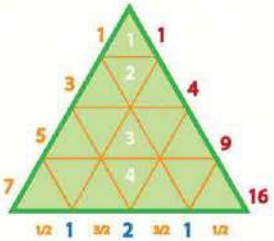
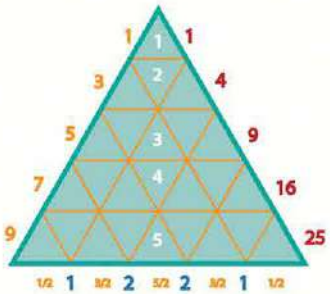


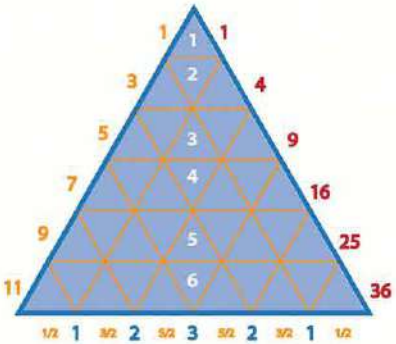
Equilateral energies

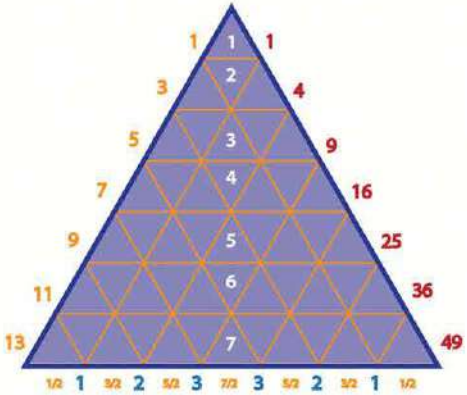
Any measurements of mass without a Space-Time co-ordinate system are measurements of Energy

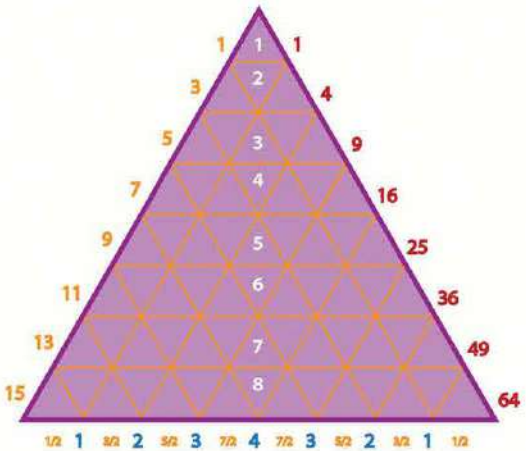


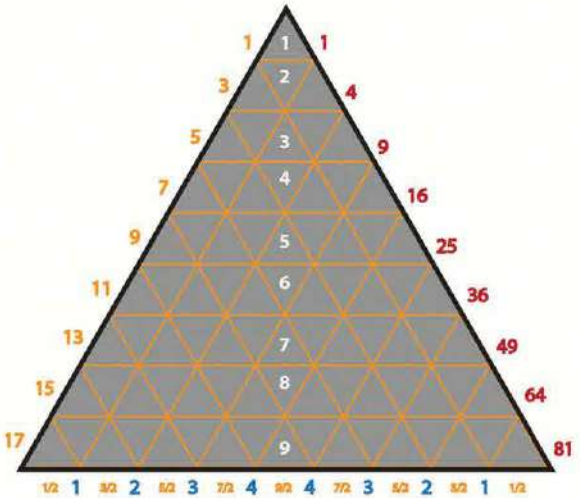












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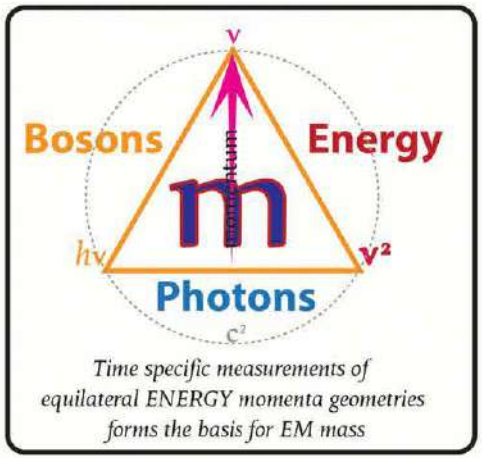
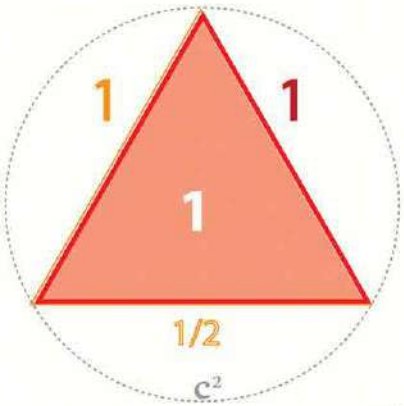
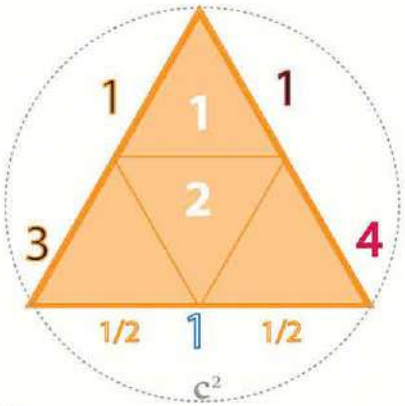


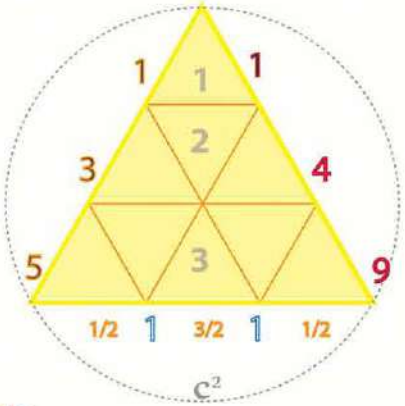
Time specific measurements of equilateral ENERGY momenta geometries forms the basis for EM mass

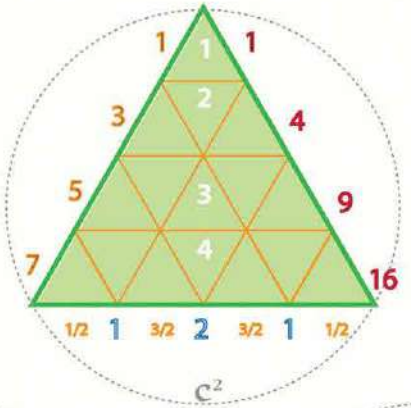
Electromagnetic mass

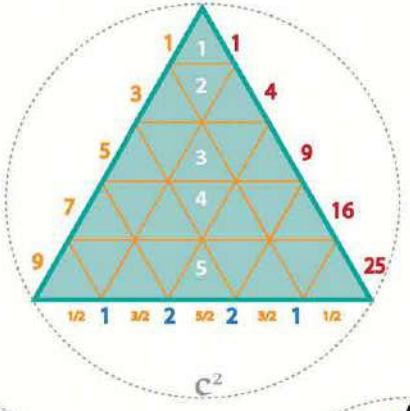
2D mass-energy is the surface integral of 3D Matter

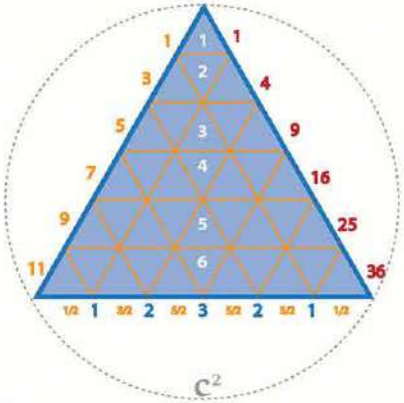


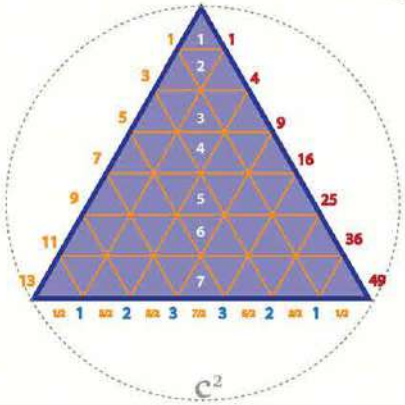


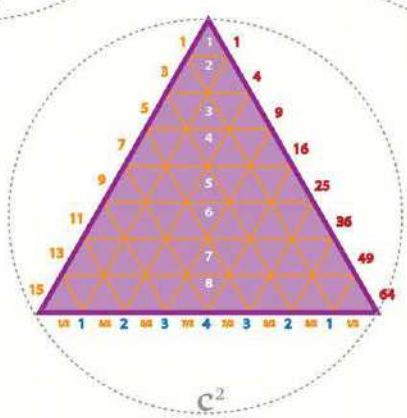


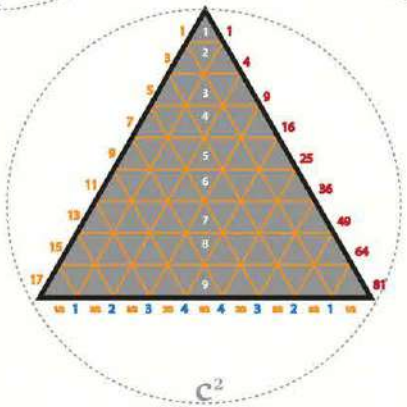












mass-less particles is a physical misnomer

All measurements of energy in spatial co-ordinate systems are measurements of mass

Matter-less is the appropriate terminology

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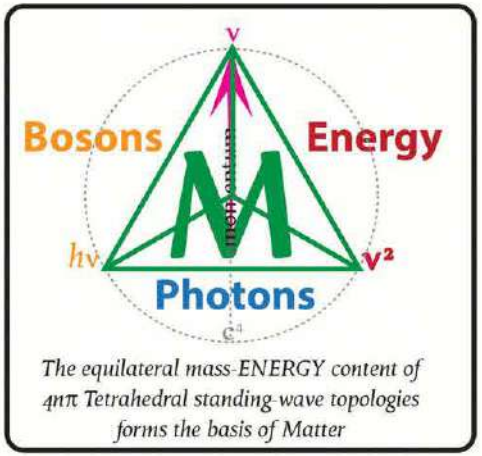
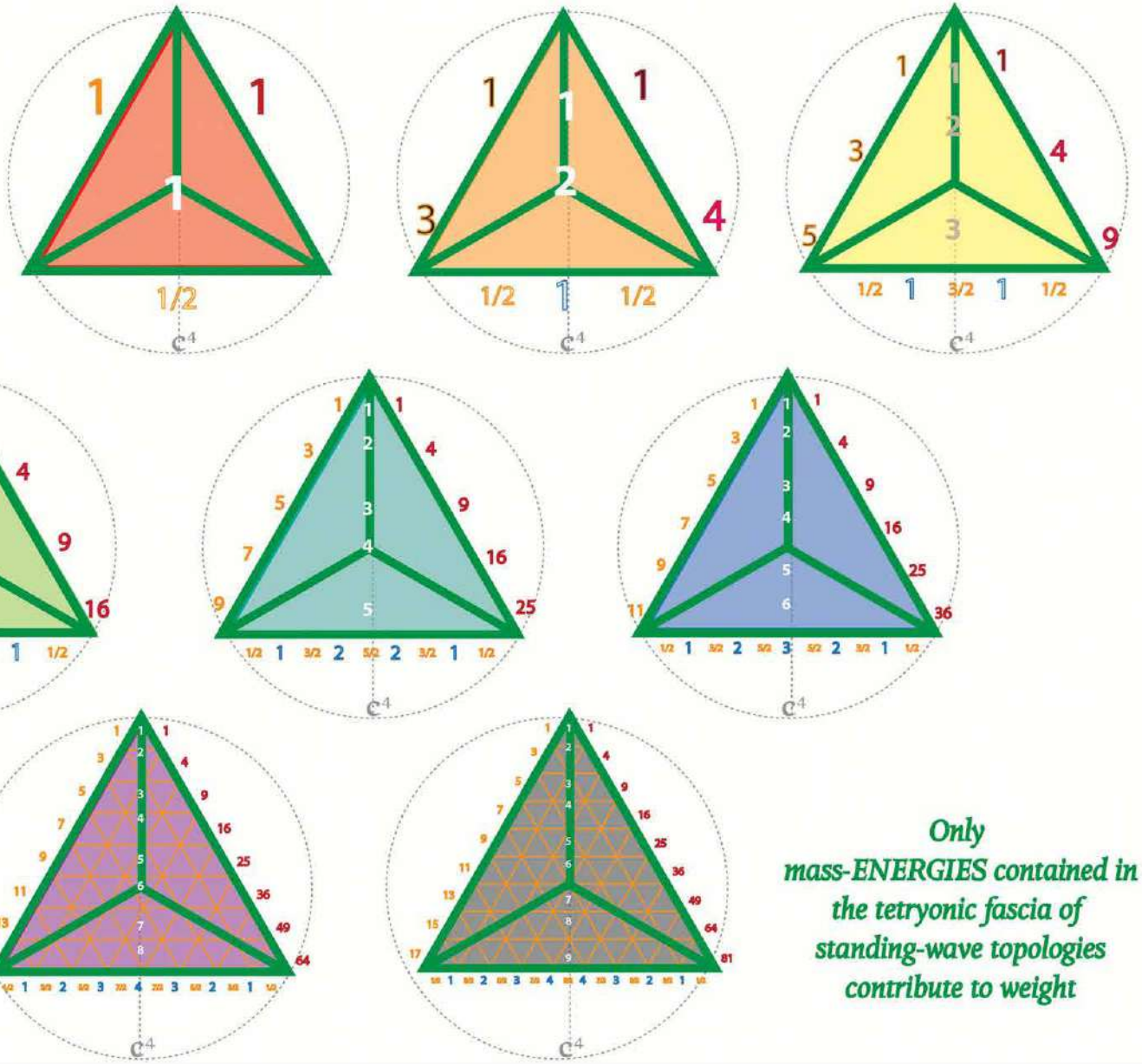
Standing-wave Matter

Matter is a higher order 3D topology created by standing wave mass-energies



The equilateral mass-ENERGY content of 4nπ Tetrahedral standing-wave topologies forms the basis of Matter



Only mass-ENERGIES contained in the tetryonic fascia of standing-wave topologies contribute to weight

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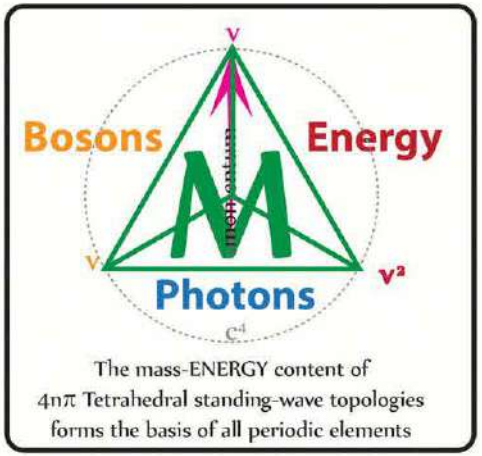
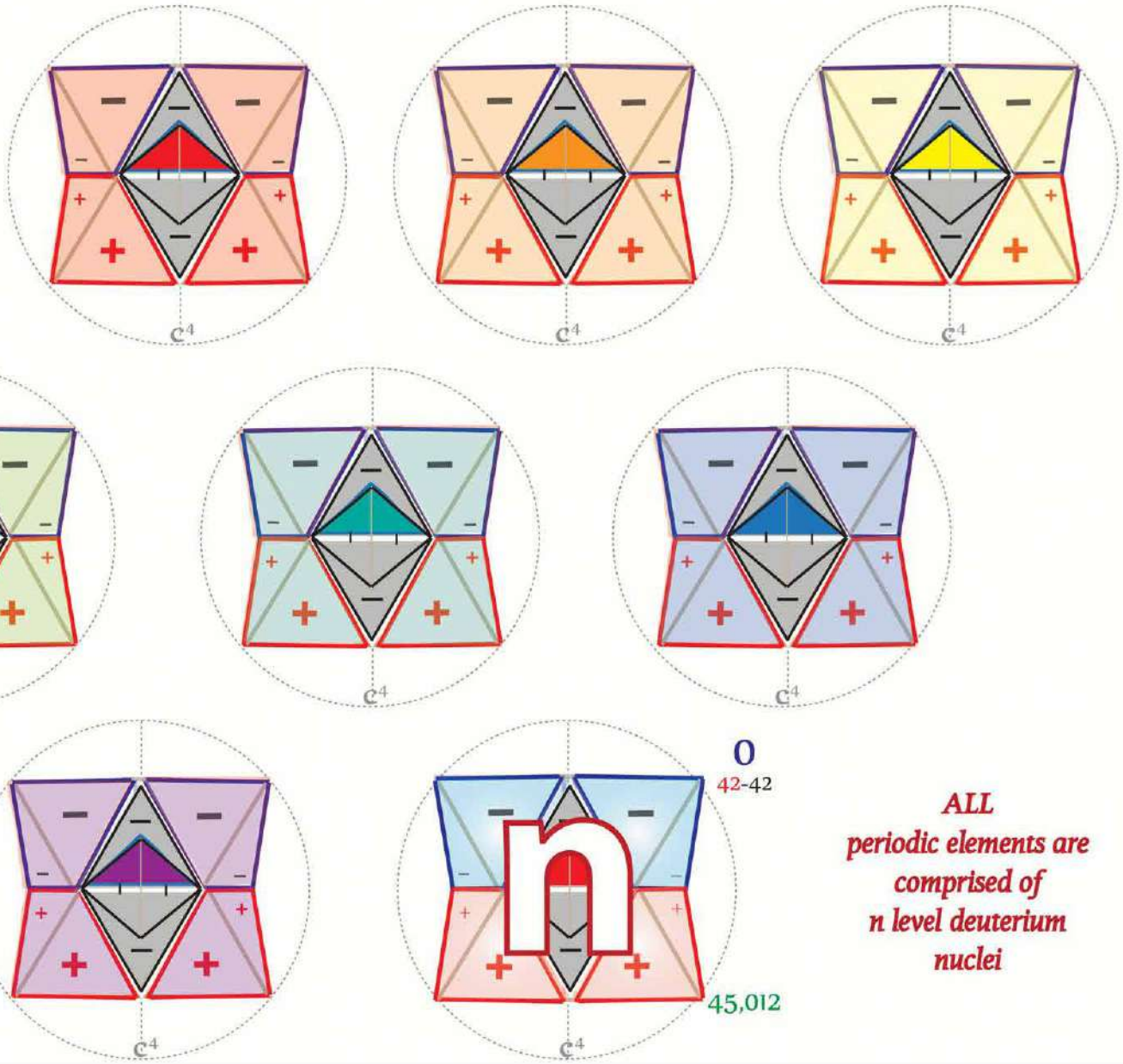


The mass-ENERGY content of
4nπ Tetrahedral standing-wave topologies
forms the basis of all periodic elements

Periodic element nuclei



ALL periodic elements are comprised of n level deuterium nuclei

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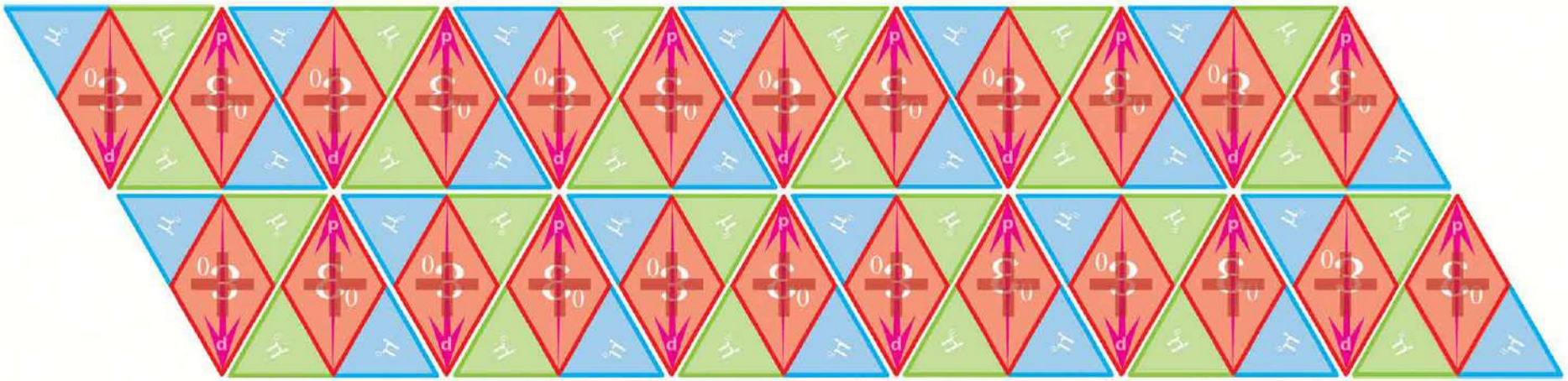
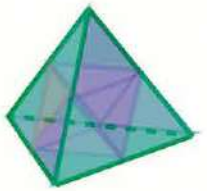
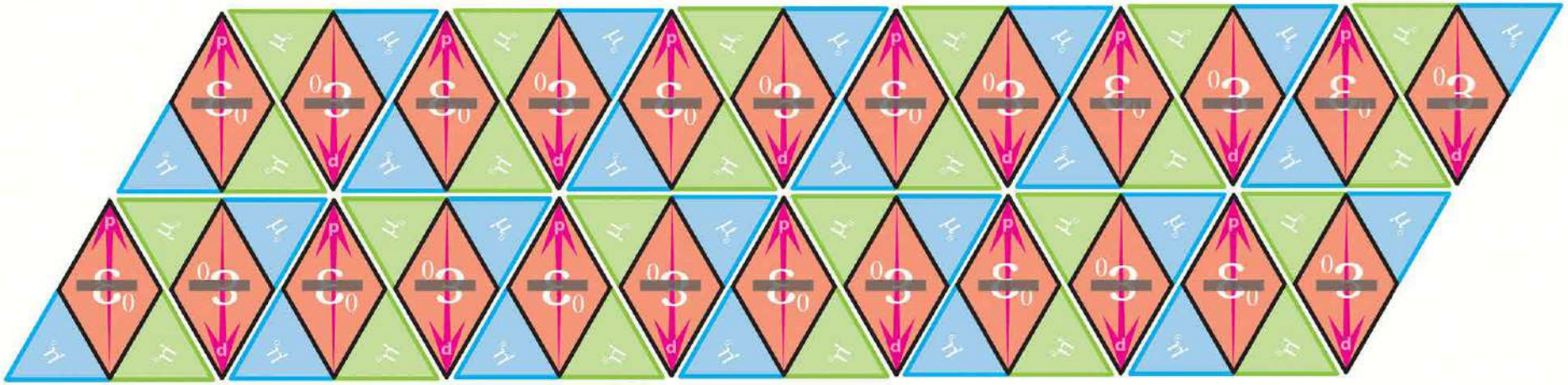


n1 - Charged Tetryon Templates





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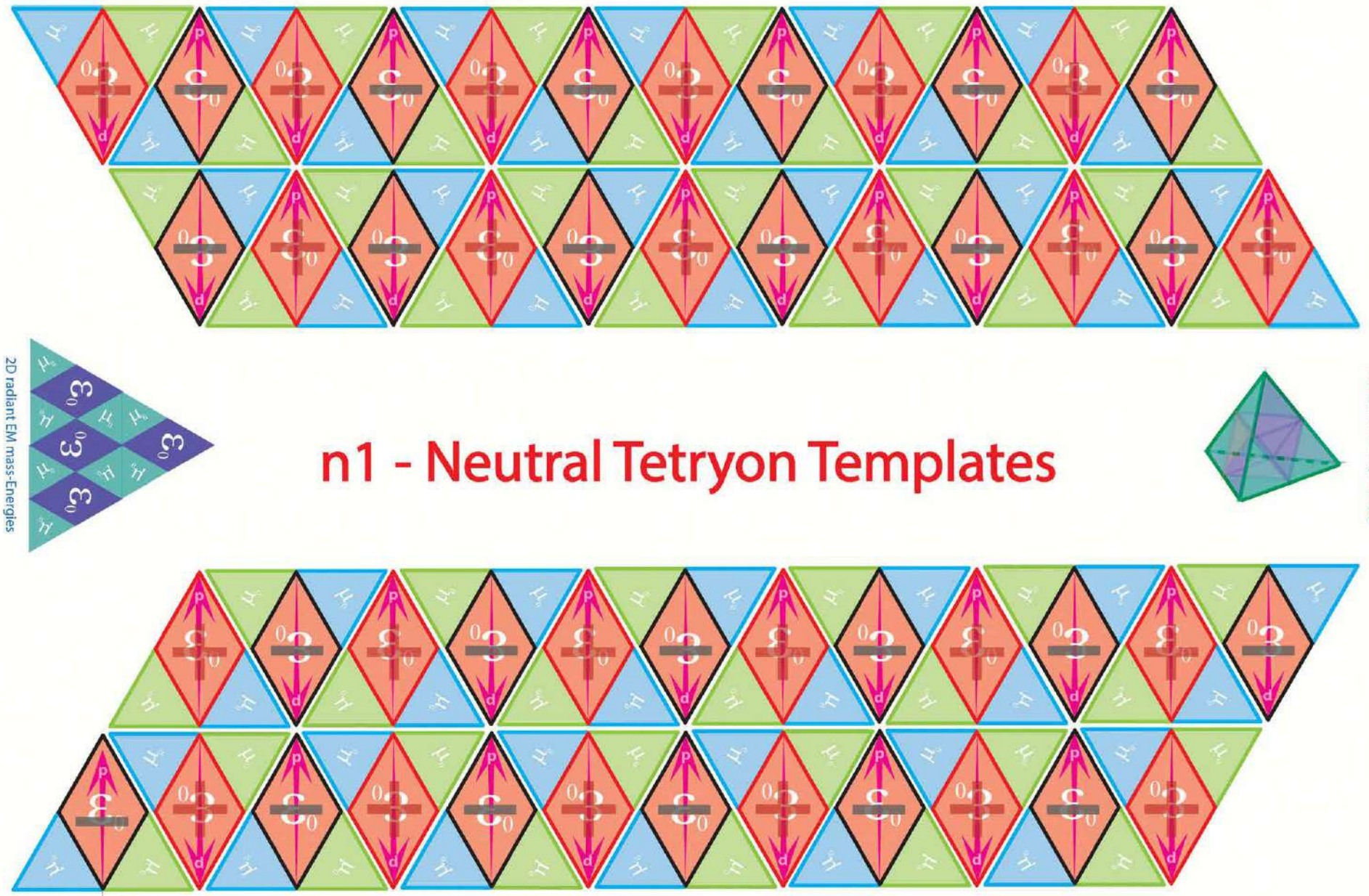

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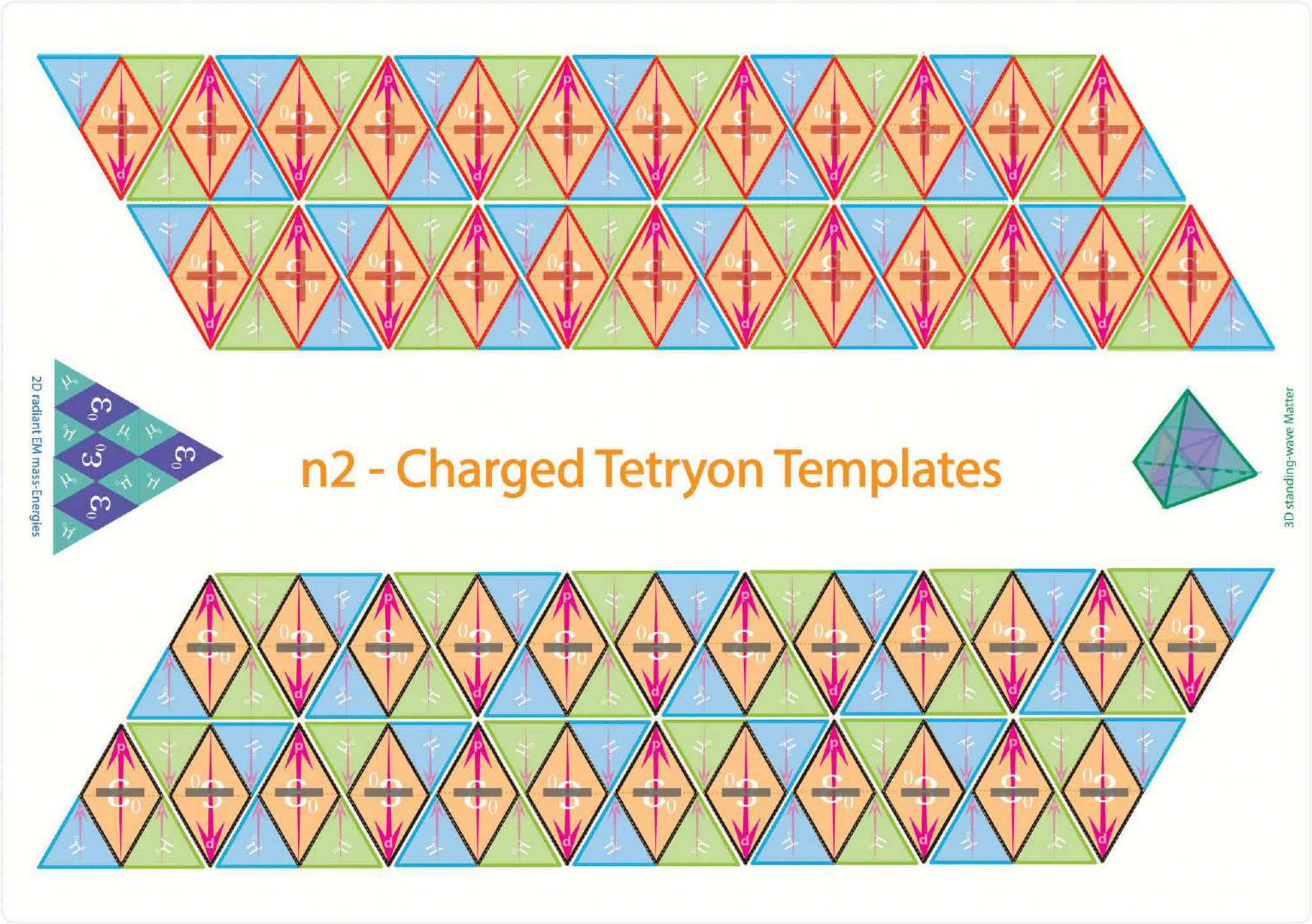

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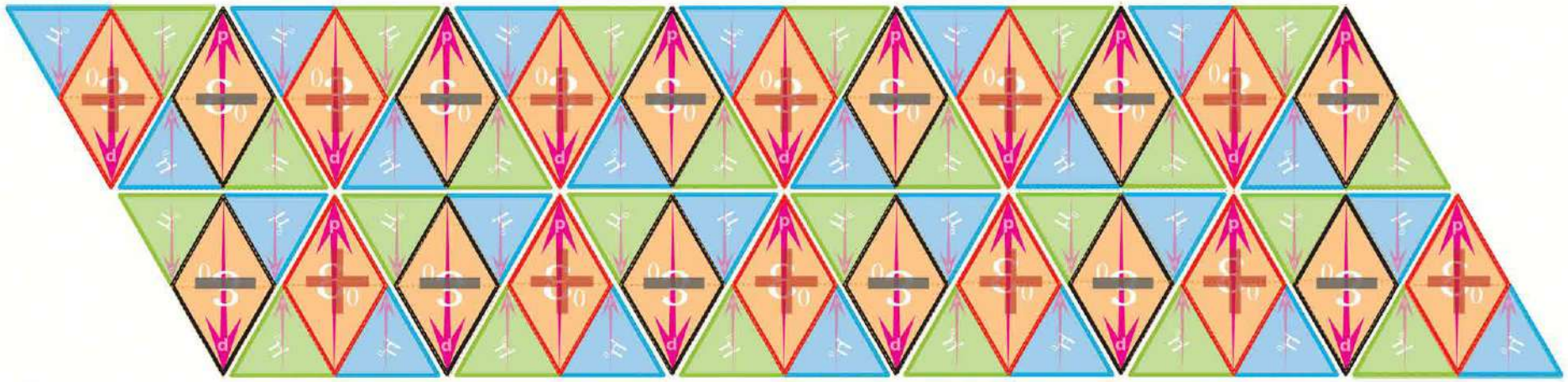
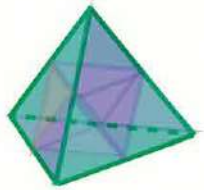
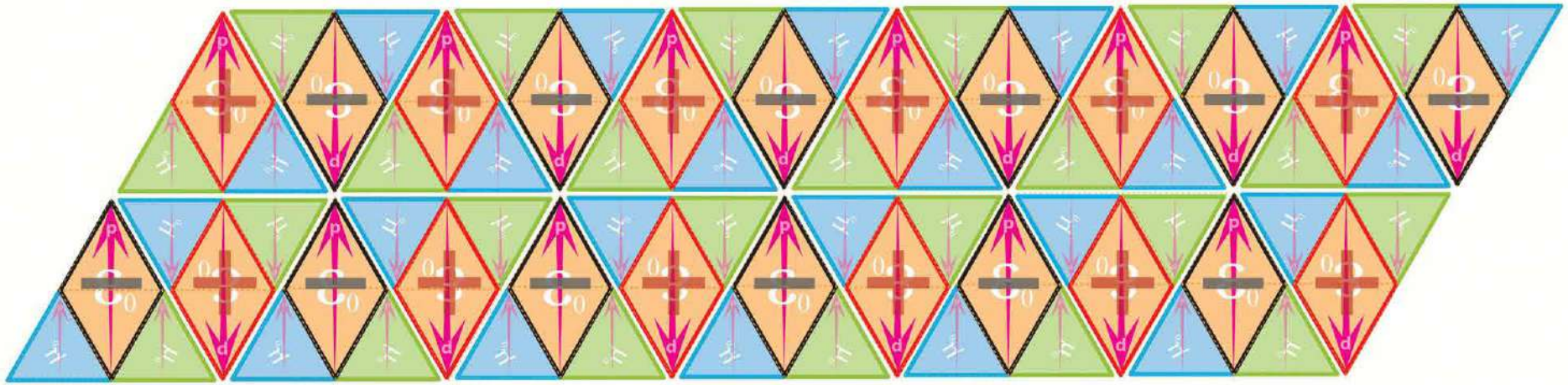


n2 - Neutral Tetryon Templates





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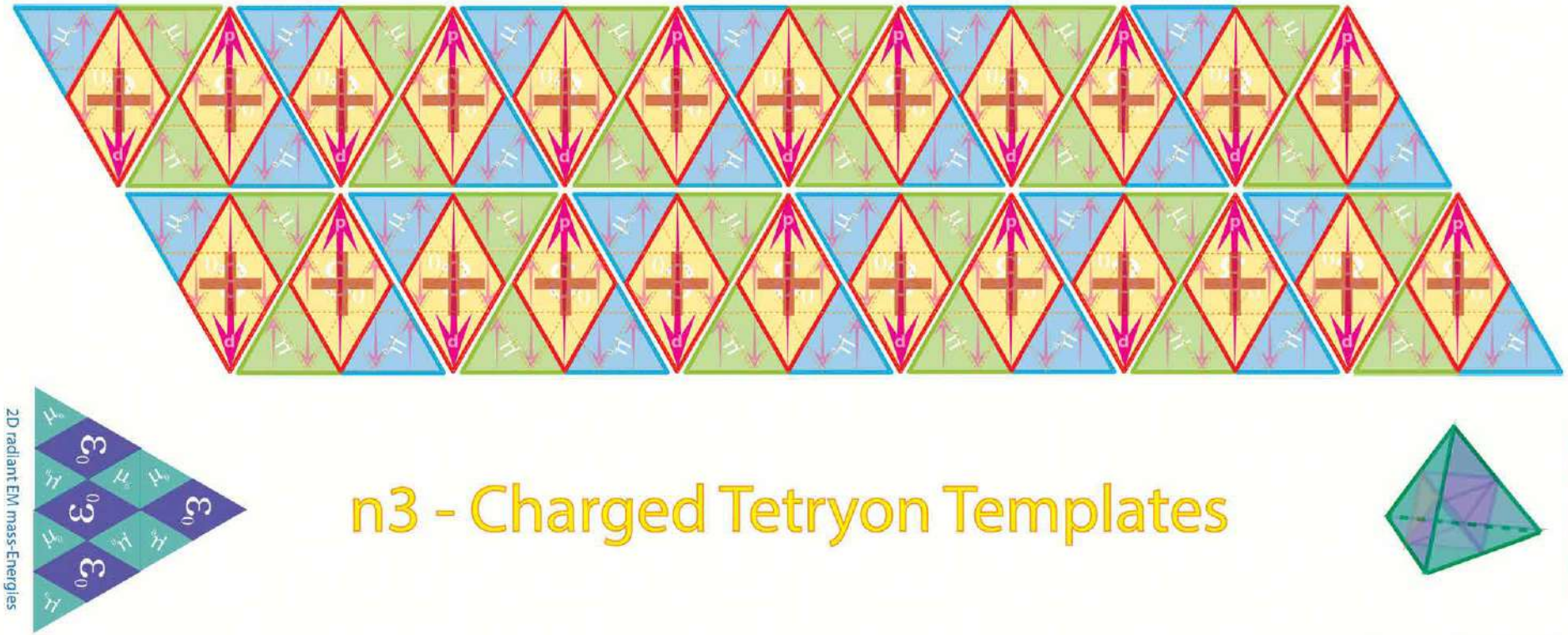
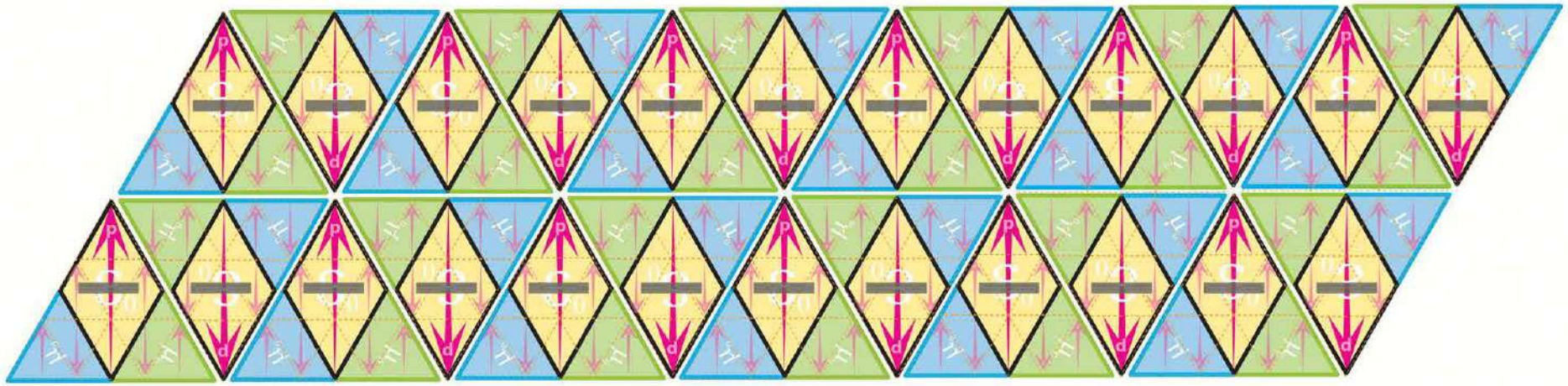


2D radiant EM mass-Energies

n3 - Charged Tetryon Templates

3D standing-wave Matter



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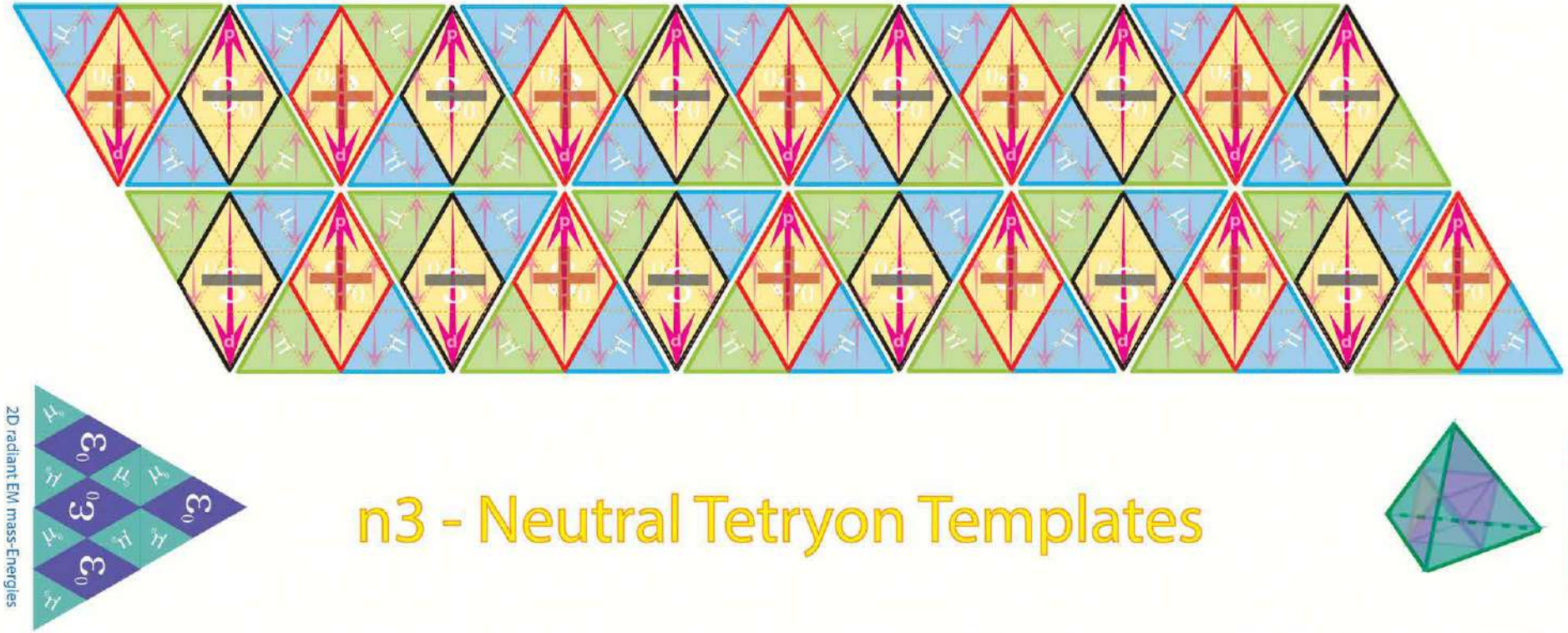
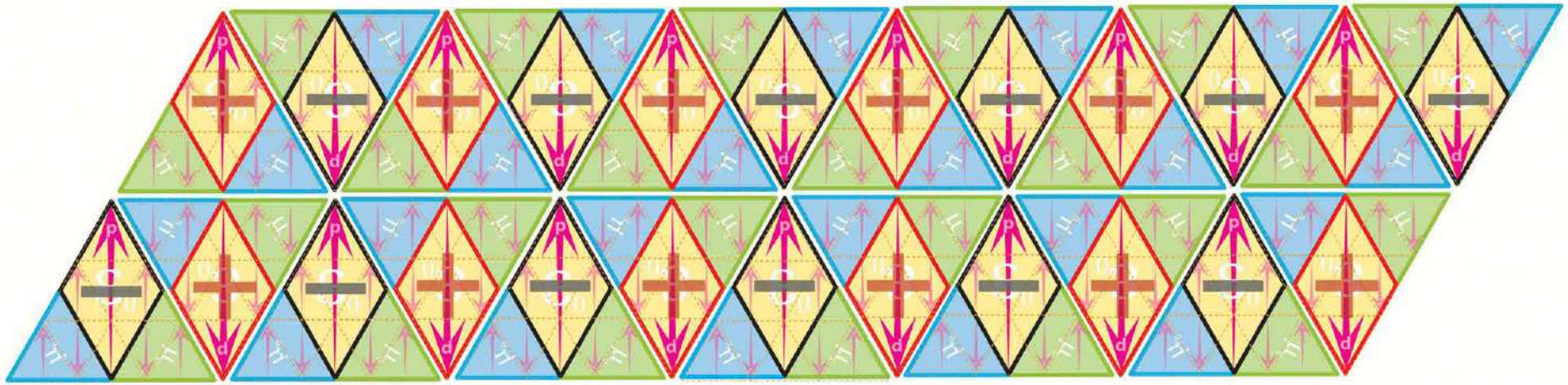


n3 - Neutral Tetryon Templates



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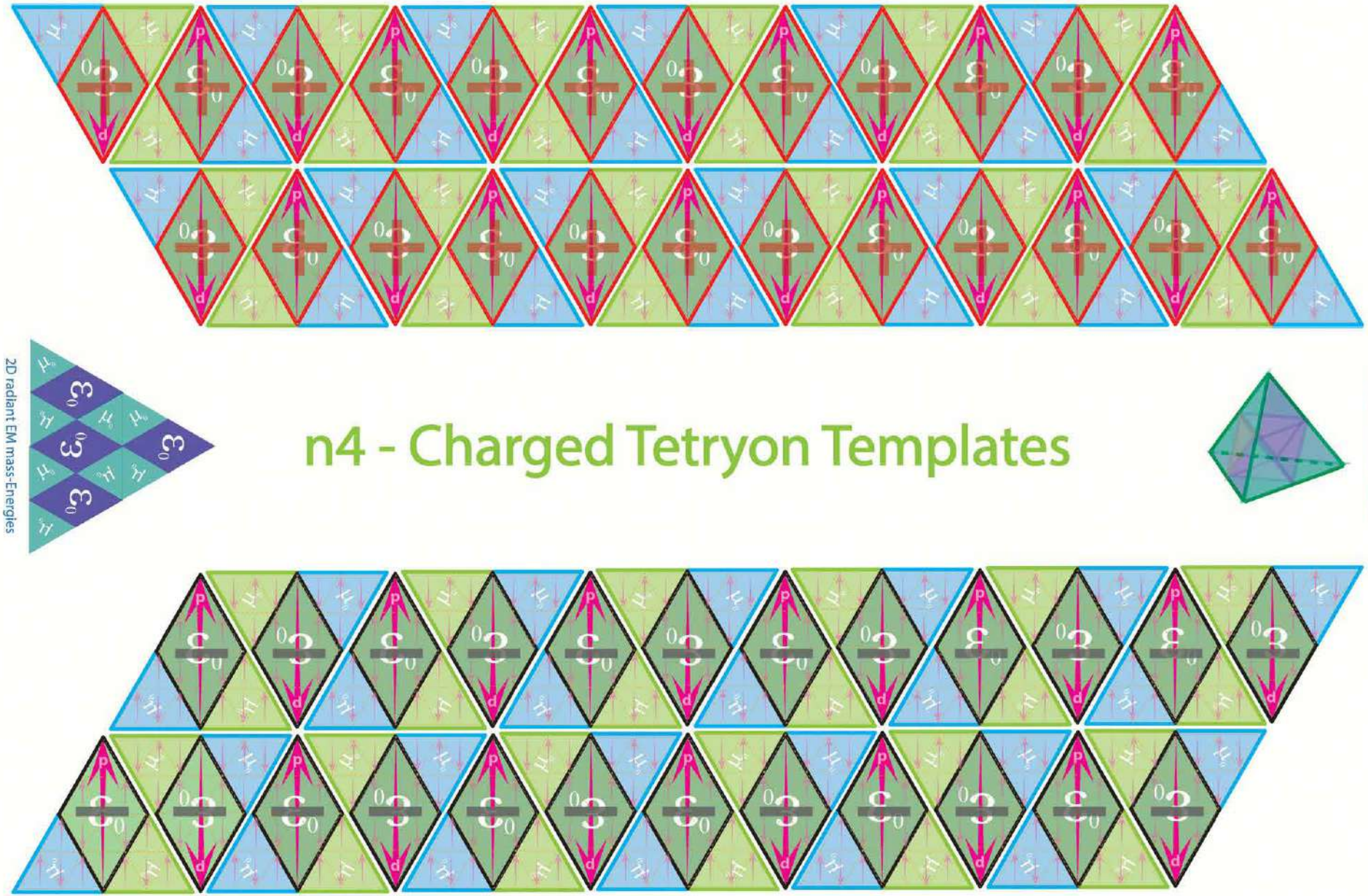

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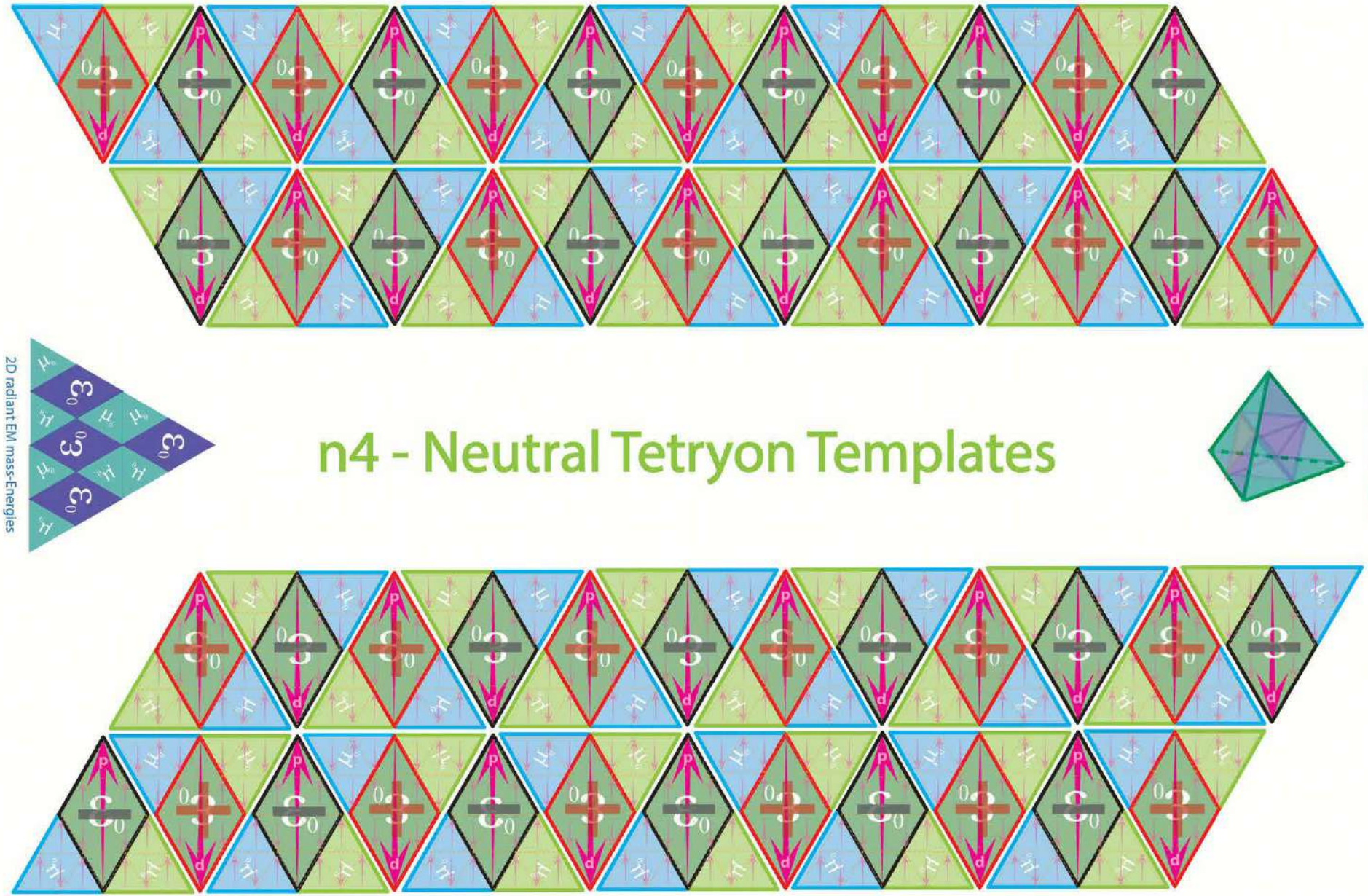

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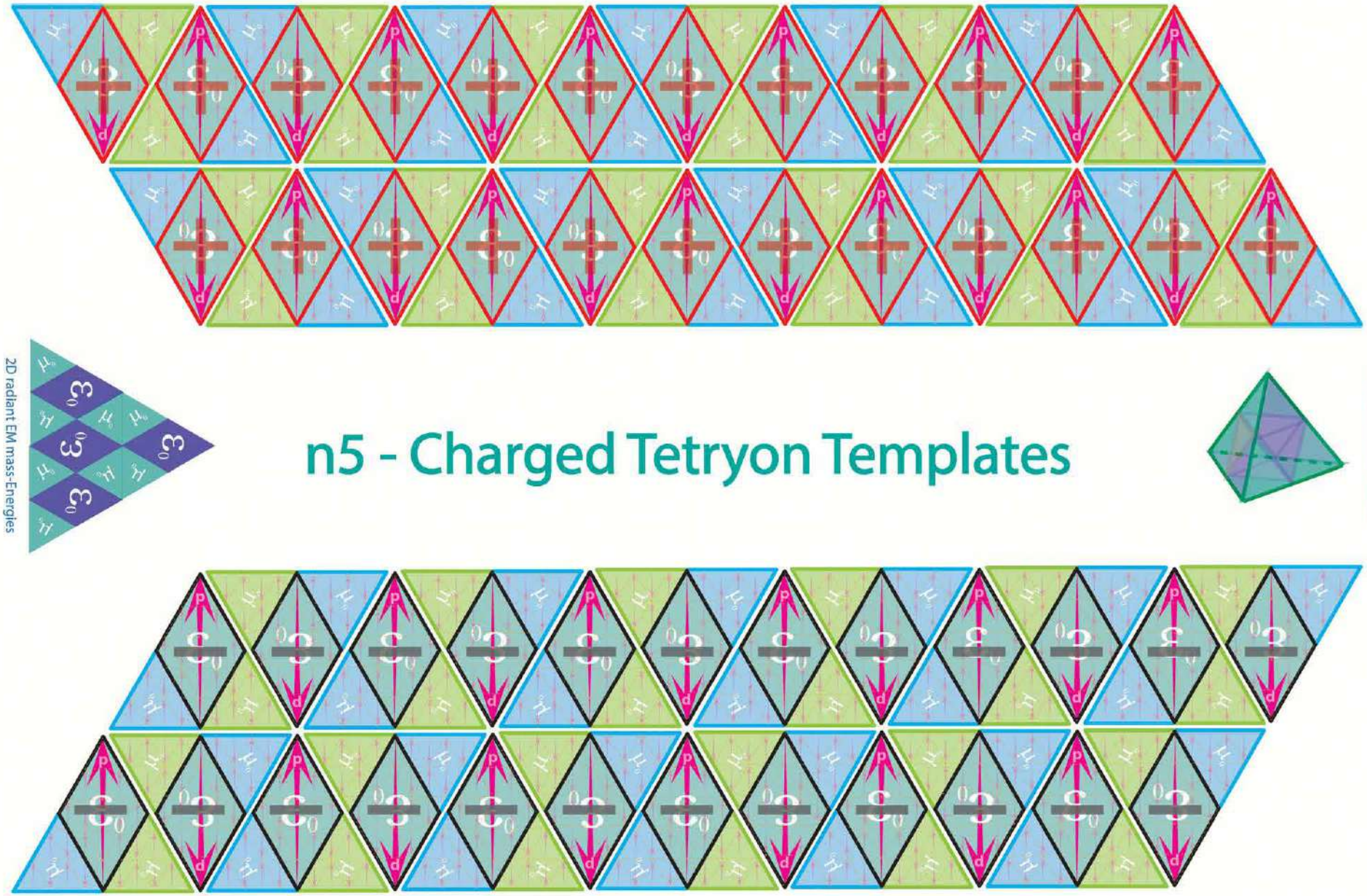

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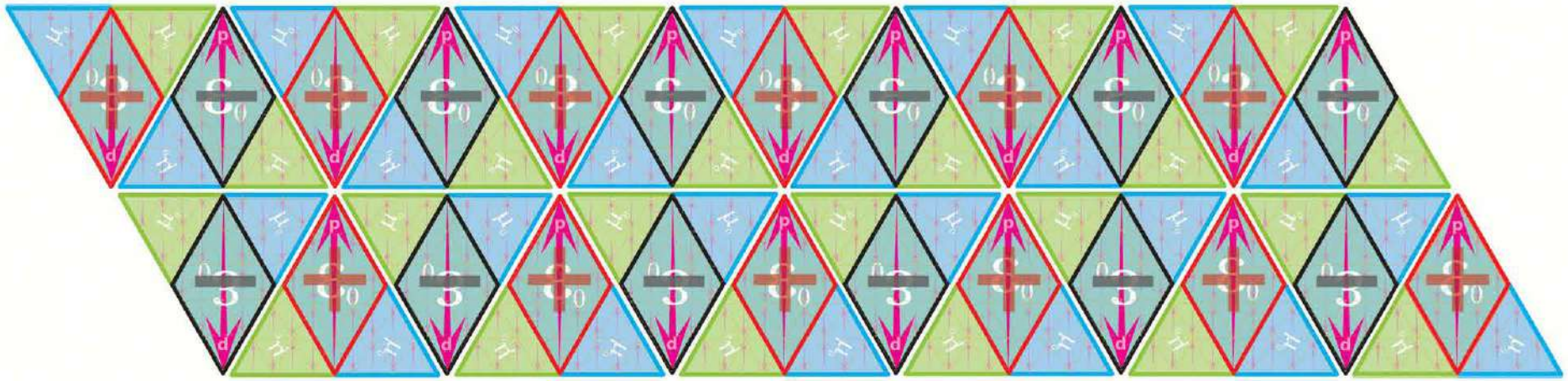
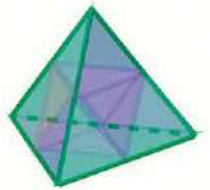
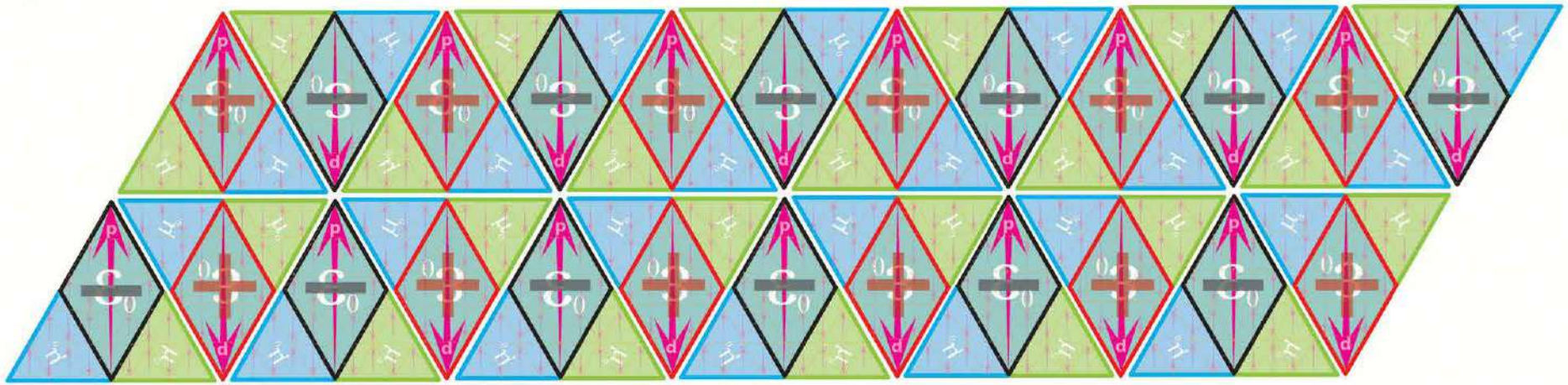


n5 - Neutral Tetryon Templates





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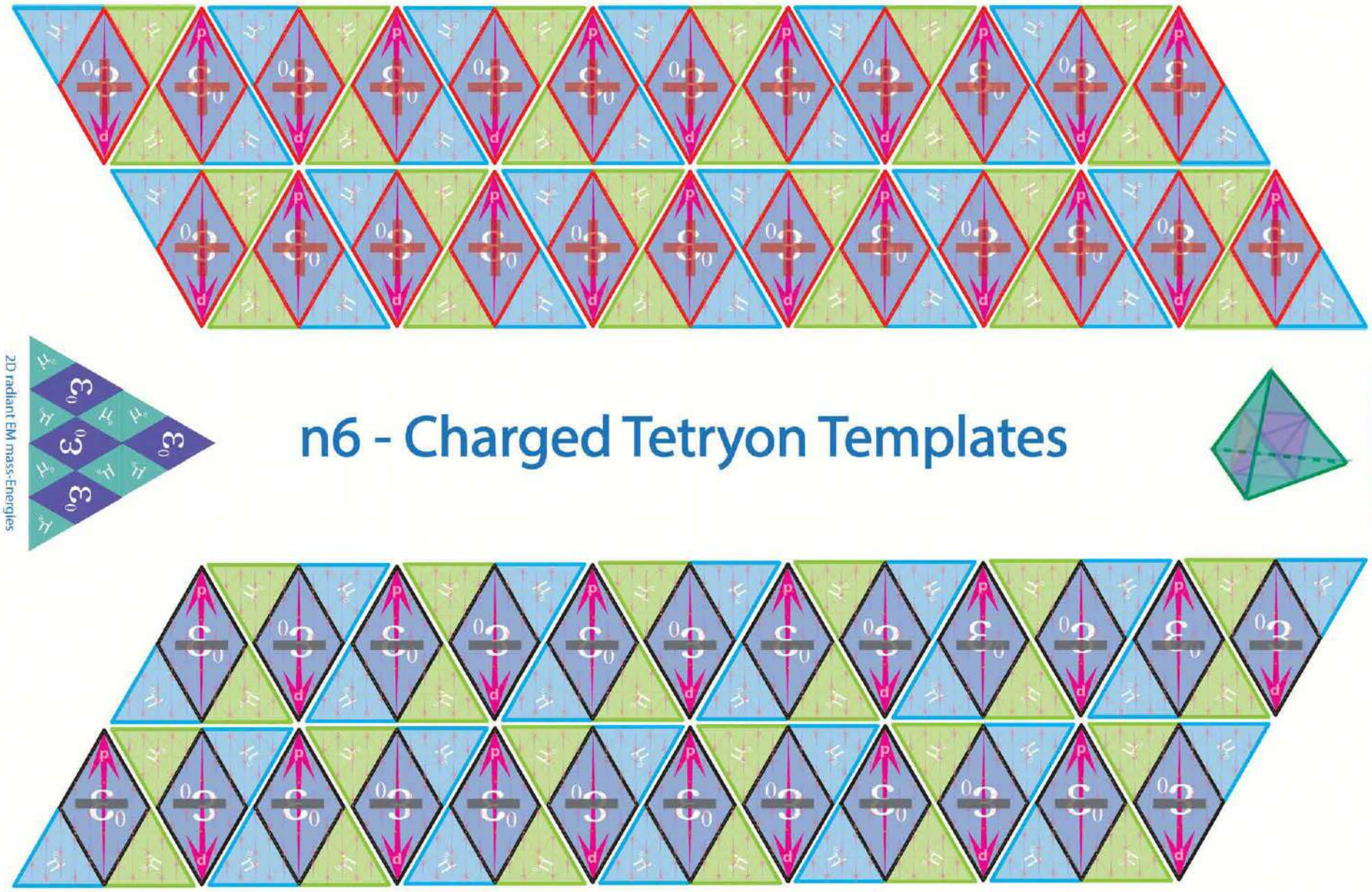

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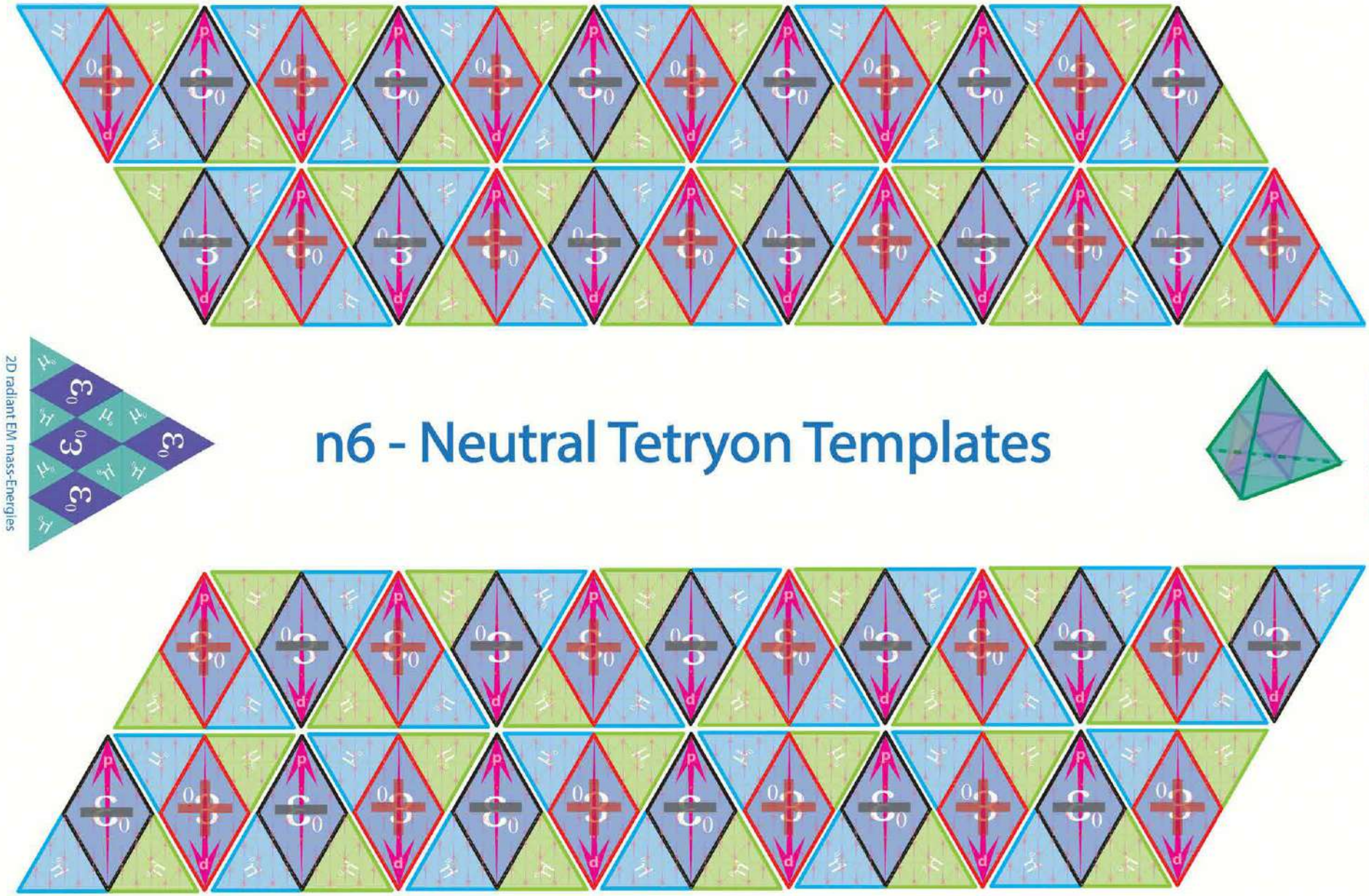

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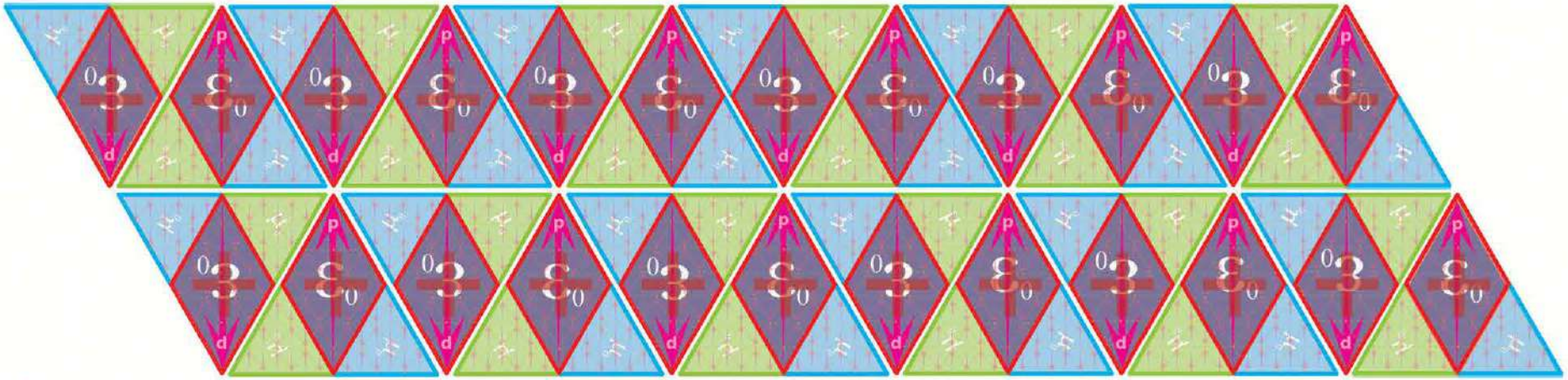
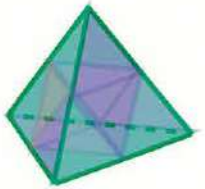
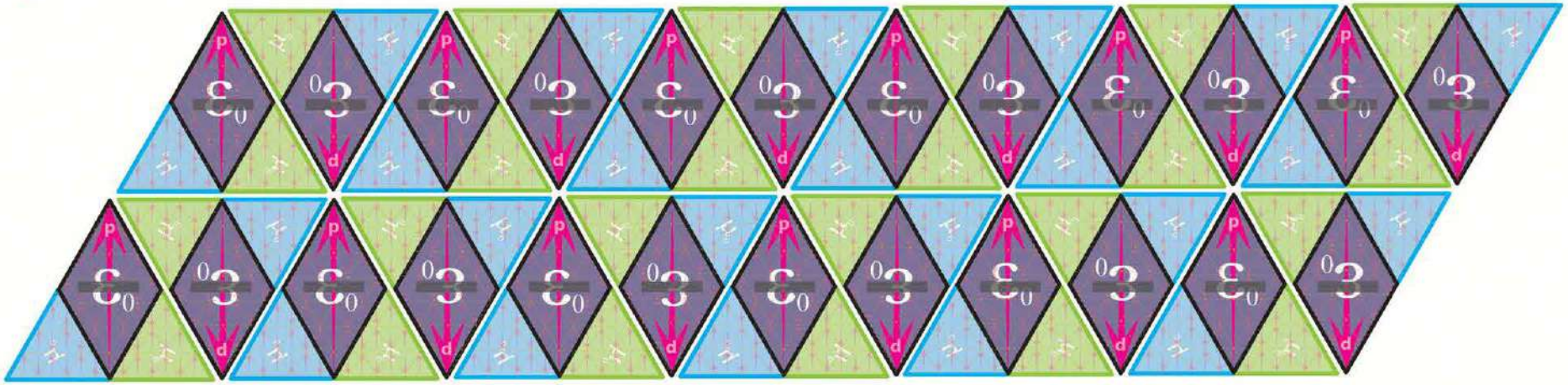


n7 - Charged Tetryon Templates





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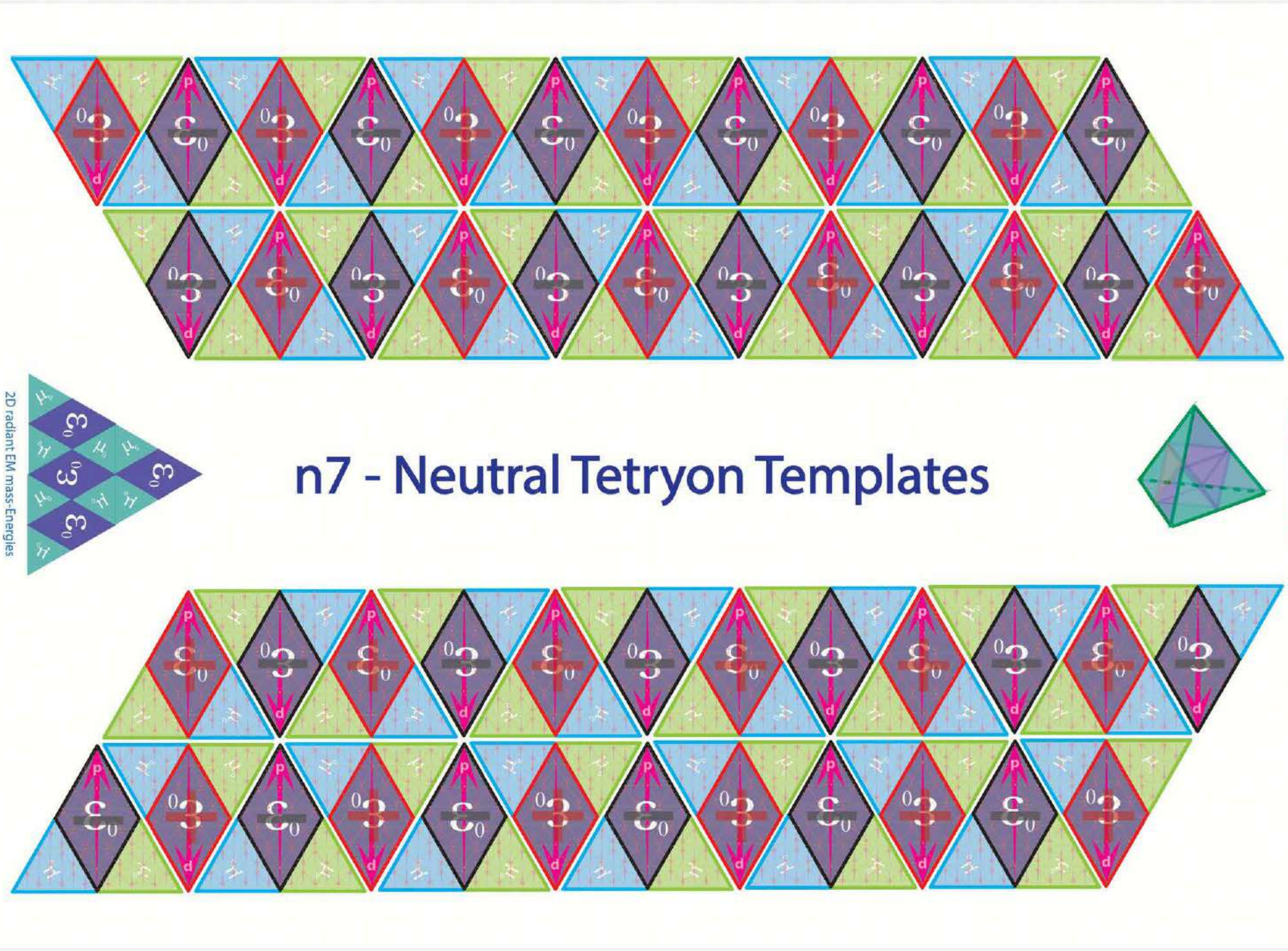

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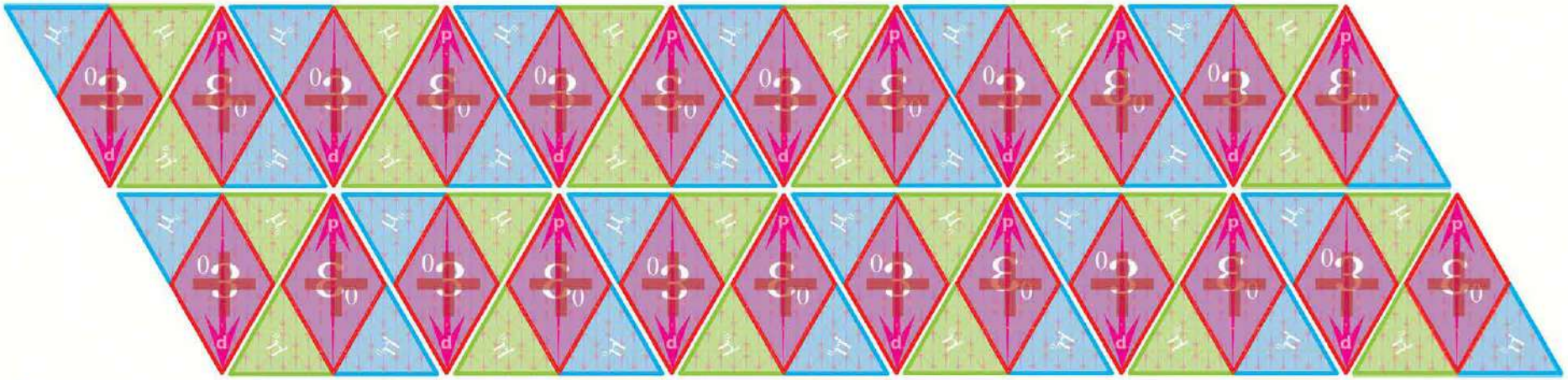
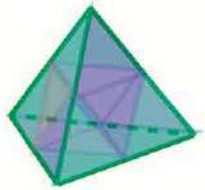
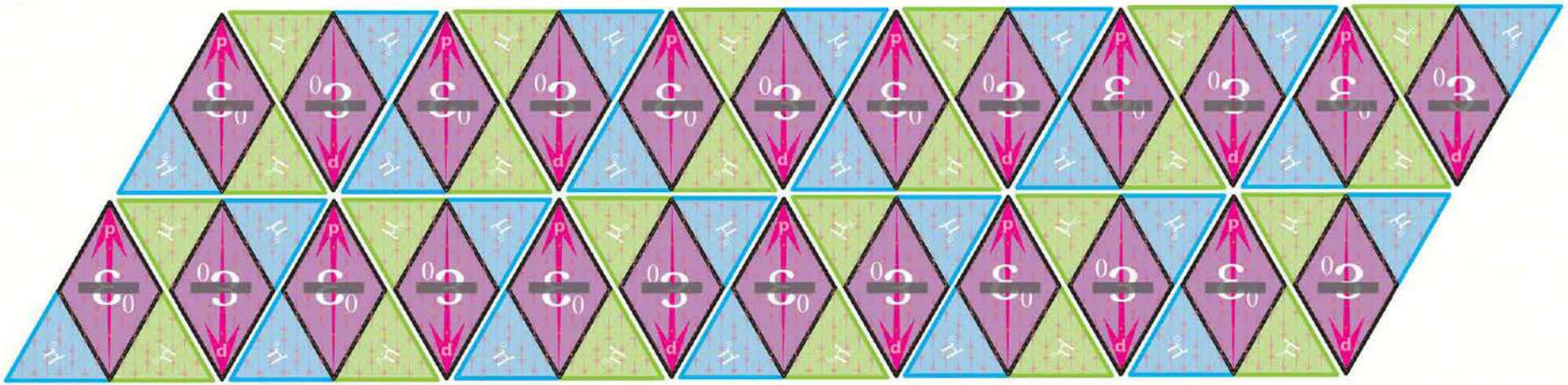


n8 - Charged Tetryon Templates





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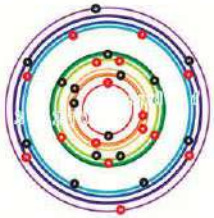
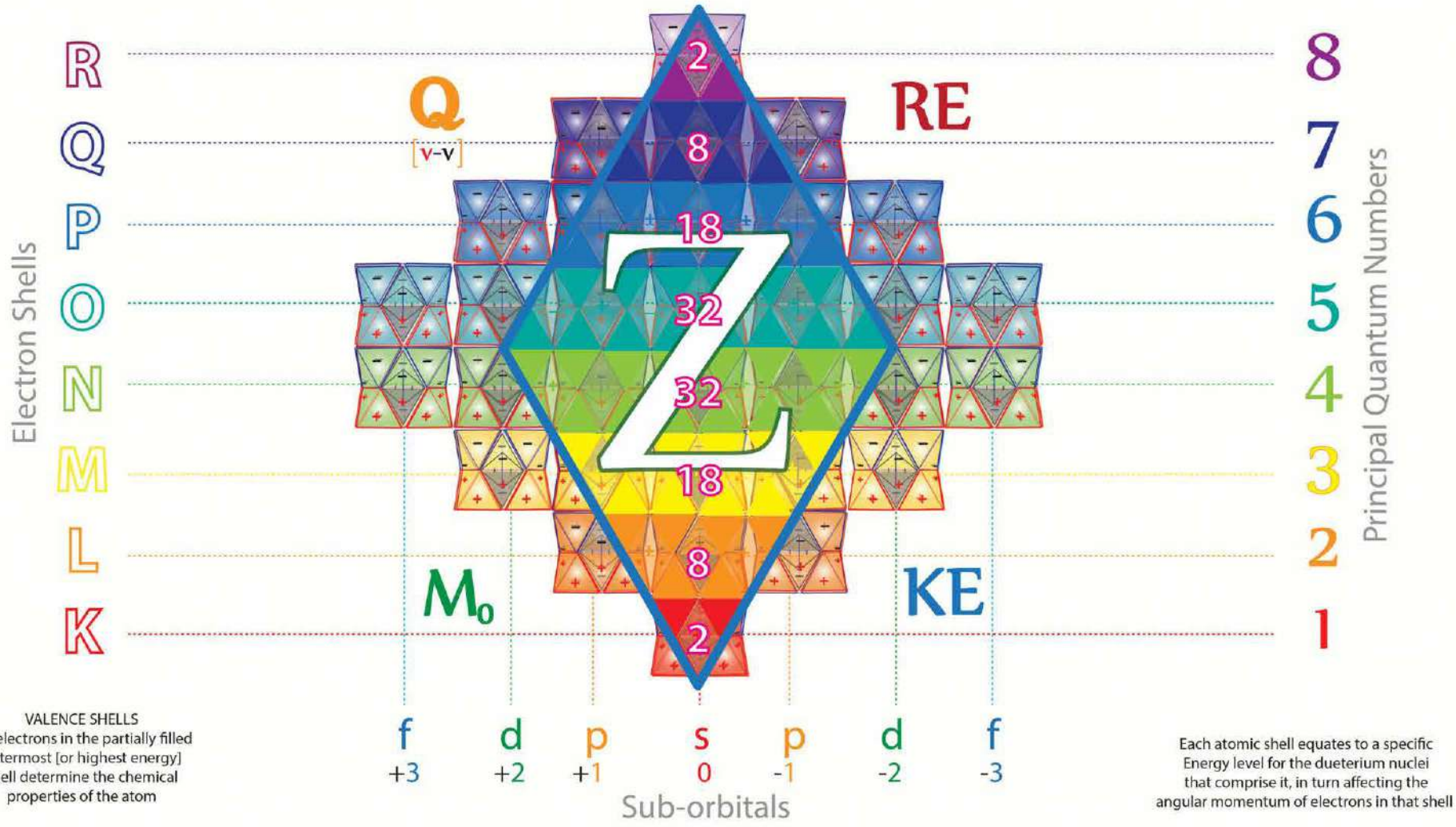


Each shell consists of one or more subshells, and each subshell consists of one or more atomic orbitals.

Periodic element geometries

An electron shell may be thought of as an orbit followed by electrons around an atom's nucleus. The closest shell to the nucleus is called the "1 shell" (also called "K shell"), followed by the "2 shell" (or "L shell"), then the "3 shell" (or "M shell"), and so on further and further from the nucleus. The shell letters K, L, M, ... are alphabetical

Each shell can contain only an integer number of whole deuterium nuclei [Proton, Neutron & electron]



VALENCE SHELLS
The electrons in the partially filled outermost [or highest energy] shell determine the chemical properties of the atom

Each atomic shell equates to a specific Energy level for the dueterium nuclei that comprise it, in turn affecting the angular momentum of electrons in that shell

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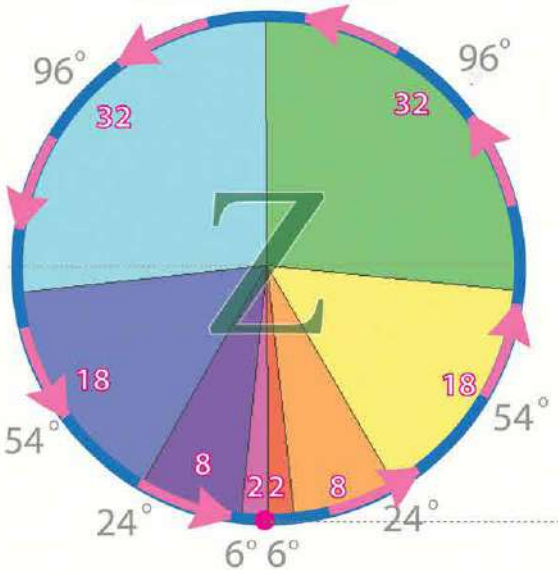
Periodic Harmonic motions

$x = A \cos(\omega t + \varphi)$

Much of the math in of modern physics is predicated on the assumption that π [where it appears] is related to the properties of a circle

$F = -kx$

Circular motion



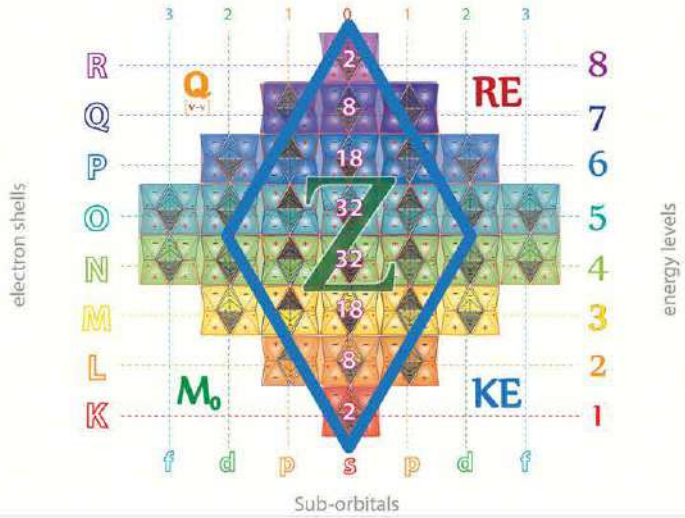
Linear motion

Simple harmonic motion can be visualized as the projection of uniform circular motion onto one axis

Principal Quantum Numbers

circular harmonic motion

simple harmonic motion



Circular motions describe the motion of a body with a changing velocity vector [the result of an acceleration force].

Nuclei per shell in elements follows a 'periodic summation rule' that is reflective of photonic energies

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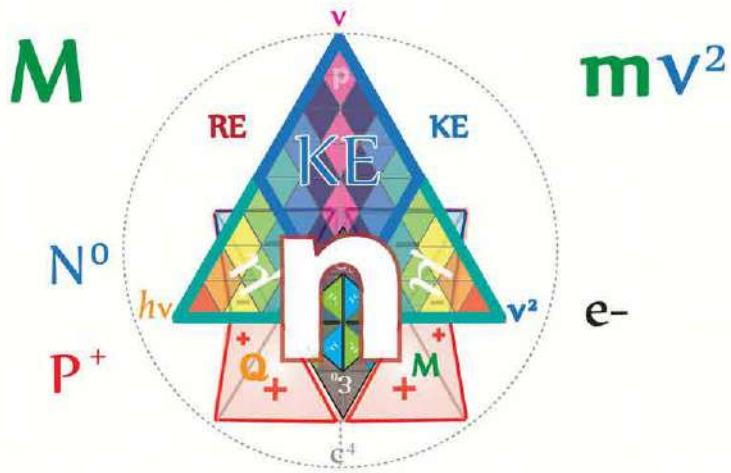
Atomic nuclei mass-energies

Each element's weight [mass-Matter in a gravitational field] is the result of the total quanta comprising that element



The nuclei forming each atomic shell have specific mass-energy quanta

$$\overset{8}{\underset{1}{n}}\left[\left[72(n)^2\right]+\left[12e19\right]+\left[m_e v^2\right]\right]$$

Baryon rest masses · lepton rest mass · KEM

Deuterium mass-energy per shell

Despite having differing mass-energies each Deuterium nuclei has the same velocity invariant Matter geometry [84π]

spin orbital coupling in synchronous quantum convertors

Electrons act as quantum scale rotating armatures in atomic nuclei and can only have specific energies reflective of the electron orbital energy level of the Baryons in which they are found

They acheive these energy levels by absorbing or emitting photons to acheive the specific angular momentum required

Baryon mass-energies
n
E
The quantum level mass-energies of Baryons determines the kinetic energies of electrons
1n - 1 e19v
electron KEM field
hv²
73,728 n32 8 v8 3.268969693 e15
69,192 n31 7 v7 2.502804921 e15
64,800 n30 6 v6 1.838795452 e15
60,552 n29 5 v5 1.276941286 e15
56,448 n28 4 v4 8.172424232 e14
52,488 n27 3 v3 4.596988631 e14
48,672 n26 2 v2 2.043106058 e14
45,000 n25 1 v1 5.107765145 e13
1.2 e20
electron rest Matter is velocity invariant
Compton frequencies
930 MeV
496 keV
spectral frequencies
13.6 eV

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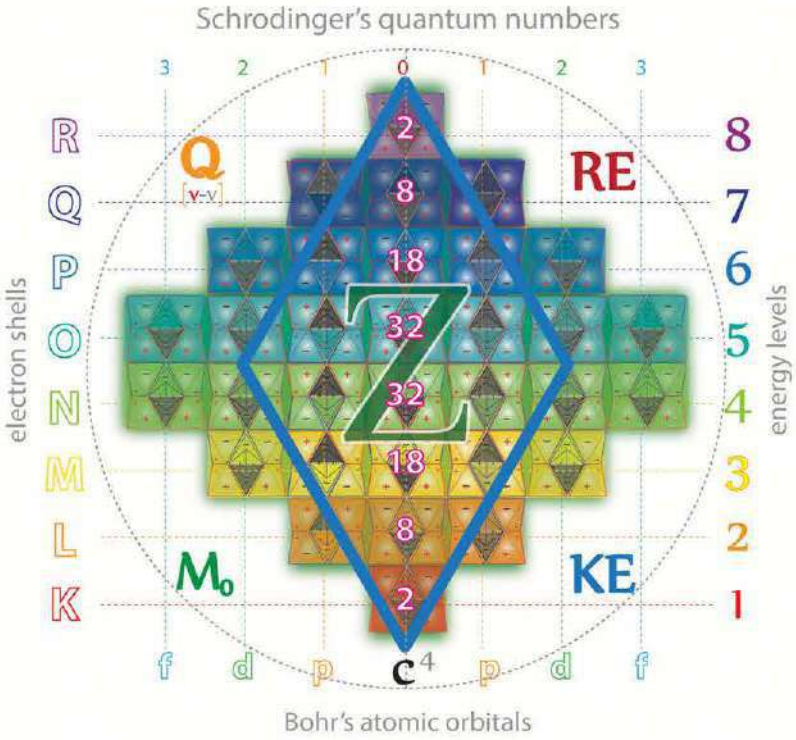
Baryons **930.947 MeV** + KEM fields **13.525 ev** + electrons **496.519 keV**

Mapping Planck mass-energy contributions to elementary Matter and isotopes



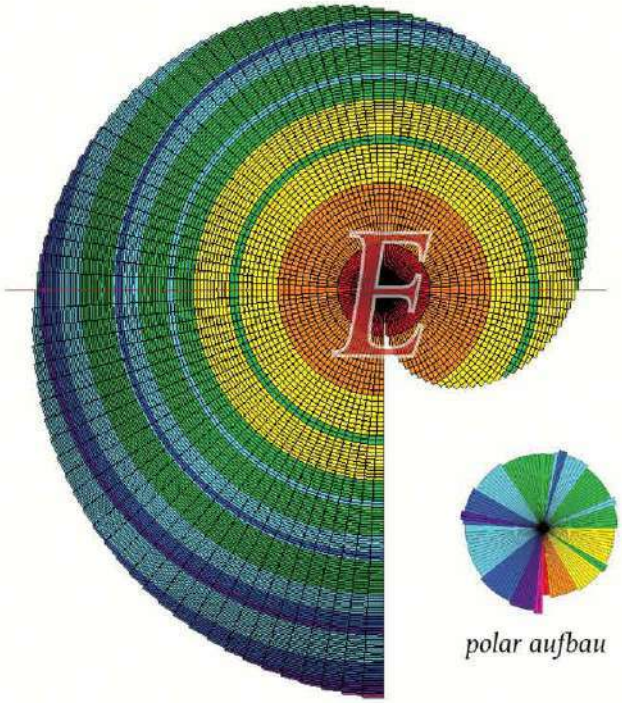
$E = hv^2$

$n^2 + v^2 + e = Z$

general form quatratic equation

$ax^2 + bx + c = Z$

$E = nhv$



polar aufbau

polar energy spirals courtesy of Rene Cormier

Identifying electron rest Matter topologies as velocity invariant we can re-arrange the component Planck mass-energy geometry formulation of periodic elements to

$$h\left[72[v^2]_{\text{Deuteron rest mass}} + v_{\text{Spectral lines}} + 1.20\,e20\,v_{\text{electron rest mass}}\right]$$

reveal a quadratic formulation for all Z numbers

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$$\sum_{K}^{R}$$

nuclei per shell

$$\sum_{K}^{R} Z$$

Periodic Summation

Periodic summation is a notation developed for Tetryonic theory to model the geometric series addtion of Z[n²] energy level Deuterium nuclei that form the periodic elements

$$\sum_{1}^{120} Z$$

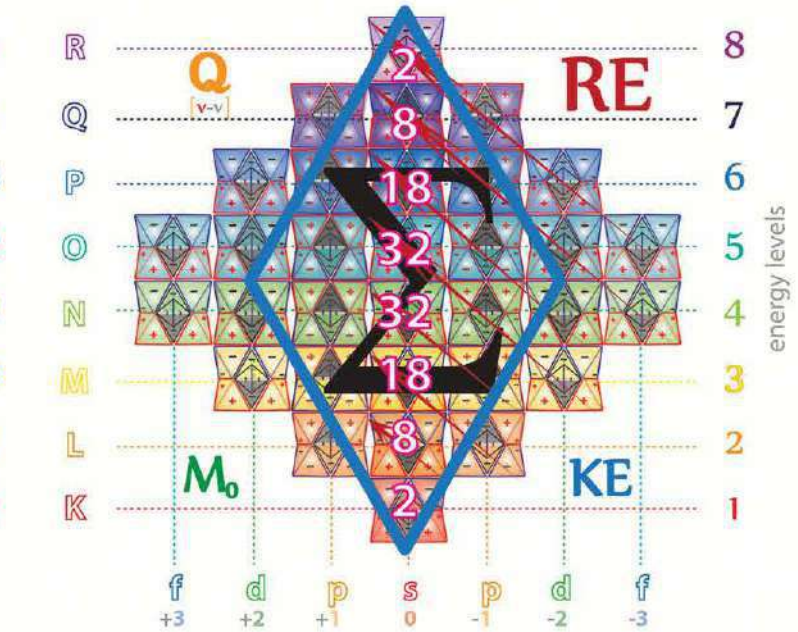
element number

STEP ONE

Periodic summation follows the atomic shell electron config

$$\sum_{K}^{R} 2(x^2) =$$

2	R	8
8	Q	7
18	P	6
32	O	5
32	N	4
18	M	3
8	L	2
2	K	1



Each atomic shell can hold only a fixed number of deuterium nuclei

STEP TWO

Periodic elements build up following the aufbau sequence

$\sum_{K}^{R} = 2$	2 nuclei [74,496 ea]	120	Unbinilium
$\sum_{K}^{Q} = 8$	+ 8 nuclei [69,780 ea]	118	Ununoctium
$\sum_{K}^{P} = 18$	+ 18 nuclei [65,232 ea]	110	Darmstadtium
$\sum_{K}^{O} = 32$	+ 32 nuclei [60,852 ea]	92	Uranium
$\sum_{K}^{N} = 32$	+ 32 nuclei [56,640 ea]	60	Neodymuim
$\sum_{K}^{M} = 18$	+ 18 nuclei [52,596 ea]	28	Argon
$\sum_{K}^{L} = 8$	+ 8 nuclei [48,720 ea]	10	Neon
$\sum_{K}^{K} = 2$	+ 2 nuclei [45,012 ea]	2	Helium
		0	Hydrogen

THe LHS of the notation determine the number of nuclei in each atomic shell, from the periodic mass-energy levels for atoms, and the RHS follows the aufbau building principle to determine the rest mass-Matter of any specific element

Aufbau

Each periodic element is made of Z [n² energy] deuterium nuclei

Z# [z Protons [24-12] | z Neutrons [18-18] | z electrons [0-12]] n1-8

Planck mass-energies form the surface integral of rest Matter topologies for each periodic element

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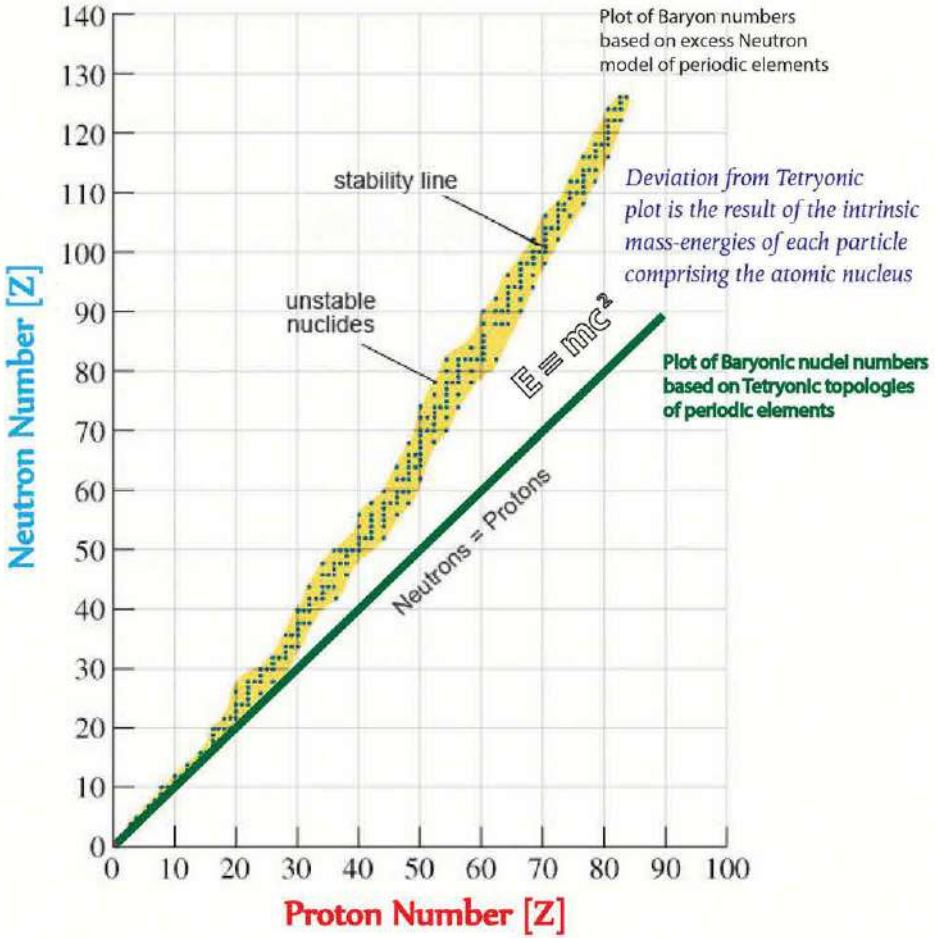
Proton - Neutron Curve

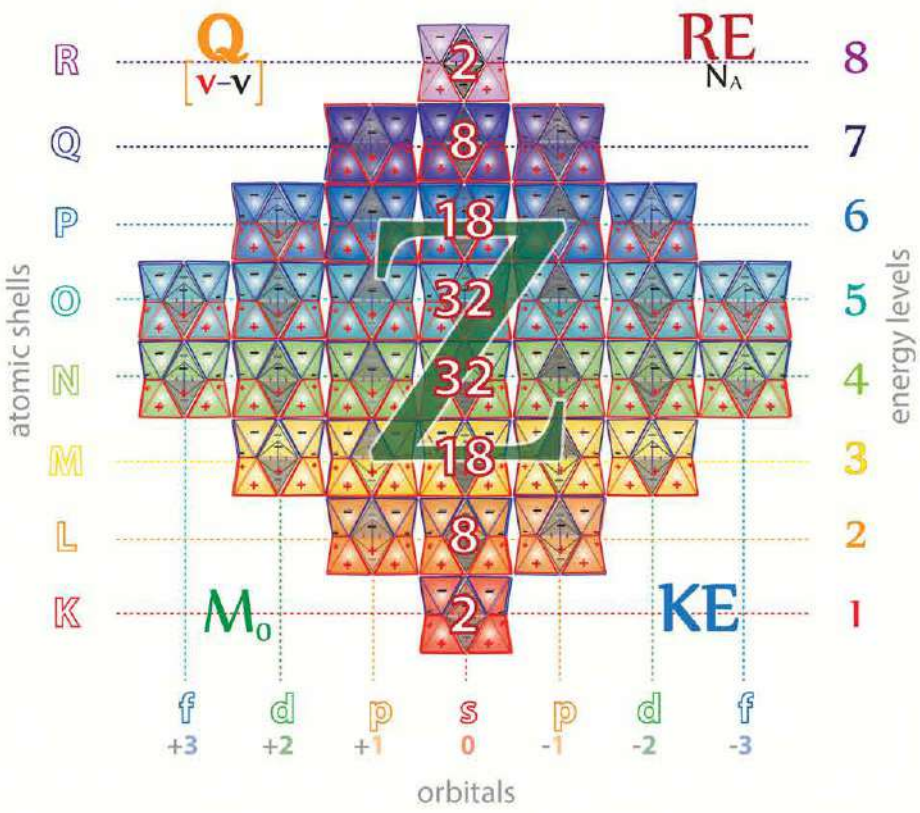
The graph below is a plot of neutron number against proton number.
It is used as rule to determine which nuclei are stable or unstable.


Plot of Baryon numbers based on excess Neutron model of periodic elements
stability line
unstable nuclides
Deviation from Tetryonic plot is the result of the intrinsic mass-energies of each particle comprising the atomic nucleus
E=mc²
Plot of Baryonic nuclei numbers based on Tetryonic topologies of periodic elements
Neutrons = Protons
Neutron Number [Z]
Proton Number [Z]
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Historically, Proton-electron numbers are viewed as being equivalent in neutral elementary matter with the excess molar mass measured being the result of 'excess or extra' Neutrons in the atom

Atomic Nuclei Numbers

All periodic elements have an EQUAL number of Protons, Neutrons & Electrons with their molar mass-Matter being determined by their quantum level mass-energies



Tetryonic modelling of the charged mass-ENERGY-Matter topologies of elementary atoms and the nuclei that comprise them, reveals a DIRECT LINEAR relationship for the number of Protons-electrons-Neutrons in all periodic elements and nuclear isotopes

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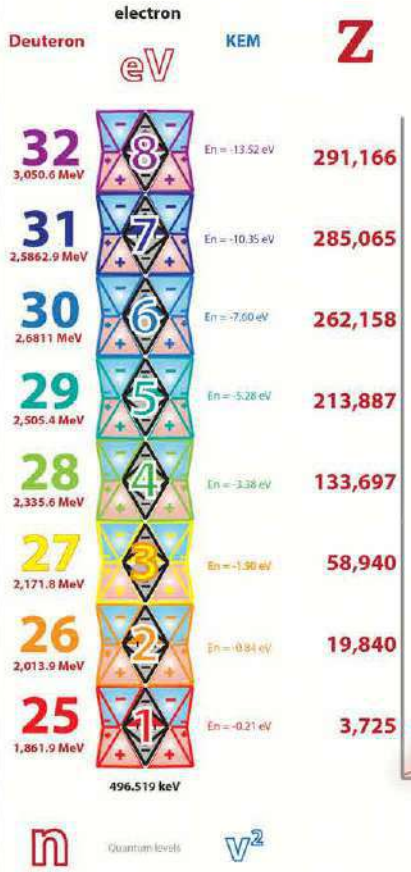
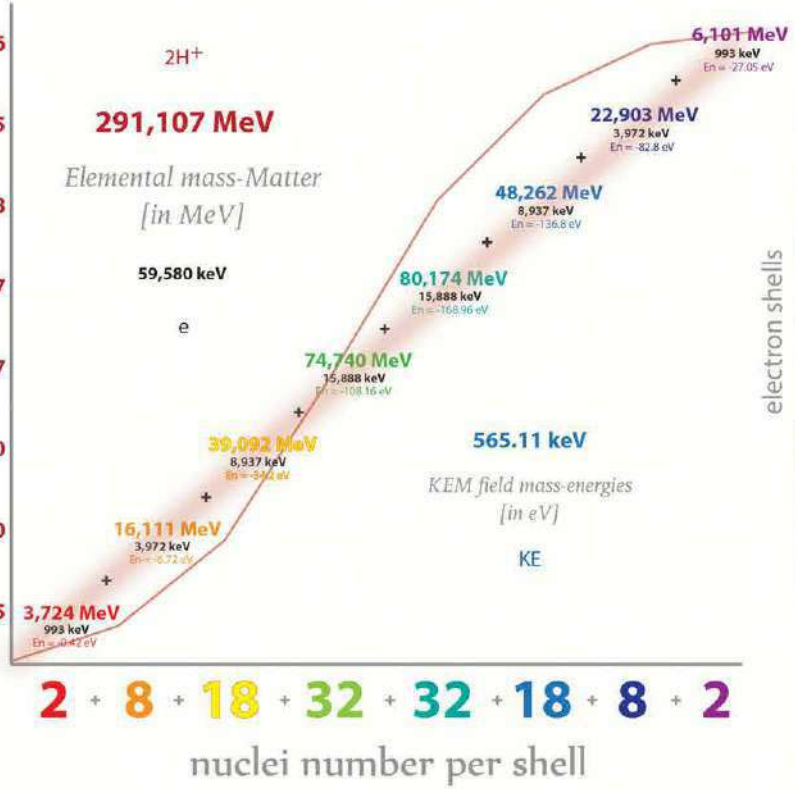
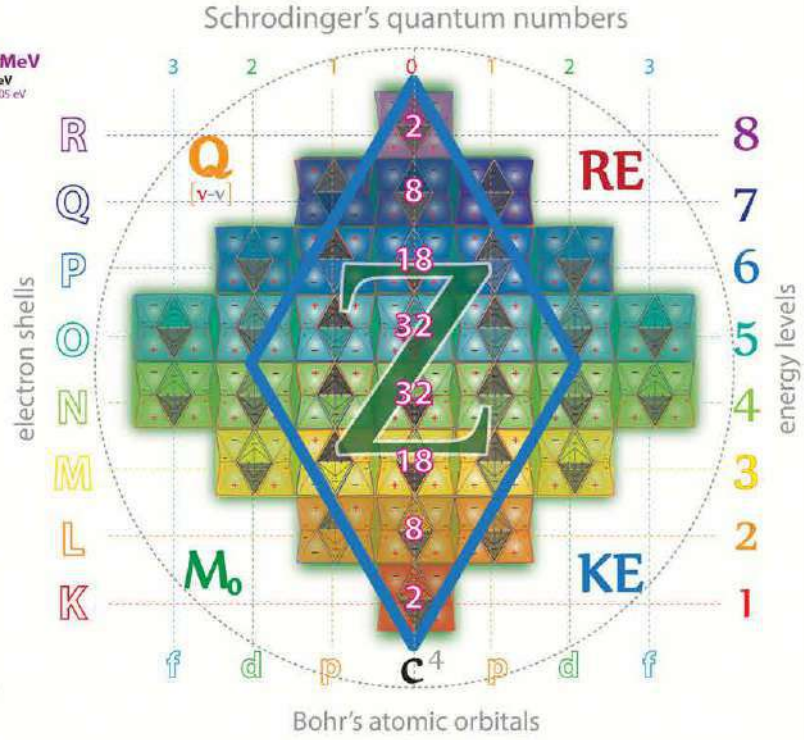
Planck mass-energy contributions to elementary Matter and isotopes



The mass-energy content of Deuterium nuclei creates the molar mass of elements
[not extra neutrons in excess of the elemental number]





n1 Elementary nuclei

are comprised of equal numbers of Protons, Neutrons & electrons with varying energy levels

Baryons		electrons		KEM fields
930.947 MeV	+	496.519 keV	+	13.525 ev

The mass-energy content of Matter topologies is velocity invariant

The mass-energy content of Baryons determines the KEM field of electrons

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All elements are comprised of n level Duetrium nuclei

Baryons **KEM fields** **electrons**

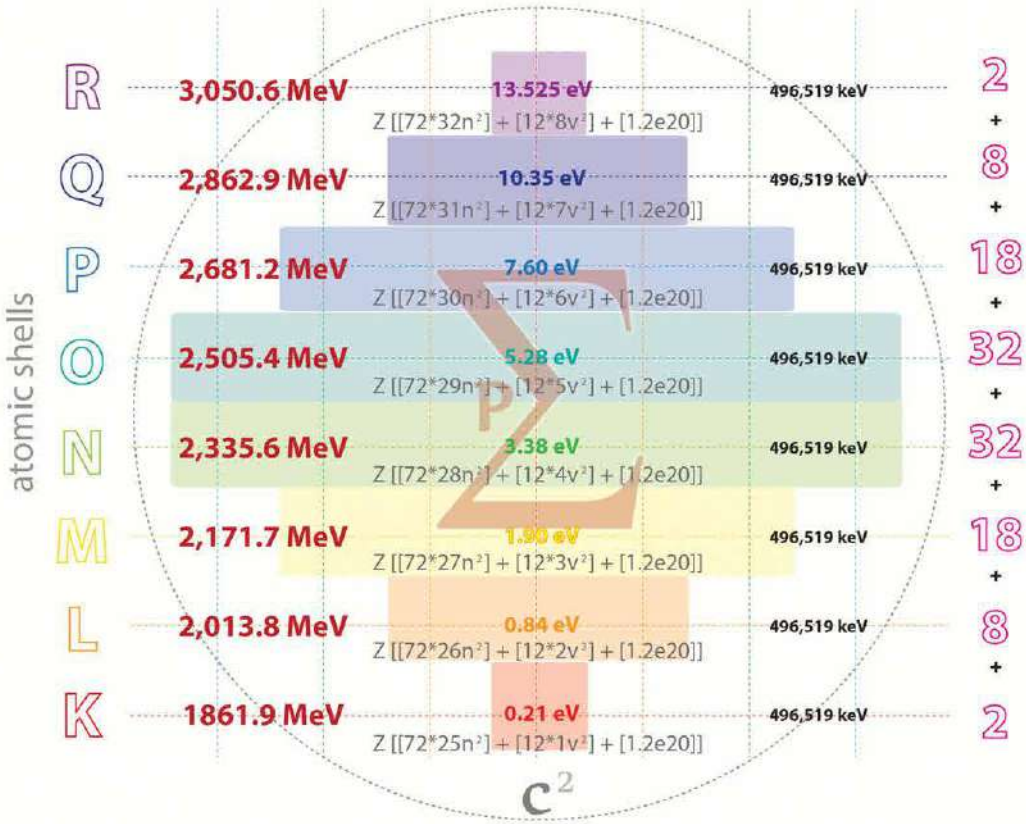
$$Z\,[[72n^2] + [12v^2] + [1.2e20]]$$

1,861,949 MeV **13.525 eV** **496,519 keV**

$2H^+$ $[72n^2]$ Z γ $[M_e v^2]$

Elemental mass-Matter [in MeV]

The atomic shell energy levels of Deuterium nuclei in elements



6,101 MeV
993 keV
En = -27.05 eV
+
22,903 MeV
3,972 keV
En = -82.8 eV
+
48,262 MeV
8,937 keV
En = -316.8 eV
+
80,174 MeV
15,888 keV
En = -168.96 eV
+
74,740 MeV
15,888 keV
En = -108.16 eV
+
39,092 MeV
8,937 keV
En = -34.2 eV
+
16,111 MeV
3,972 keV
En = -6.72 eV
+
3,724 MeV
993 keV
En = -0.42 eV

$[1.2e20]]$

e

Determines the spectral line [KEM field energies] of electrons bound to them

The relativistic rest mass-energy-Matter of all periodic elements

is the sum of the mass-energies of all atomic nuclei and spectral lines that comprise its mass-Matter topology as measured in any spatial co-ordinate system per unit of time

the rest mass-Matter of bound photo-electrons is velocity invariant

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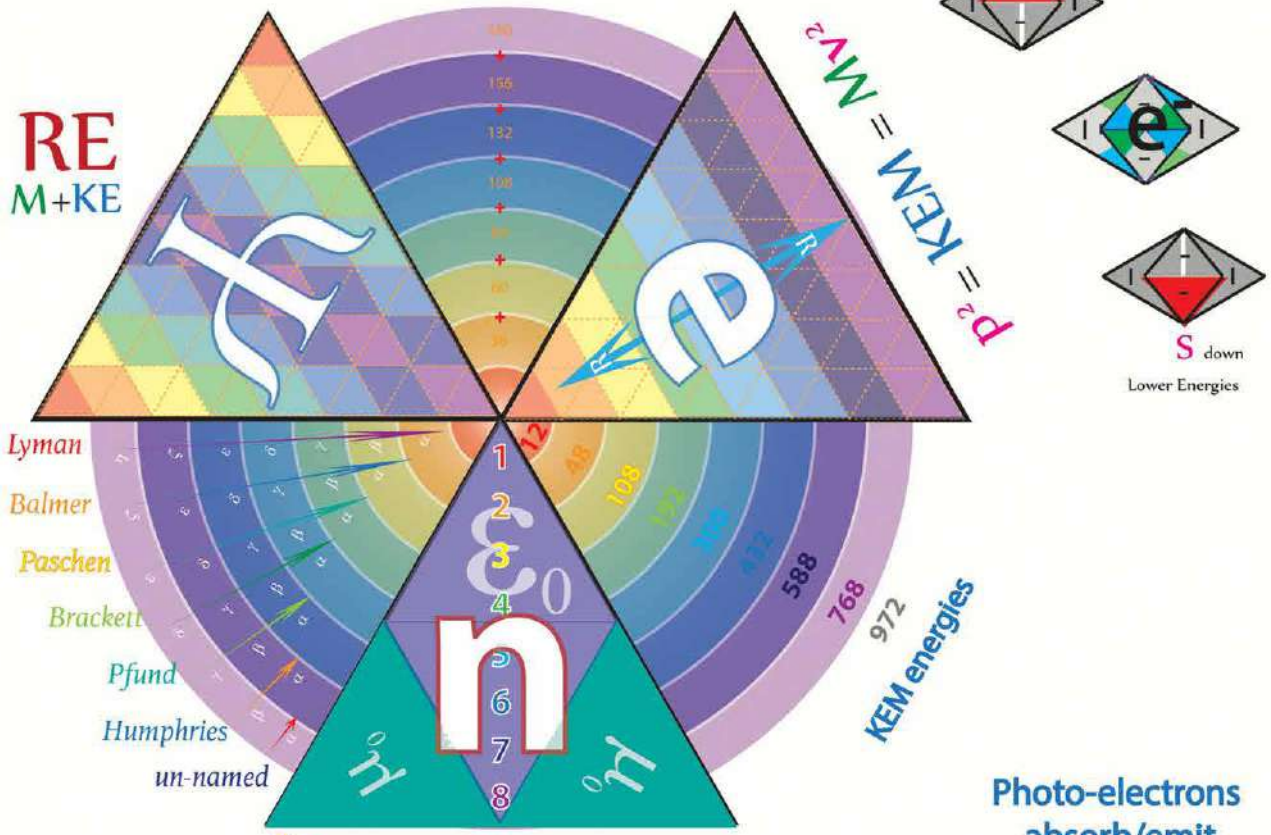
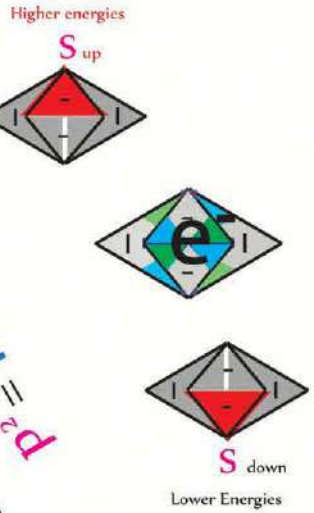
Ionisation energies

Fractional quantum differentials





Note: this is an Illustrative schema for modelling KEM field energies
All KEM fields possess the same physical spatial geometry
in radial-time defined spatial co-ordinate systems

c^2 c^4

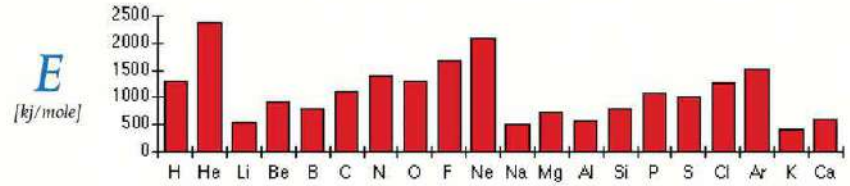
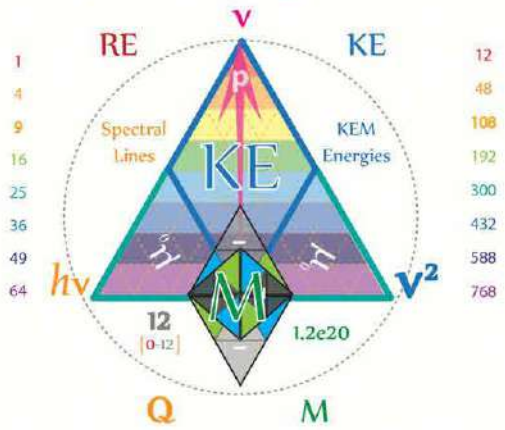


Photo-electrons absorb/emit spectral energies

$$E = eV = \frac{1}{4\pi\epsilon_0}\frac{ne^2}{a}$$

photo-electronic energy momenta

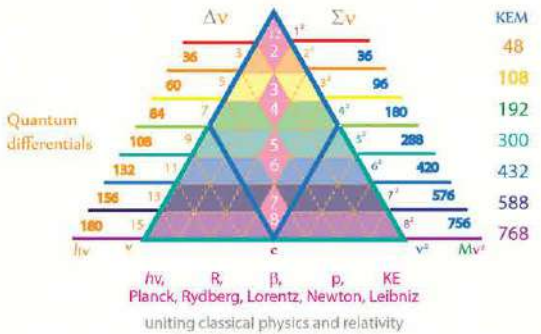


Mapping photo-electron transition energies to Tetryonic energy momenta geometries reveals many key facts about the ionisation energies of nuclei

$$E = -\frac{Z^2}{n^2}\frac{ke^2}{2a_0} = -\frac{13.6Z^2}{n^2}eV$$

The differing fractional KEM field energy momenta of electrons that results from their transitions to specific energy nuclei in elements results in differing QAM quanta and produces spectral lines and fine line splitting

Spectral line transitions


Δν
Σν
KEM
Quantum differentials
36 60 84 108 132 156 180
36 96 180 288 420 576 756
48 108 192 300 432 588 768
hν, R, β, p, KE
Planck, Rydberg, Lorentz, Newton, Leibniz

uniting classical physics and relativity through equilateral geometry

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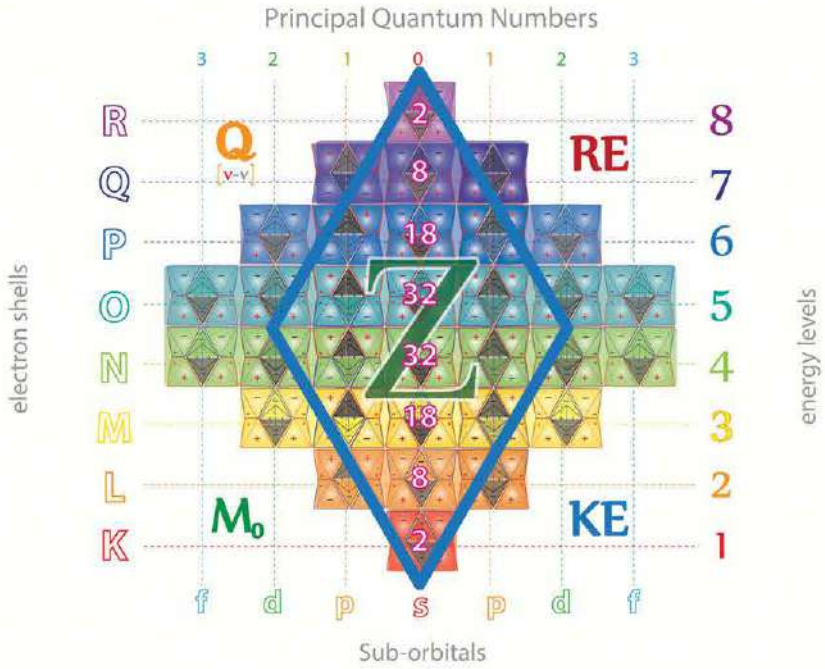
Element numbers

Nuclei per shell in elements follow a 'periodic summation rule' that is reflective of photonic energies

$$\sum_{K}^{R} 2(x^2) = 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2$$

$$Z$$

120	Unbinilium	n8
119	Ununennium	
118	Ununoctium	n7
87	Francium	
112	Copernicium	n6
55	Caesium	
102	Nobelium	n5
37	Rubidium	
70	Ytterbuim	n4
19	Potassium	
30	Zinc	n3
11	Sodium	
10	Neon	n2
3	Lithium	
2	Helium	n1
1	Deuterium	
Hydrogen	0	



Periodic mass-ENERGY-Matter

Following periodic summation rules for shell filling n[1-8] quantum energy deuterium nuclei combine to form elementary Matter

$$\sum_{K}^{R} \left[[72(n)^2] + [12e19] + [m_e v^2] \right]_{1}^{8} \quad (25 \text{ to } 32)$$

Baryon rest masses · lepton rest mass · KEM

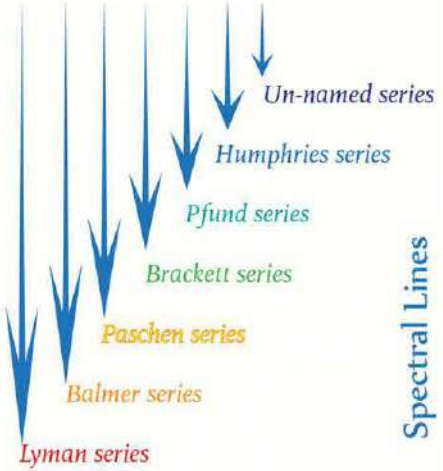
Deuterium mass-energy per shell

The measured weight of Matter in gravitational fields is the result of planar mass-energies in tetryonic standing-wave geometries

The periodicity of all the elements, along with their exact molar rest mass-energies and quantum wavefunctions can be described with Tetryonic geometries

Ionisation energies

$$\gamma$$



$$Mv^2 = KEM = hcR_H$$

Photon emission/absorption

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Spectral line differentials

$$\Delta hv = \Delta Mv = \Delta p$$

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

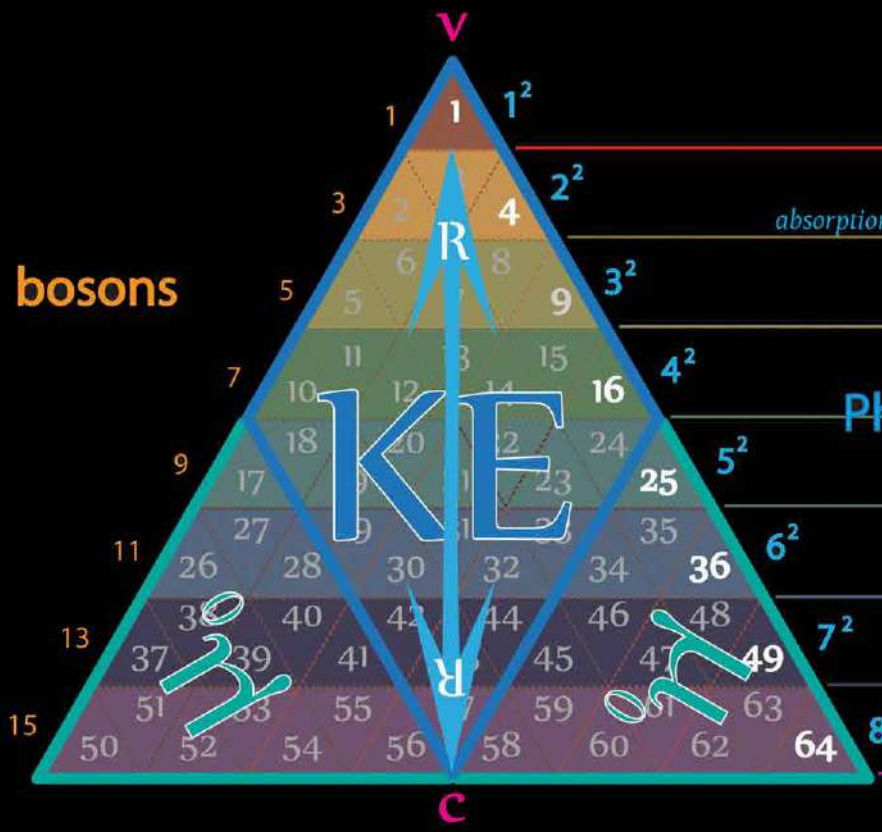
changes to energy momenta

accelerate photo-electrons

Ryberg's formula is
a mathematical description
of Tetryonic energy geometry

& produces spectral lines

Δhf



absorption $\frac{n_i^2}{n_f^2}$ **Fractional energy level transitions** $\frac{n_f^2}{n_i^2}$ emission

Photo-electrons

	Un-named	Humphries	Pfund	Brackett	Paschen	Balmer	Lyman
	15/64	28/64	39/64	48/64	55/64	60/64	63/64
		13/49	24/49	33/49	40/49	45/49	48/49
			11/36	20/36	27/36	32/36	35/36
				9/25	16/25	21/25	24/25
					7/16	12/16	15/16
						5/9	8/9
							3/4

Ryberg's constant reflects the changing
energy momentum of a transitioning electron

$$Mv^2 = KEM = hcR$$

All of the transitions of photo-electrons bound to Hydrogen atoms can now be revealed in the fractional geometry of KEM field energies

KEM field energies

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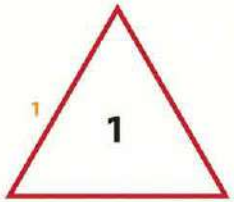
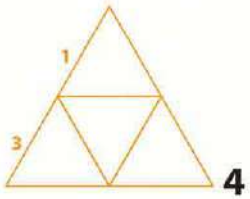
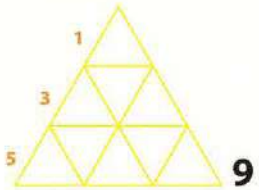
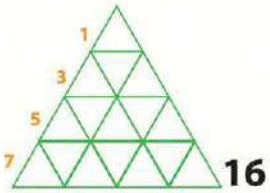
Fermat's method of Factoring

also known as 'the difference of two squares' is used to factorise large numbers









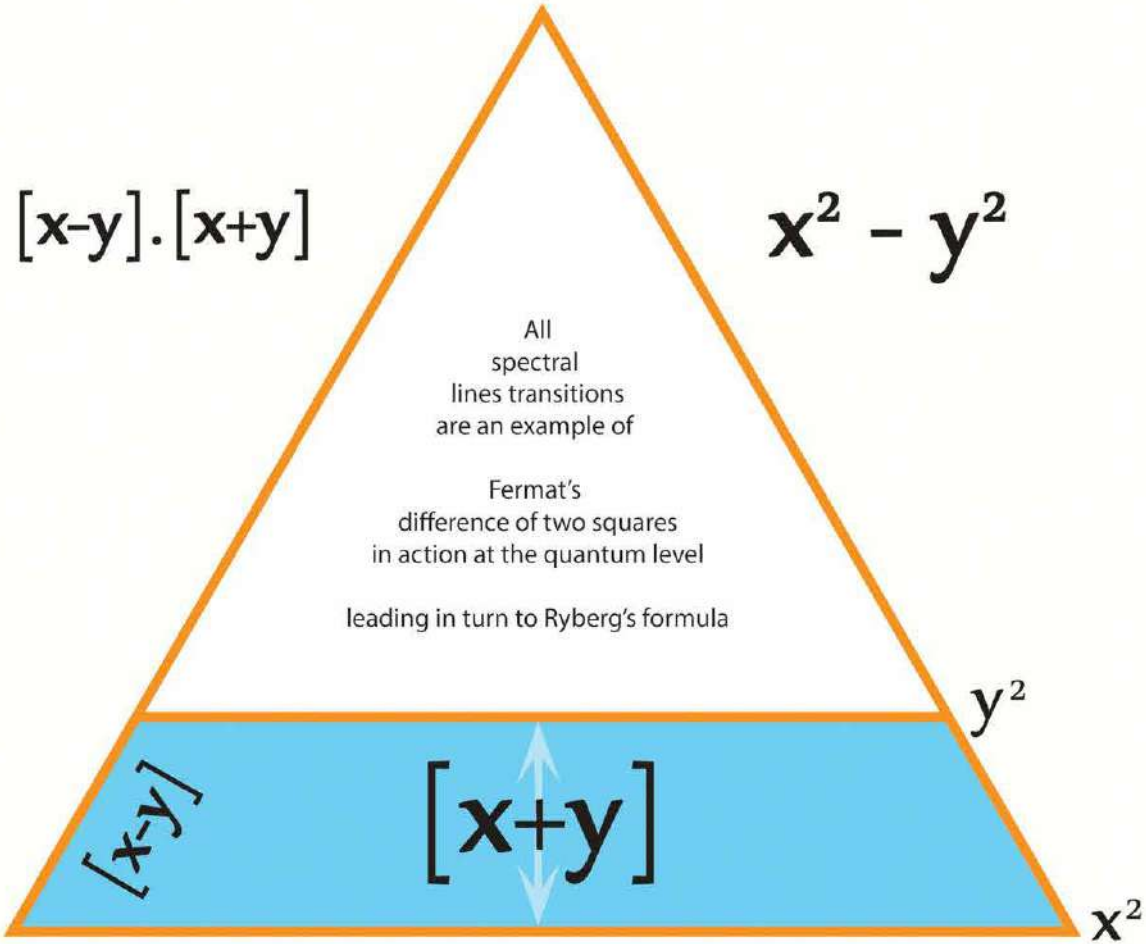
$[x-y].[x+y]$

$x^2 - y^2$

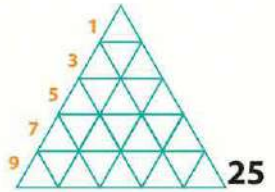
All
spectral
lines transitions
are an example of

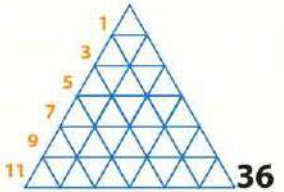
Fermat's
difference of two squares
in action at the quantum level

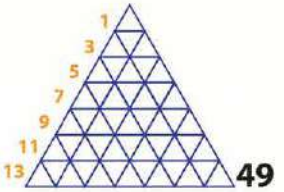
leading in turn to Ryberg's formula

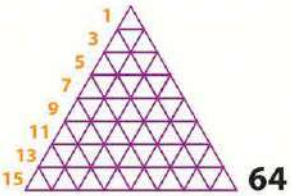


Fermat knew that every odd number could be written as the difference of two squares
or as revealed geometrically through Tetryonic theory's equilateral geometry,
every 'SQUARE' number is the sequential sum of ODD numbers









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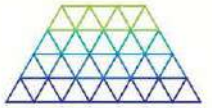
Fractions

A fraction is a number that shows how many equal parts there are

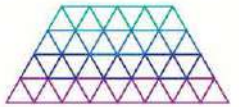
In quantum mechanics fractions appear in quantum steps
as a result of the equilateral geometry of Planck energy momenta

3/4

24/25



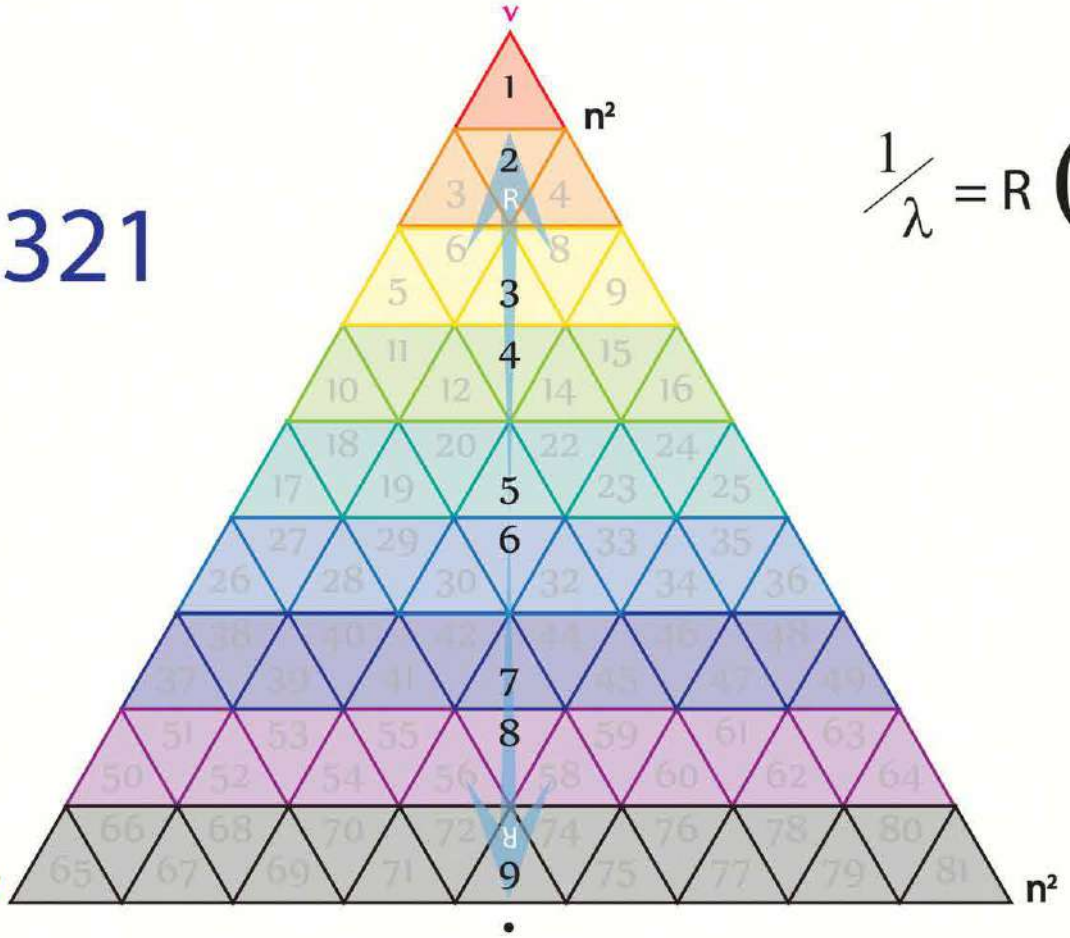
40/49



48/64

80/81

.987654321



$$\frac{1}{\lambda} = R\left(\frac{1}{1} - \frac{1}{81}\right)$$

.987654321

Cos 60

.5

1/2

Sin 60

.866025403

$\sqrt{3/2}$

Tetryonic geometry explains the fractional mathematics of Rydberg's formula

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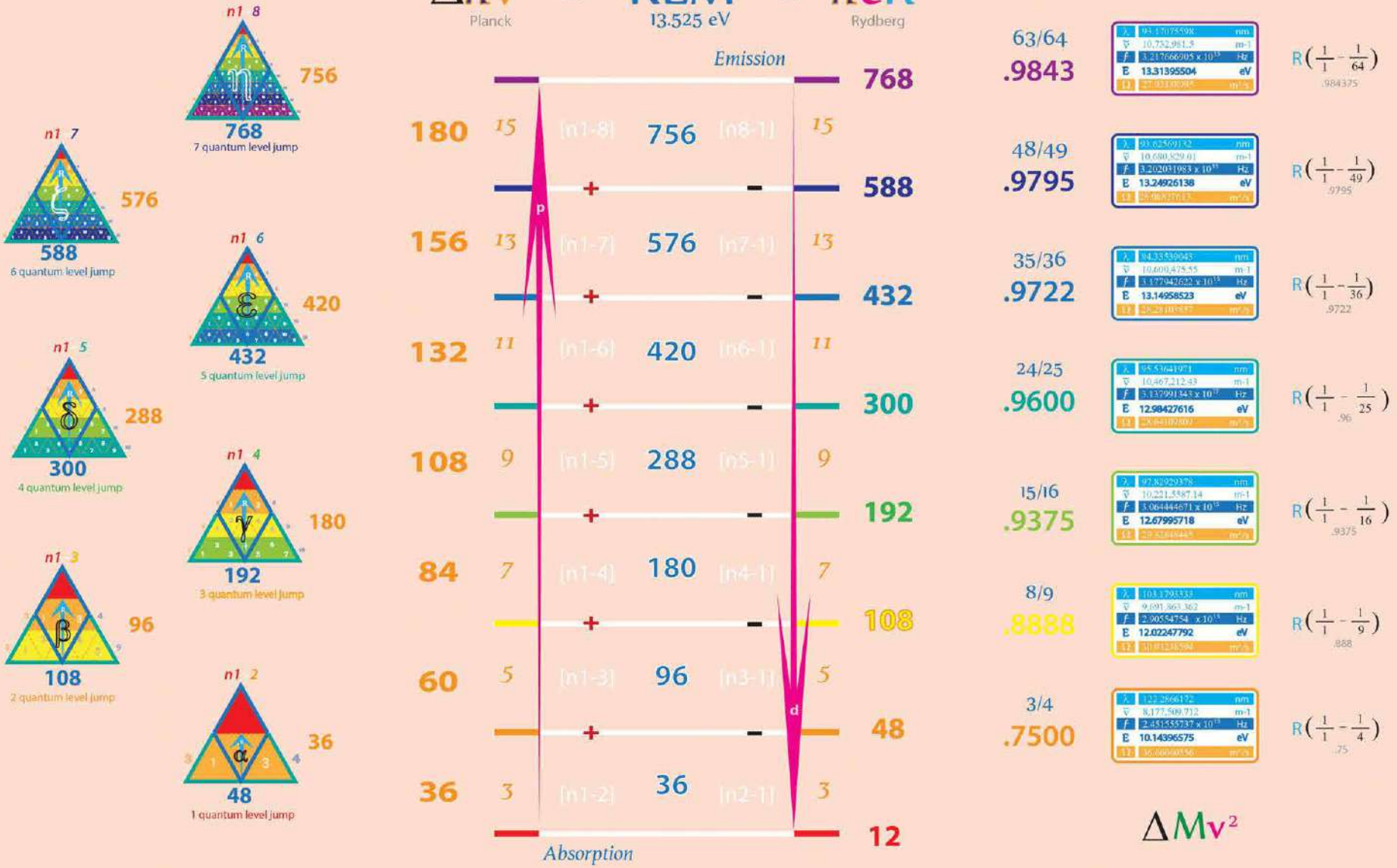
Lyman spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 13.525 eV — Rydberg



63/64	.9843	$R\left(\frac{1}{1}-\frac{1}{64}\right)$ .984375
48/49	.9795	$R\left(\frac{1}{1}-\frac{1}{49}\right)$ .9795
35/36	.9722	$R\left(\frac{1}{1}-\frac{1}{36}\right)$ .9722
24/25	.9600	$R\left(\frac{1}{1}-\frac{1}{25}\right)$ .96
15/16	.9375	$R\left(\frac{1}{1}-\frac{1}{16}\right)$ .9375
8/9	.8888	$R\left(\frac{1}{1}-\frac{1}{9}\right)$ .888
3/4	.7500	$R\left(\frac{1}{1}-\frac{1}{4}\right)$ .75

$$\Delta Mv^2$$

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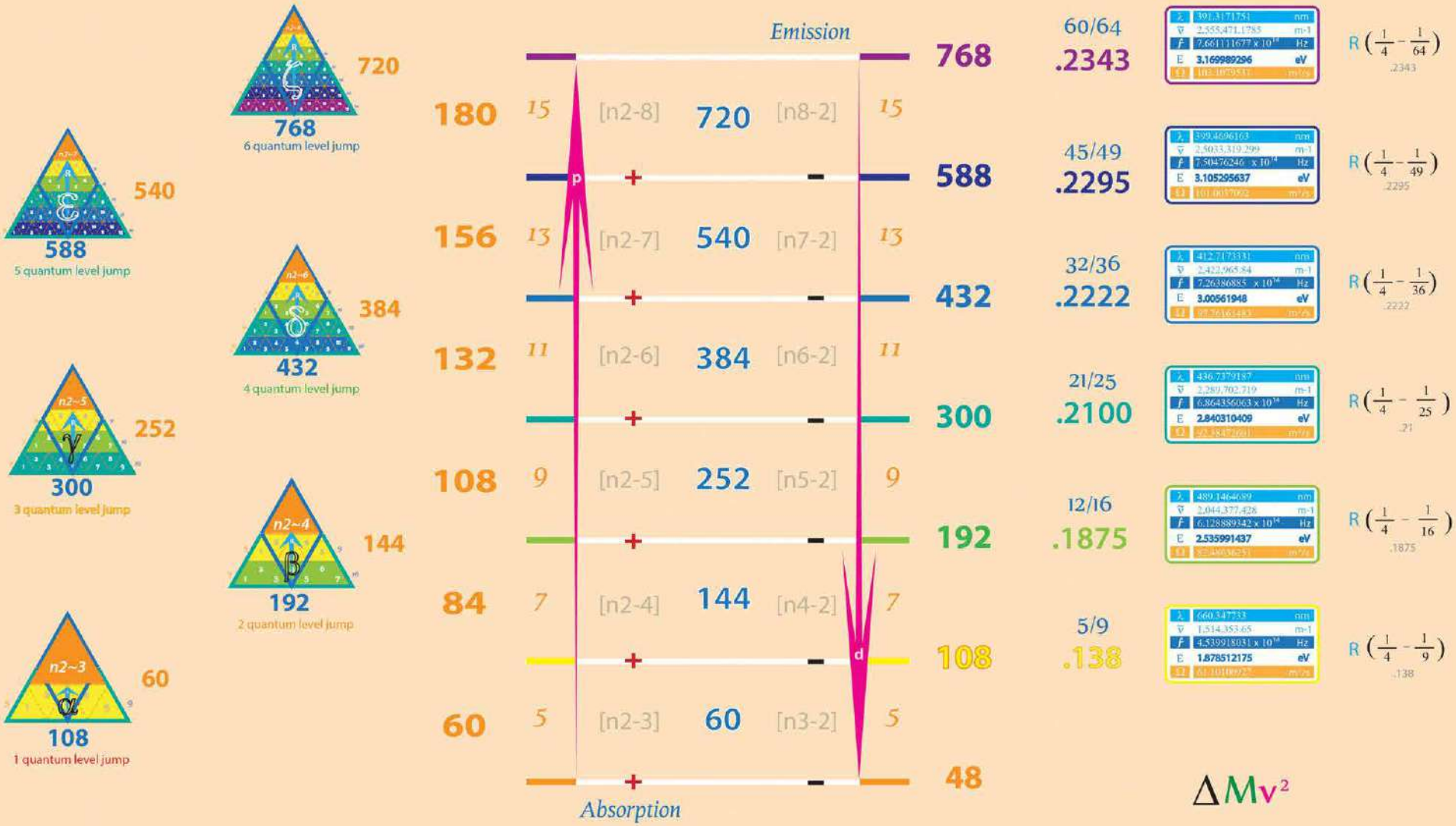
Balmer spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 3.381 eV — Rydberg



$R\left(\frac{1}{4}-\frac{1}{64}\right)$ .2343

$R\left(\frac{1}{4}-\frac{1}{49}\right)$ .2295

$R\left(\frac{1}{4}-\frac{1}{36}\right)$ .2222

$R\left(\frac{1}{4}-\frac{1}{25}\right)$ .21

$R\left(\frac{1}{4}-\frac{1}{16}\right)$ .1875

$R\left(\frac{1}{4}-\frac{1}{9}\right)$ .138

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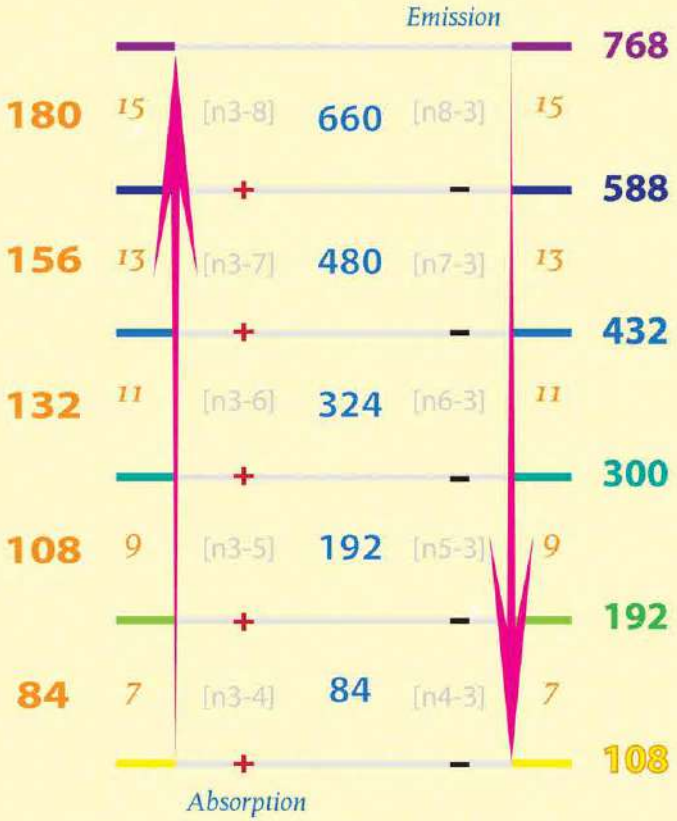
Paschen spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 1.502 eV — Rydberg



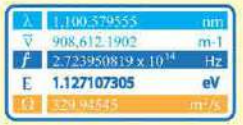
55/64
.0954

$R\left(\frac{1}{9}-\frac{1}{64}\right)$ .09548

40/49
.0907

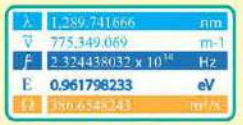
$R\left(\frac{1}{9}-\frac{1}{49}\right)$ .0907

27/36
.8033



$R\left(\frac{1}{9}-\frac{1}{36}\right)$ .0833

16/25
.0711



$R\left(\frac{1}{9}-\frac{1}{25}\right)$ .0711

7/16
.0486

$R\left(\frac{1}{9}-\frac{1}{16}\right)$ .0486

ΔMv^2

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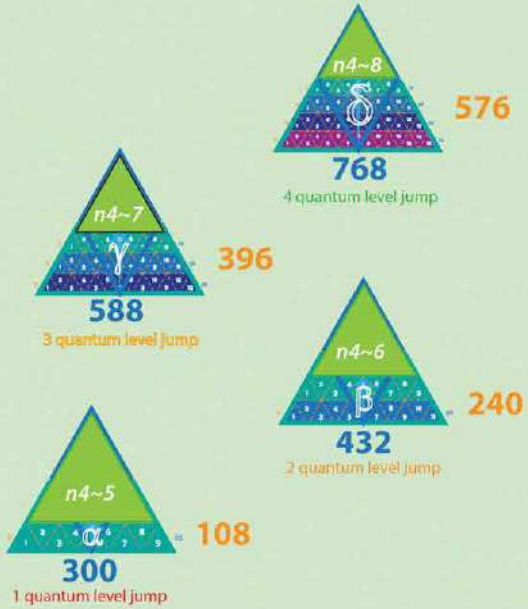
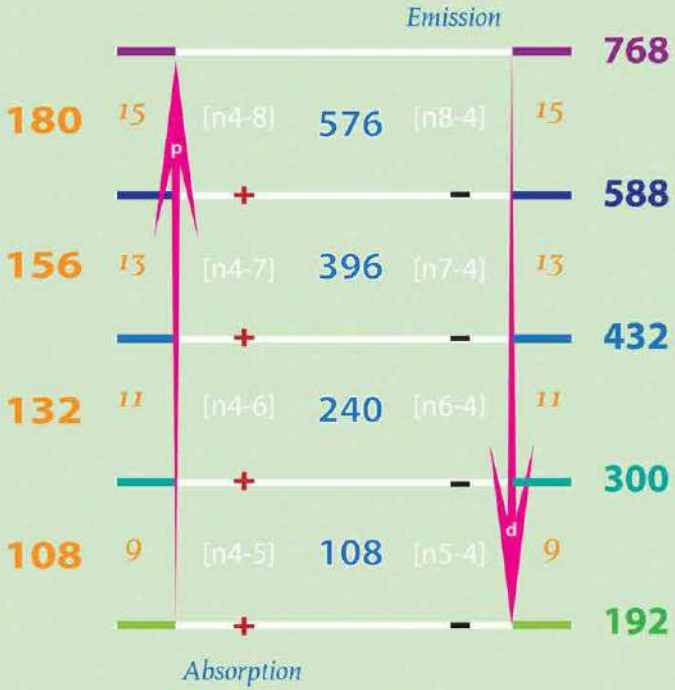
Brackett spectral transitions

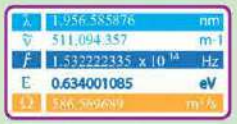
$$\Delta h\nu = KEM = hcR$$

Planck — 0.8451 eV — Rydberg



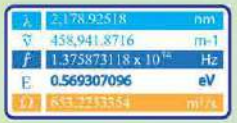


48/64 .0468



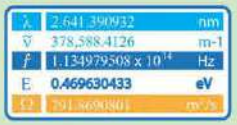
$R\left(\frac{1}{16}-\frac{1}{64}\right)$ .0468

33/49 .04209



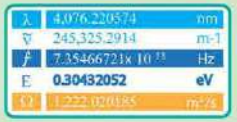
$R\left(\frac{1}{16}-\frac{1}{49}\right)$ .04209

20/36 .0347



$R\left(\frac{1}{16}-\frac{1}{36}\right)$ .0347

9/25 .0225



$R\left(\frac{1}{16}-\frac{1}{25}\right)$ .0225

ΔMv^2

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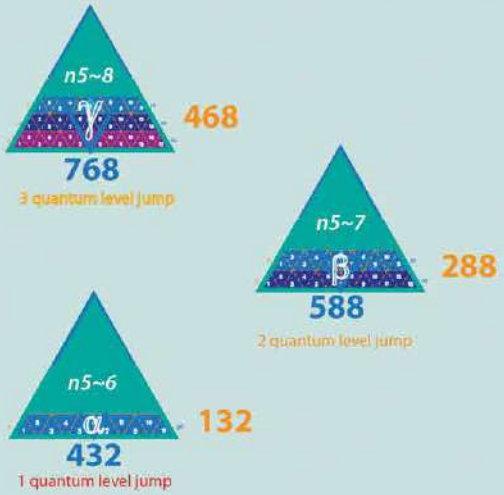
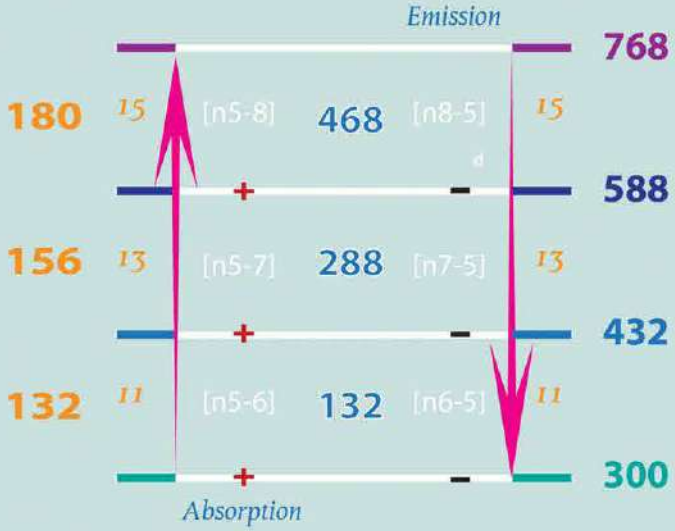
Pfund spectral transitions

$$\Delta h\nu = KEM = hcR$$

Planck — 0.541 eV — Rydberg





39/64 .0243

λ	3,762.665146 nm
ν̃	265,769.0656 m-1
f	7.967556145 x 10^13 Hz
E	0.329678886 eV
Ω	1,125.018633 m²/s

$R\left(\frac{1}{25}-\frac{1}{64}\right)$ .0243

24/49 .0195

λ	4,681.284566 nm
ν̃	213,616.5802 m-1
f	6.404063965 x 10^13 Hz
E	0.264985227 eV
Ω	1,403.413807 m²/s

$R\left(\frac{1}{25}-\frac{1}{49}\right)$ .01959

11/36 .0122

λ	7,503.951512 nm
ν̃	133,263.1212 m-1
f	3.995127867 x 10^13 Hz
E	0.165309071 eV
Ω	2,249.628068 m²/s

$R\left(\frac{1}{25}-\frac{1}{36}\right)$ .0122

ΔMv^2

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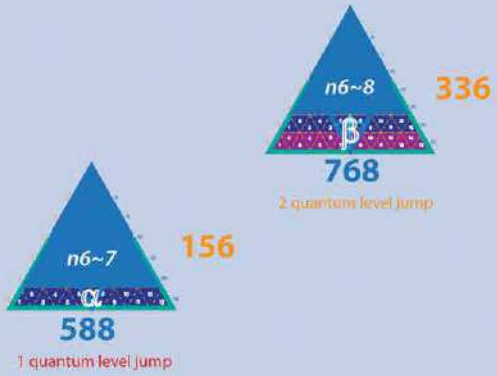
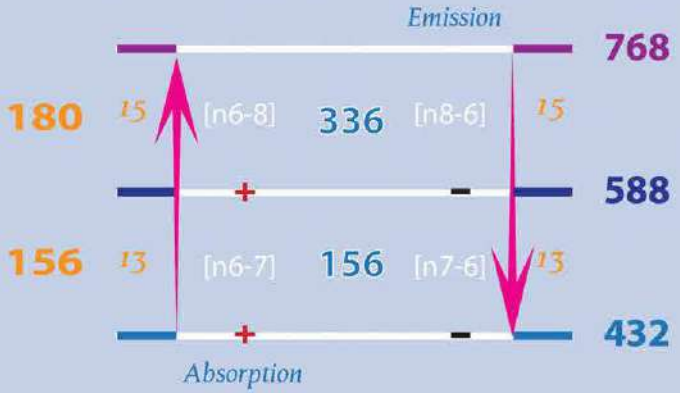
Humphreys spectral transitions

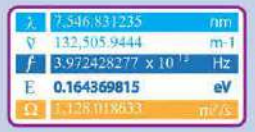
$$\Delta h\nu = KEM = hcR$$

Planck — 0.375 eV — Rydberg





28/64
.01215



$R\left(\frac{1}{36}-\frac{1}{64}\right)$ .01215

13/49
.00733

$R\left(\frac{1}{36}-\frac{1}{49}\right)$ .0073

ΔMv^2

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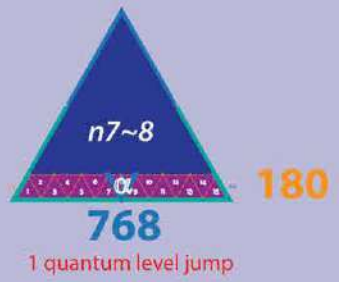
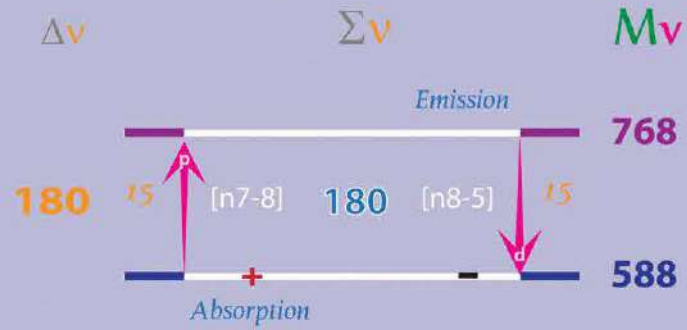
Un-named spectral transition

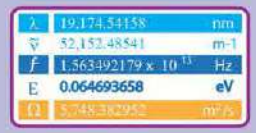
$$\Delta h\nu = KEM = hcR$$

Planck — 0.276 eV — Rydberg





15/64
.0047



$R\left(\frac{1}{49}-\frac{1}{64}\right)$ .0047

$\Delta M\nu^2$

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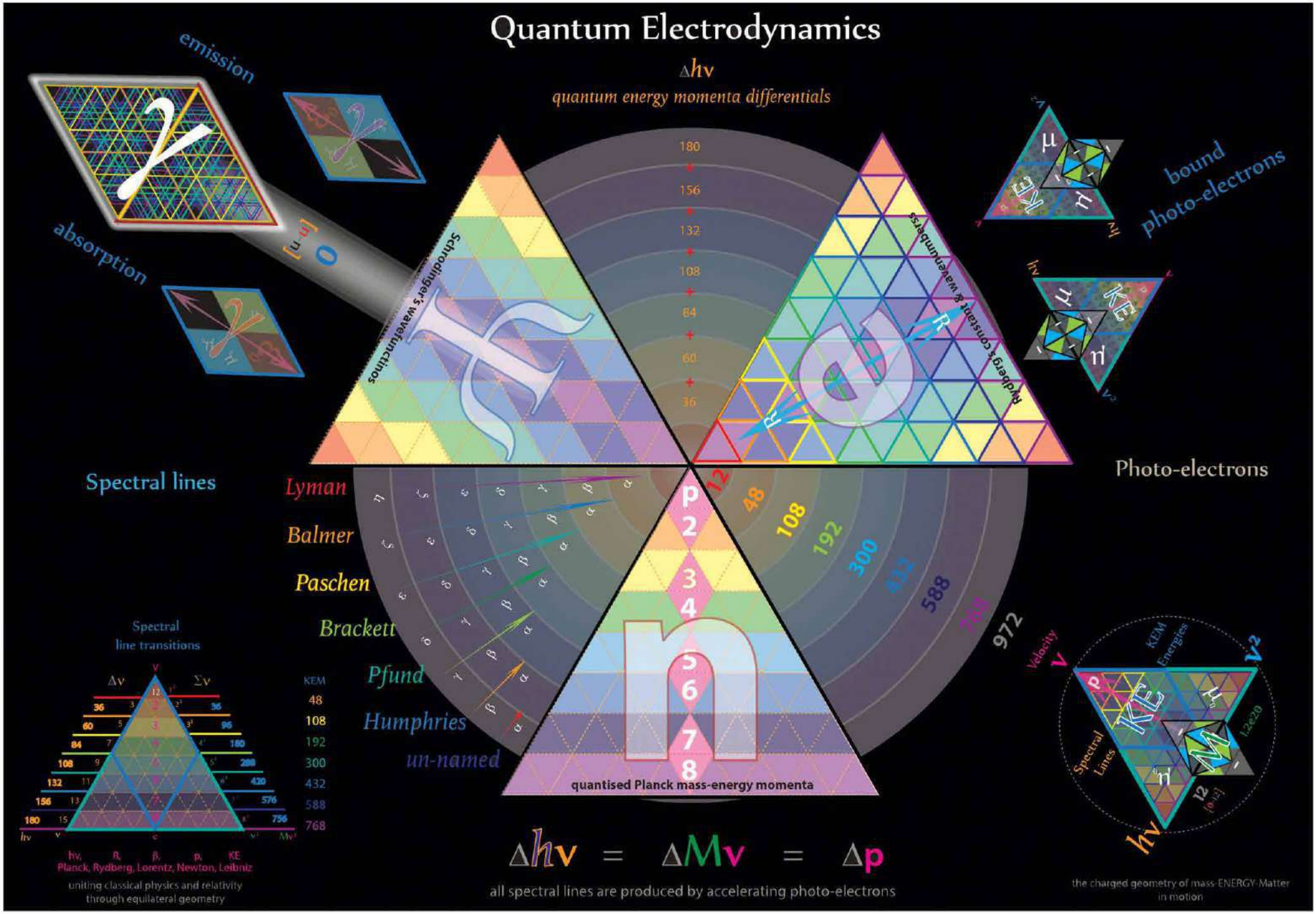

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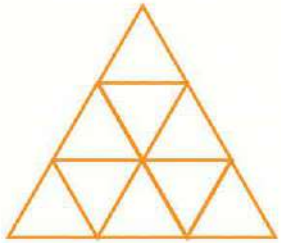
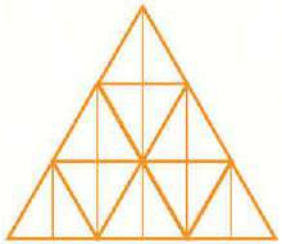
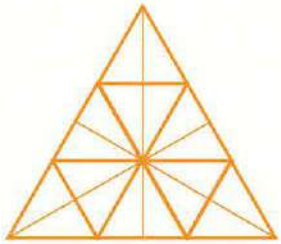
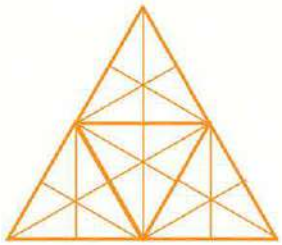
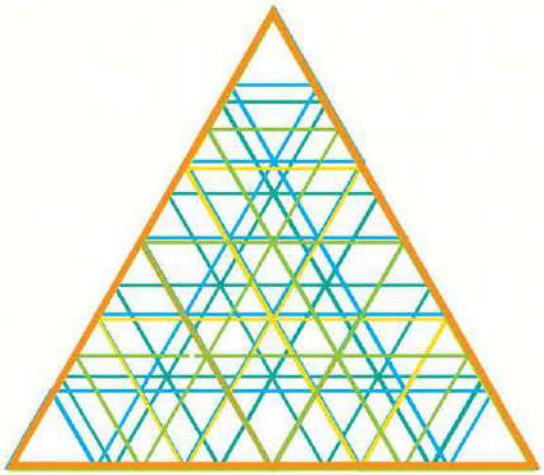

ninths


eigteenths

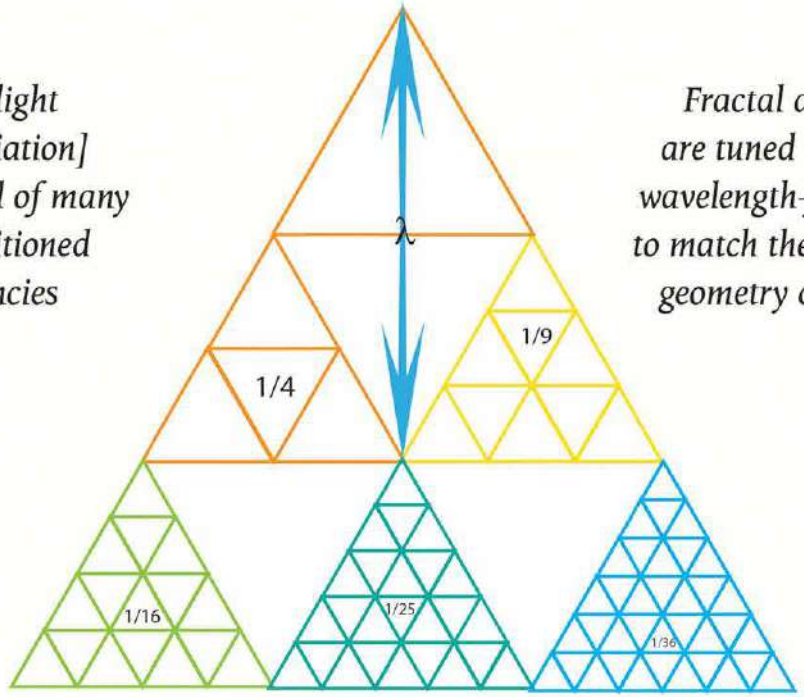

Eighteenths


Twenty-fourths

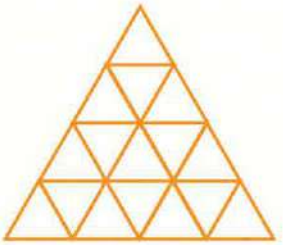


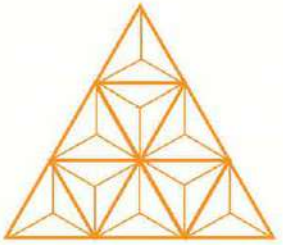
Fractionals and fractals

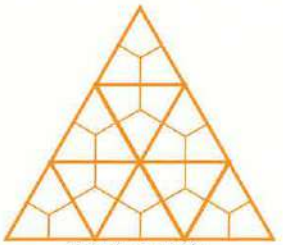
White light [EM radiation] is comprised of many superpositioned frequencies

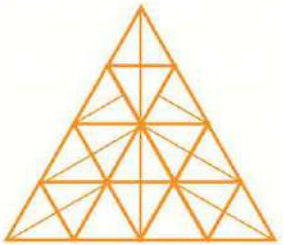


Fractal antennas are tuned to specific wavelength-frequencies to match the equilateral geometry of photons


Sizteenths


Twenty-sevenths


Twenty-sevenths


Thirty-seconds

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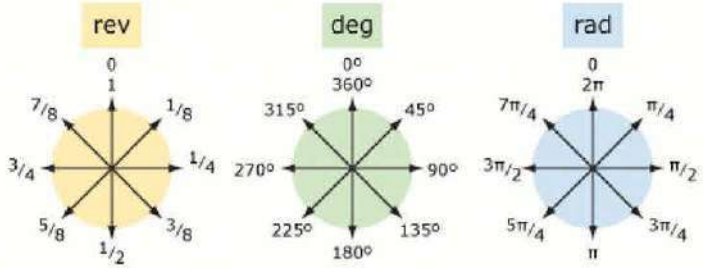
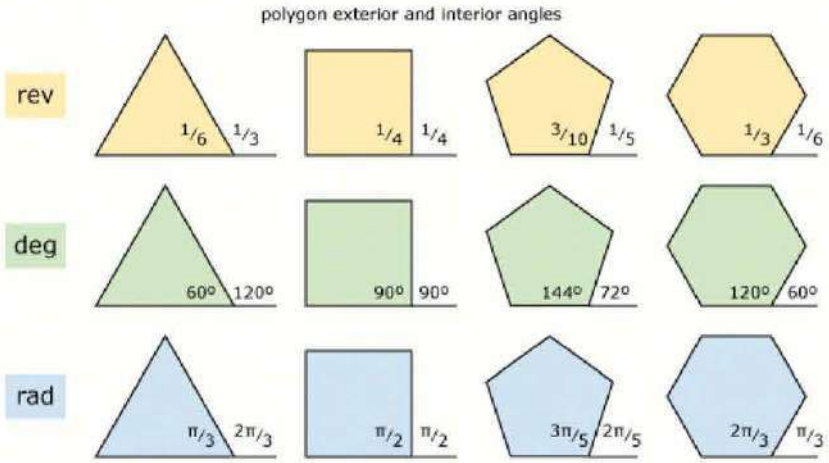
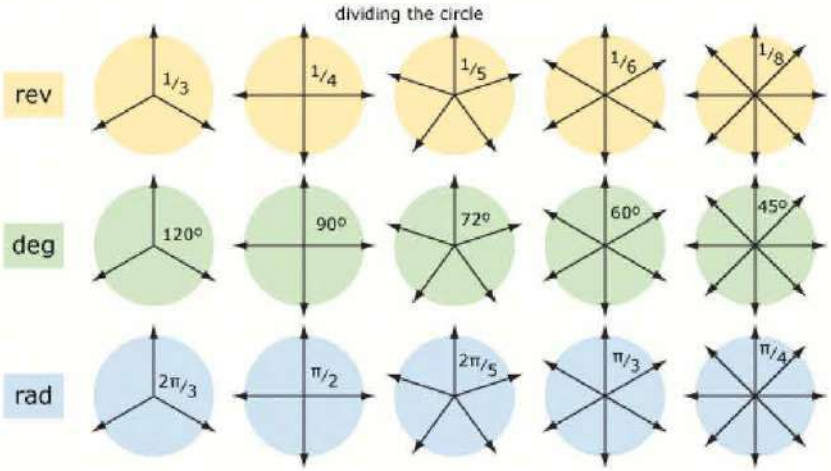
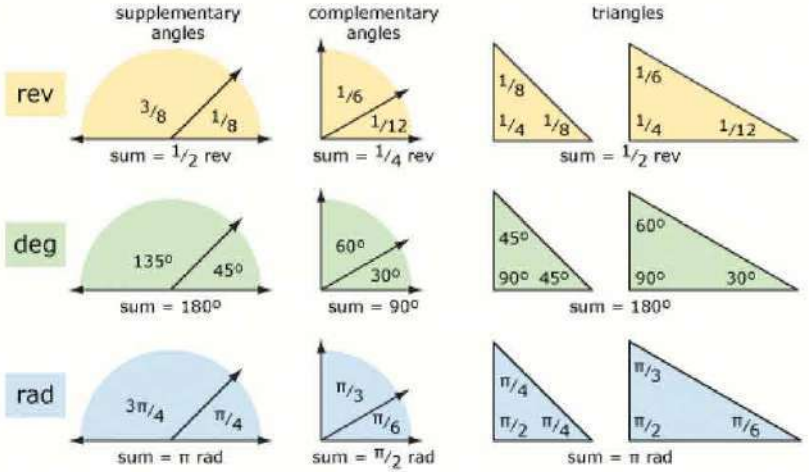
Polygons and Angles









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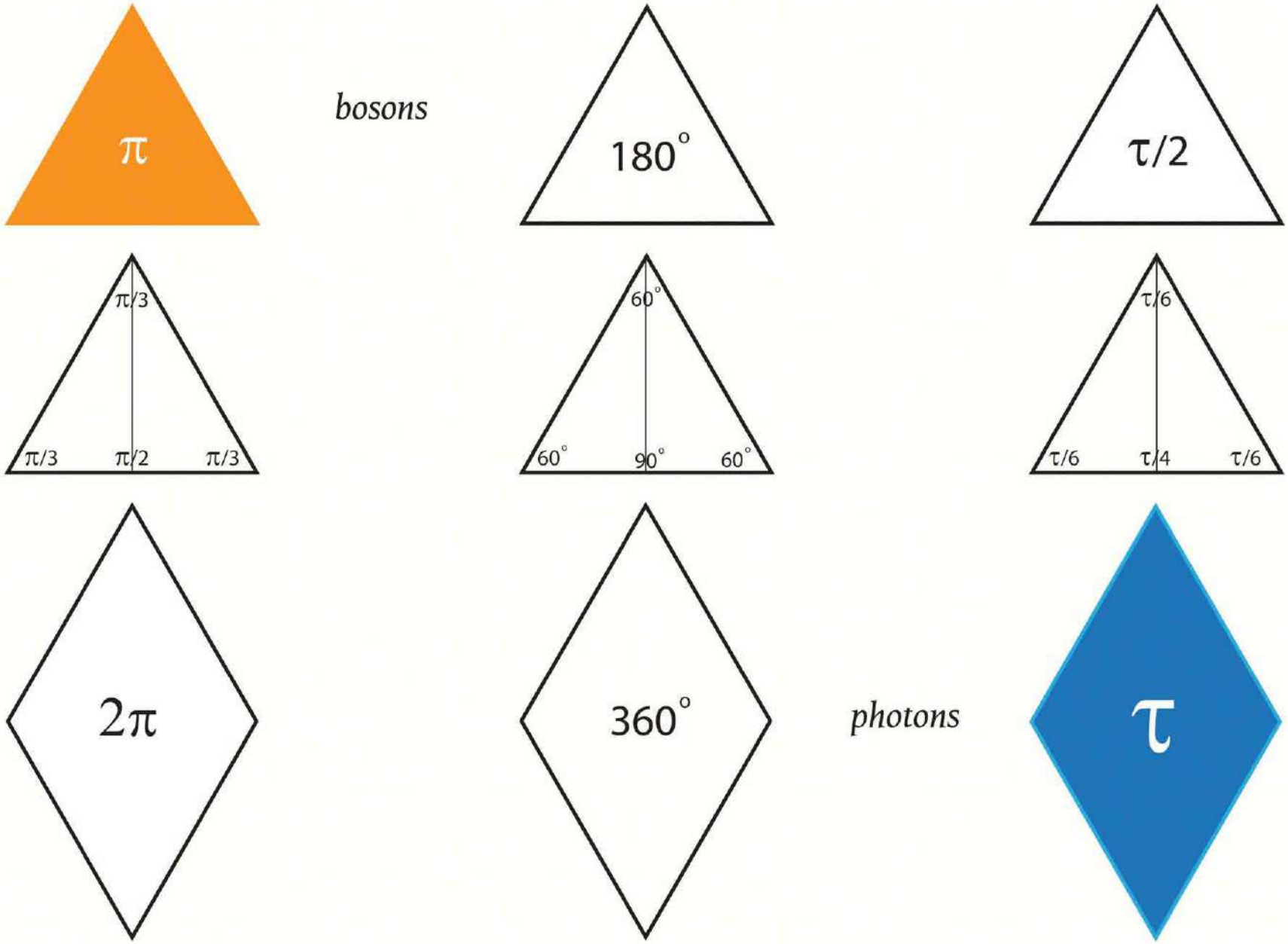
Pi vs Tau



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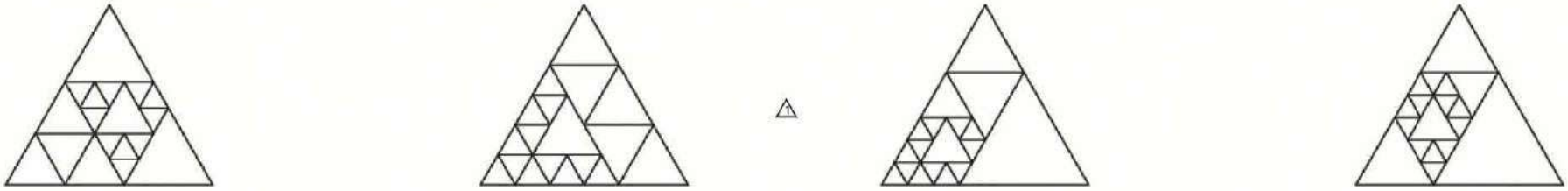
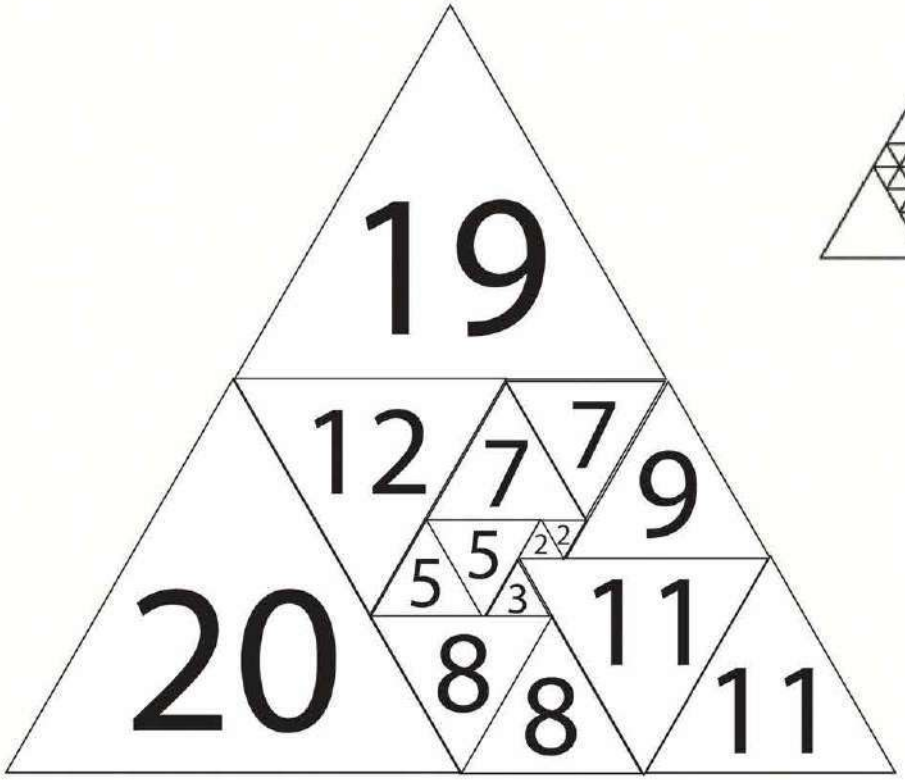
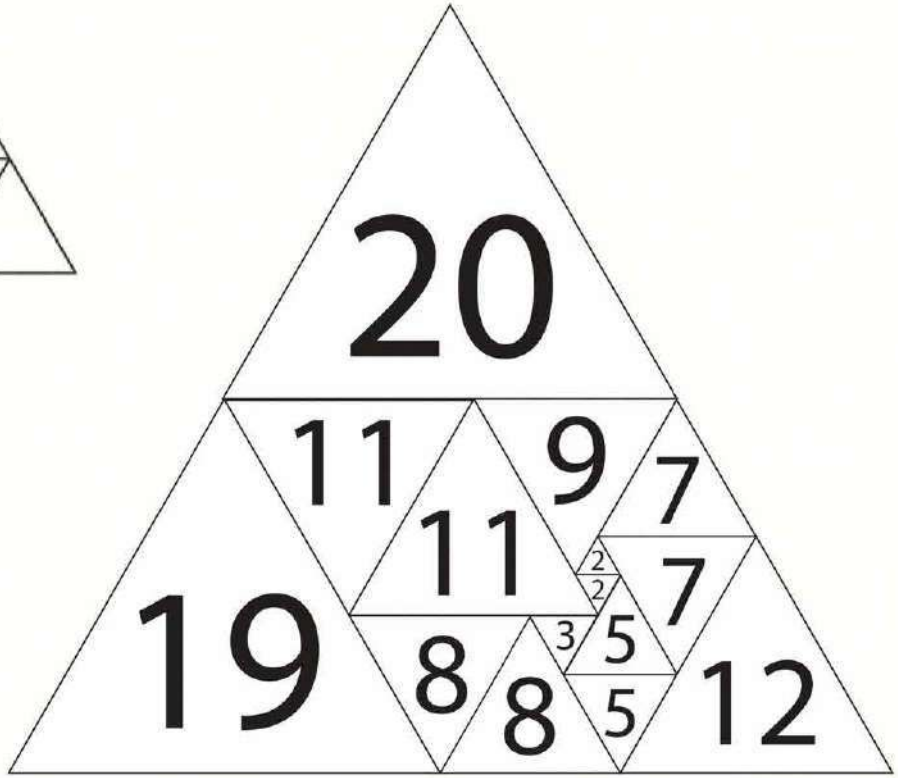
Triangular dissection of an equilateral triangle

is a way of dividing up a original triangle into smaller equilateral triangles,
such that none of the smaller triangles overlap





lowest order perfect equilateral triangle dissected by equilateral triangles



lowest order perfect dissected equilateral triangle, an isomer of the first

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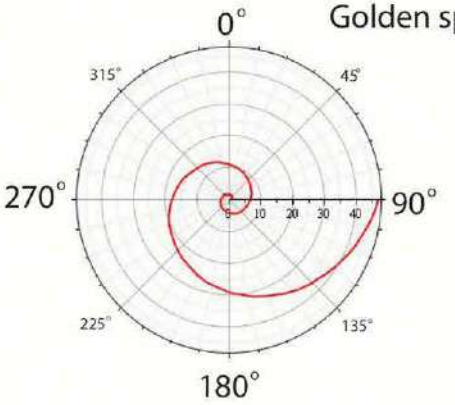
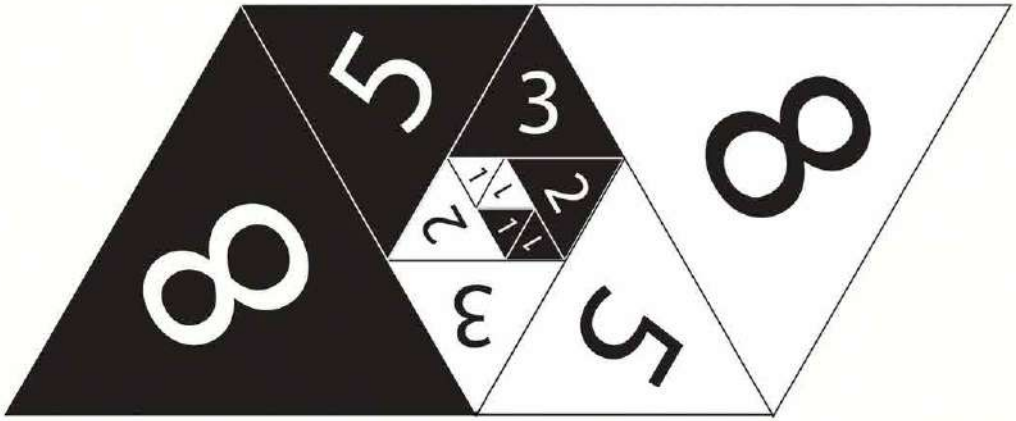
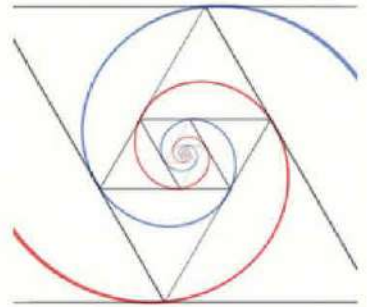
Golden mean Spirals

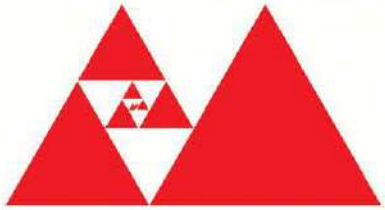
Golden Mean Spiral – This spiral is derived via the golden rectangle, a unique rectangle which has the golden ratio.
This form is found everywhere in nature: the Nautilus Shell, the face of a Sunflower, fingerprints, our DNA, and the shape of the Milky Way

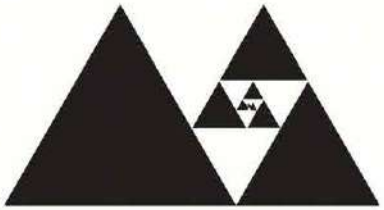


0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...









Continued fractions and the Fibonacci sequence

The convergence of the continued fractions

$$1 + \cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cdots}}}}}}}}}}}}}}}}$$

are:

$$\frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, \frac{55}{34}, \frac{89}{55}, \frac{144}{89}, \frac{233}{144}, \frac{377}{233}, \frac{610}{377},$$

The Golden Ratio (Golden Mean, Golden Section)
is defined mathematically as:

$$\varphi = \frac{1+\sqrt{5}}{2} = 1.6180339887\ldots.$$

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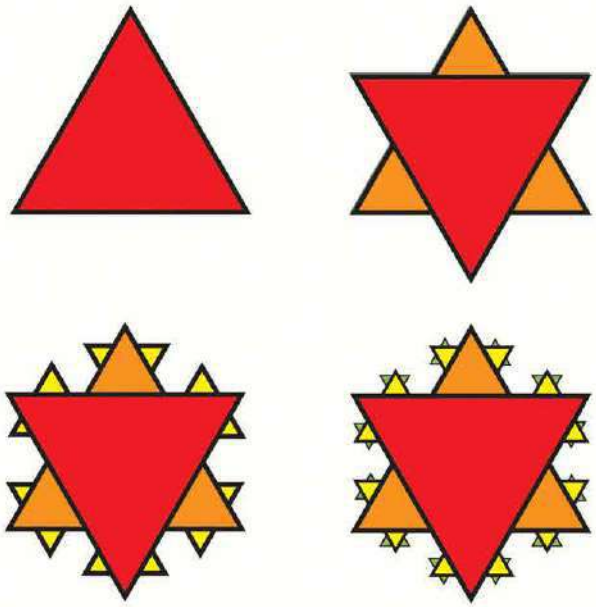
Koch fractal Curve

Niels Fabian Helge von Koch (January 25, 1870 – March 11, 1924) was a Swedish mathematician who gave his name to one of the earliest fractal curves ever known

He described the Koch curve, or Koch snowflakes as it popularly known, in a 1904 paper entitled "On a continuous curve without tangents constructible from elementary geometry"

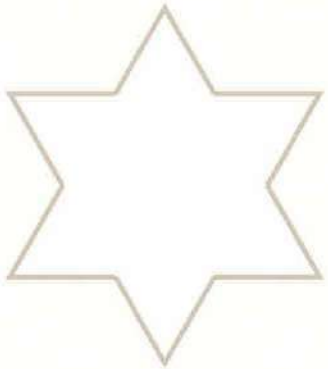
Von Koch wrote several papers on number theory . One of his results was a 1901 theorem proving that the Riemann hypothesis is equivalent to a strengthened form of the prime number theorem.

Three Koch curves form the snowflake.



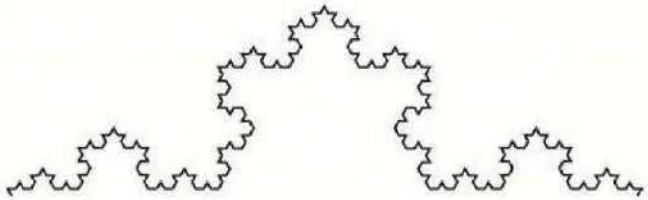
The Koch snowflake (or Koch star) is a mathematical curve and one of the earliest fractal curves to have been described.

Actually Koch described what is now known as the Koch curve, which is the same as the now popular snowflake, except it starts with a line segment instead of an equilateral triangle.

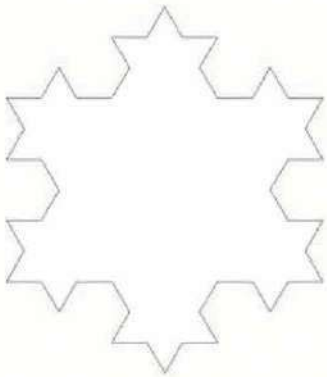


$$a = \frac{1}{2} + \frac{i}{\sqrt{12}}$$

The Koch curve is a special case of the Cesaro curve where:



which is in turn a special case of the de Rham curve.



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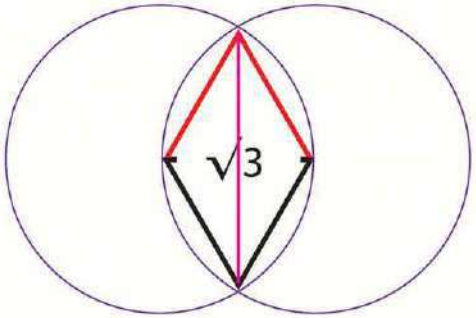
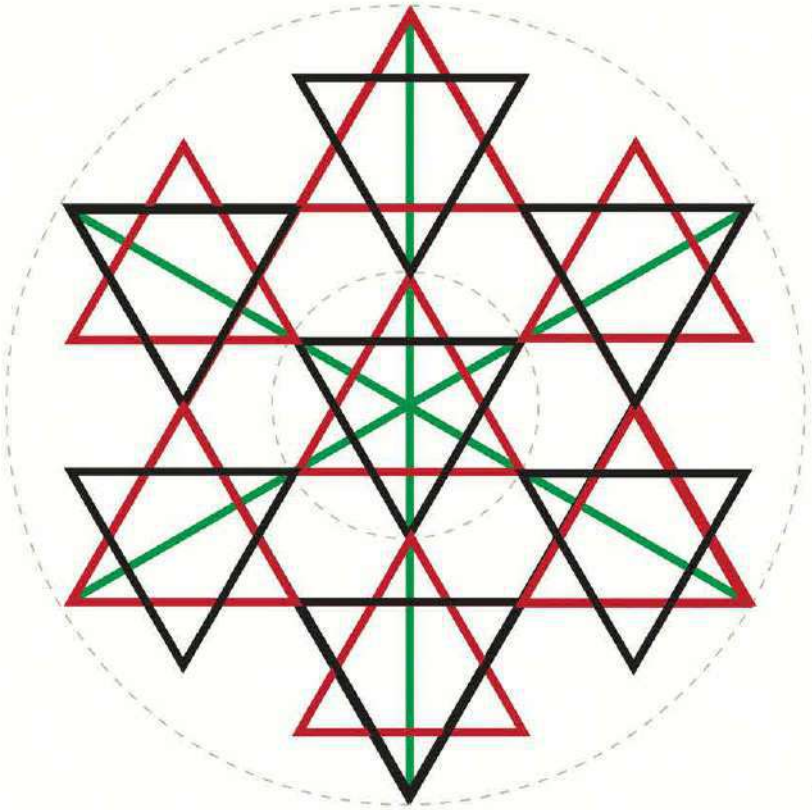


vesica piscis

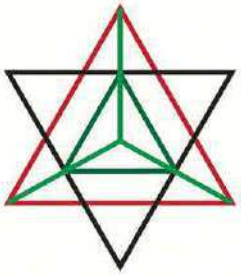
$$\frac{1351}{780} > \sqrt{3} > \frac{265}{153}\,.$$

Koch snowflake

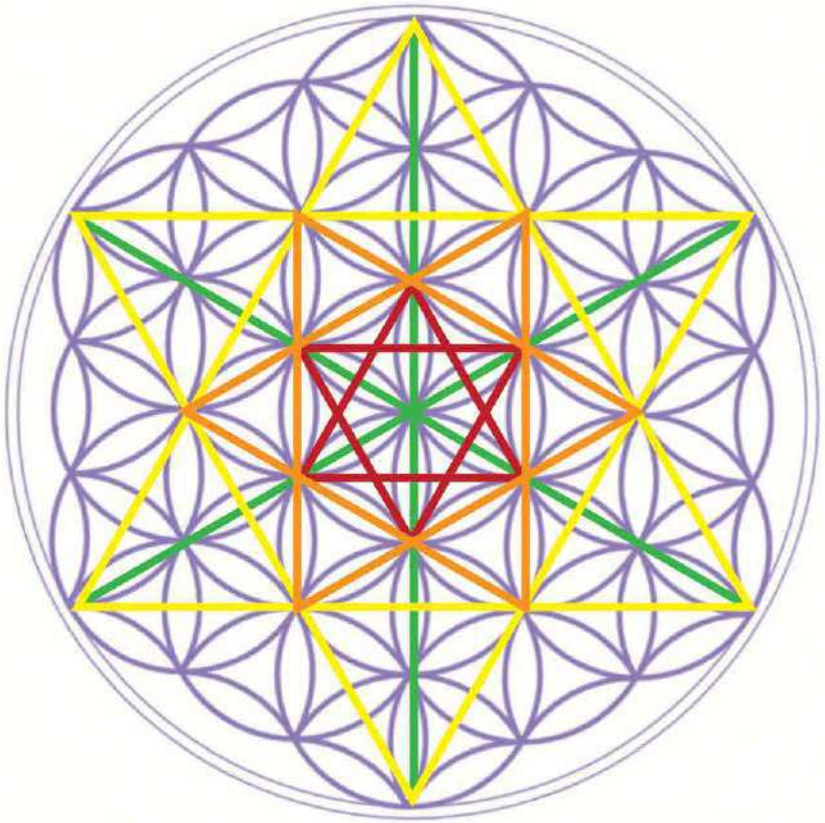


space-time

star tetrahedron



Flower of Life



The Flower of Life is a name for a geometrical figure composed of multiple evenly-spaced, overlapping circles.

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Unit circles - SINE WAVES - Photons

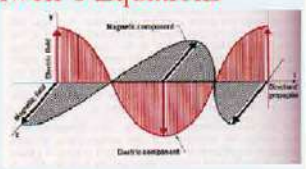
Maxwell's Equations

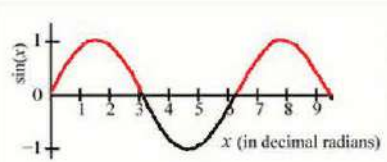
$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$

$\nabla \cdot \vec{D} = \rho$

$\nabla \times \vec{H} = \frac{\partial \vec{D}}{\partial t} + \vec{J}$

$\nabla \cdot \vec{B} = 0$





electric fields

Classic model of a photon

$e^{i\tau/4}$ $e^{i\tau/3}$ $e^{i\tau/6}$ $e^{i\tau/8}$ $e^{i\tau/12}$ $e^{i\tau/2}$ $e^{i\cdot 0}, e^{i\tau}$ $e^{i\cdot(3\tau/4)}$

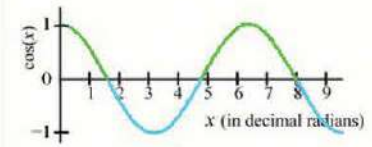
$e^{i\pi} = -1$

$i \equiv \sqrt{-1}$

N S N S

v

magnetic fields



Tetryonic model of a photon

Magnetic waveforms are 90 degrees out of phase with Electric waveforms

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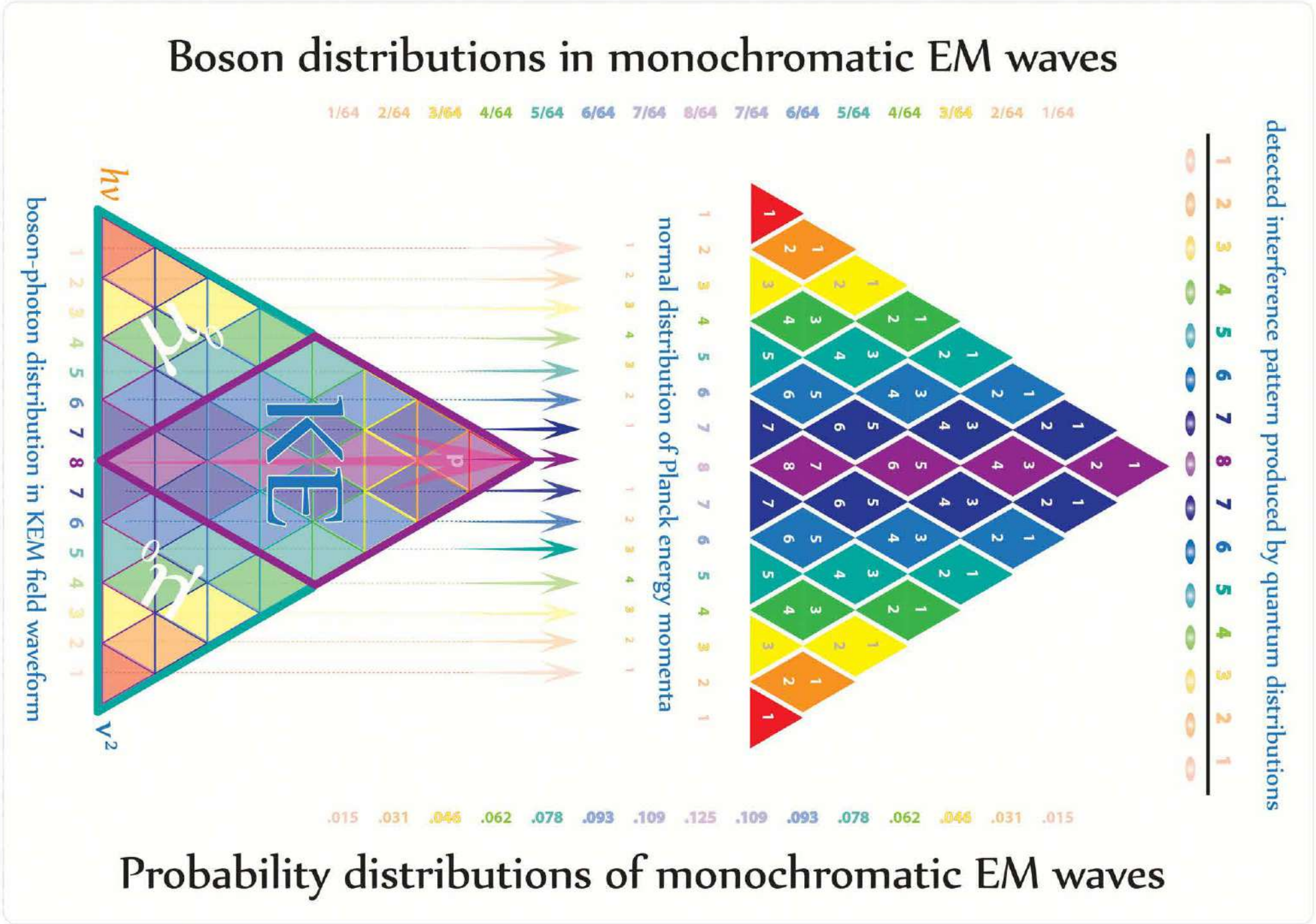
Boson distributions in monochromatic EM waves
1/64 2/64 3/64 4/64 5/64 6/64 7/64 8/64 7/64 6/64 5/64 4/64 3/64 2/64 1/64
detected interference pattern produced by quantum distributions
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
normal distribution of Planck energy momenta
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
boson-photon distribution in KEM field waveform
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
hν
KE
p
v²
.015 .031 .046 .062 .078 .093 .109 .125 .109 .093 .078 .062 .046 .031 .015
Probability distributions of monochromatic EM waves

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Wave interference patterns

The double-slit experiment, sometimes called Young's experiment, is a demonstration that matter and energy can display characteristics of both waves and particles, and demonstrates the fundamentally probabilistic nature of quantum mechanical phenomena and Establishes the quantum interference principle known as wave–particle duality.

Matter particles are stopped by the barrier but the [K]EM wave passes through both slits and is diffracted by them producing weaker EM waves that then superposition with each other to produce interference patterns

It is not the Particle passing through both slits that produces an interference pattern it is the particle's associated K[EM] wave

Equilateral superpositioned KEM waves produce constructive and destructive interference waves that have historically been interpreted as being circular wavefronts

photo-electron KEM wave photon intensities

The Compton frequency of any [K]EM wave is comprised of identical wavelength Photons which can combine to produce interference patterns

electrons will be stopped by the material barrier but their associated KEM field energy momenta will be absorbed by the screen and 'tunnel through' the barrier to contribute to the interference pattern

final interference pattern produced will depend on phase relationships of the two super-positioned wavefronts

Any detctor placed after the primary screen will remove energy from the secondaryKEM fields and affect the interference patterns produced

In the basic version of the experiment, a coherent light source such as a laser beam illuminates a thin plate pierced by two parallel slits, and the light passing through the slits is observed on a screen behind the plate. The wave nature of light causes the light waves passing through the two slits to interfere, producing bright and dark bands on the screen — a result that would not be expected if light consisted strictly of particles. However, on the screen, the light is always found to be absorbed as though it were composed of discrete particles or photons.

If one slit is observed for the passage of the electron in order to determine its physical state then the its KEM field wave will be absorbed by the detector resulting in only one wave remaining, enforcing a classical particle outcome

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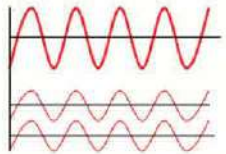
Quantum computing via EM wave super-positioning

BY superpositioning two beams
of EM radiation the resultant 'colours'
will perform quantum level computations
that can be read via the resultant
interference patterns produced

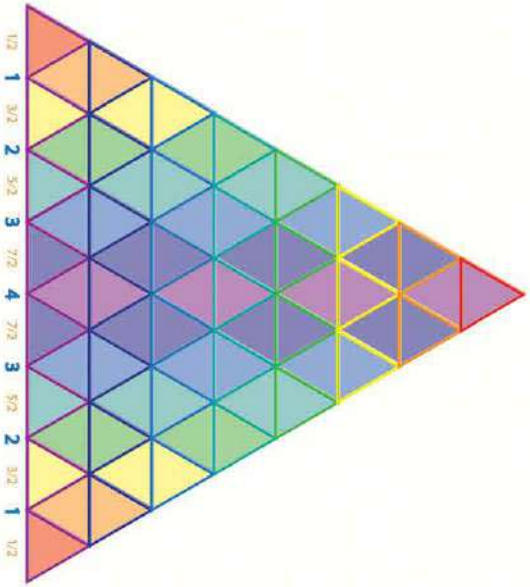


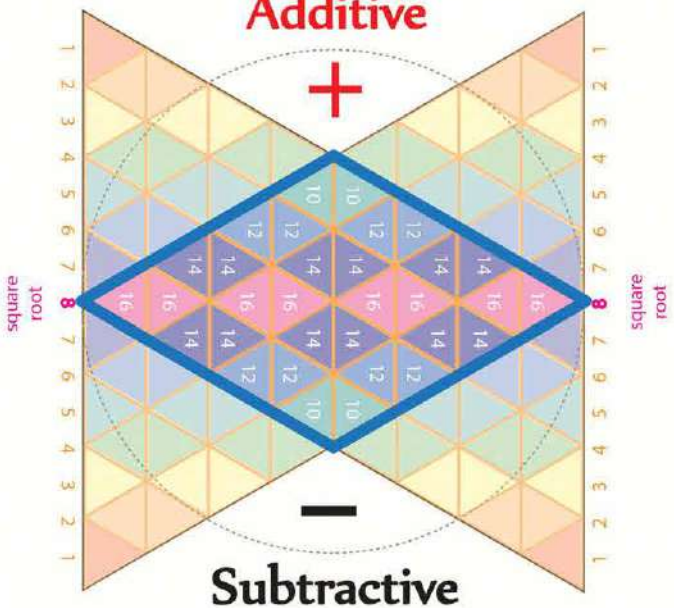
constructive interference

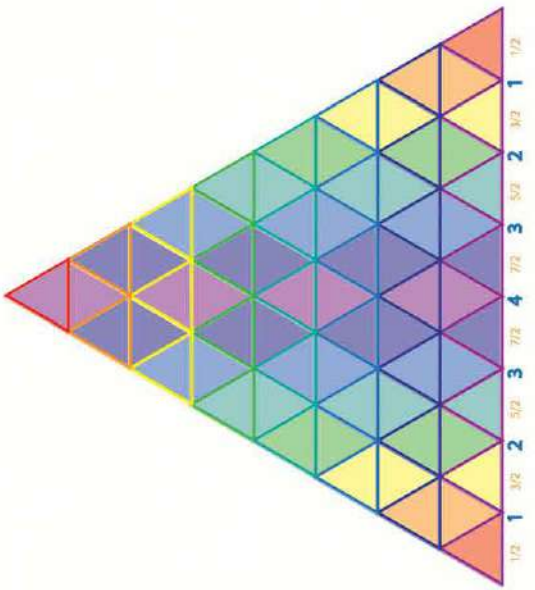
additive in-phase EM waves

In phase

Additive

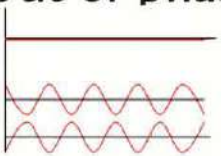






Subtractive

Out of phase



destructive interference

subtractive out-of-phase EM waves

Various basic operations, such as
ADDITION, SUBTRACTION and
SQUARE ROOTS etc
are all easily computed using
EM wave super-positioning

The lines of Force

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By utilising the statiscal distribution of equilateral Planck energy momenta quanta in EM waves
Tetryonic theory provides a practical geometric solution to quantum computing problems

P vs. NP

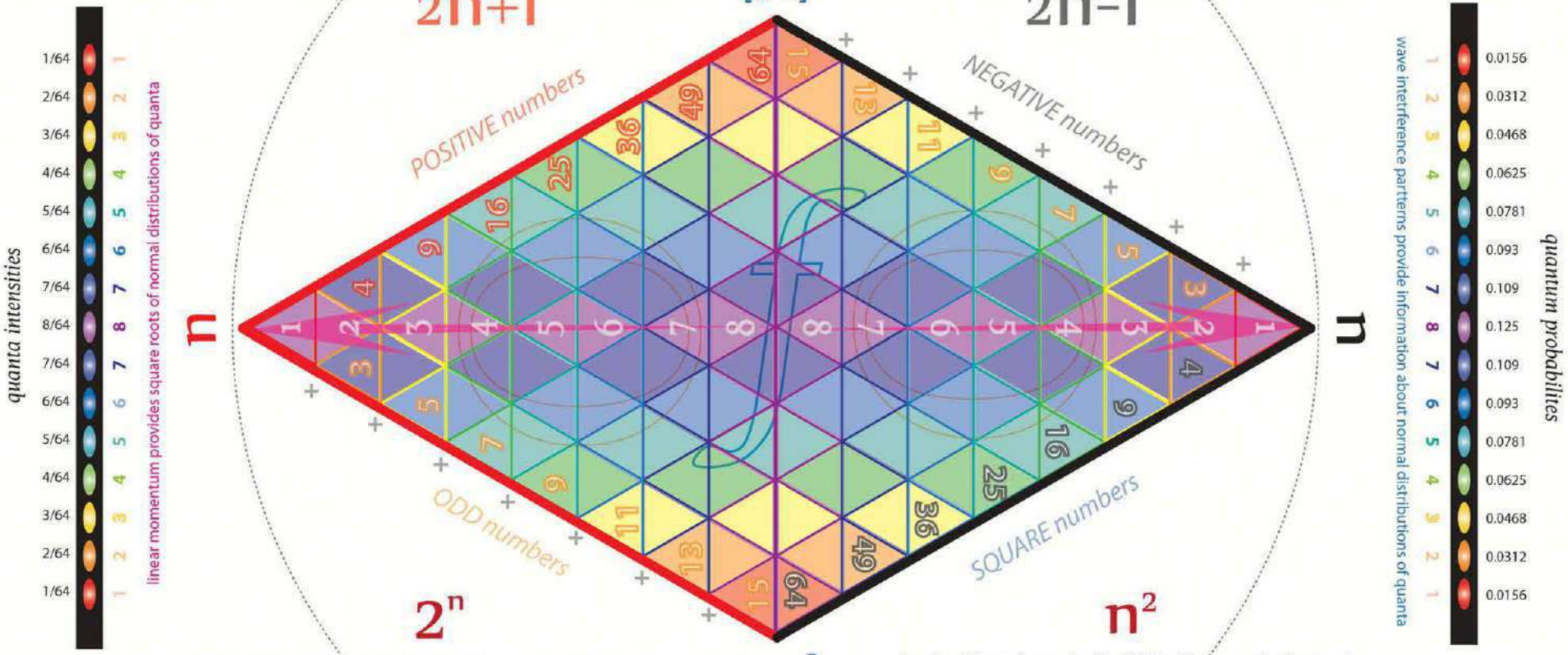
The set of all decision problems for which an algorithm exists which can be carried out by a deterministic Turing machine in polynomial time

the set of all decision problems for which an algorithm exists which can be carried out by a non-deterministic Turing machine in polynomial time

An algorithm of time complexity ***O(n)*** is one which increases in time linearly as the "size of the problem" (whatever n stands for) increases.

q
bosons

E
photons



An algorithm of complexity ***O(2ⁿ)*** utlises exponential quanta; increasing n by 1 will double the quanta required

An algorithm of complexity ***O(n²)*** utilises quadratic quanta, meaning that if you double n it will use four times as many quanta.

Unlike Math treatise on P vs Np that require exponential polynomial time ***O(nᵏ)*** Tetryonic geometry of EM fields utilise exponential energies per second

1 second

2hv

hf

By relating p to the number of equilateral wave fields in any EM wave very large [pn²] data sets can be modelled and processed every second

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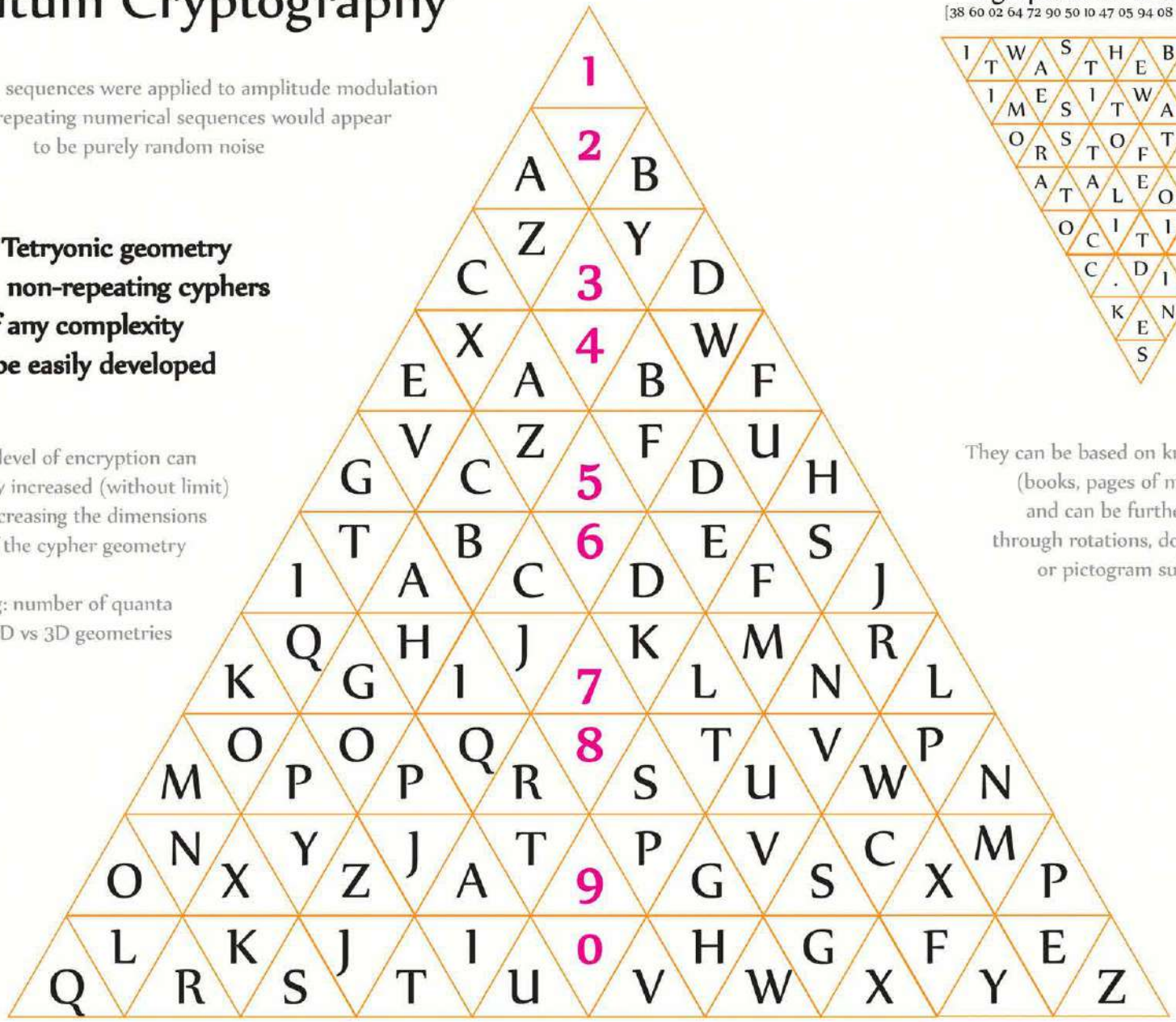
Quantum Cryptography

If the numerical sequences were applied to amplitude modulation their non-repeating numerical sequences would appear to be purely random noise

Using Tetryonic geometry advanced non-repeating cyphers of any complexity can be easily developed

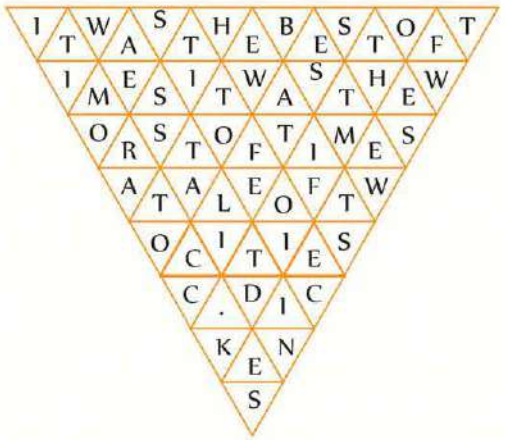
The level of encryption can be easily increased (without limit) by increasing the dimensions of the cypher geometry

eg: number of quanta 2D vs 3D geometries


1
2
A B
Z Y
C 3 D
X 4 W
E A B F
V Z F U
G C 5 D H
T B 6 E S
I A C D F J
Q H J K M R
K G I 7 L N L
O O Q 8 T V P
M P P R S U W N
N Y J T P V C M
O X Z A 9 G S X P
L K J I 0 H G F E
Q R S T U V W X Y Z

eg: quantum encryption 1024

[38 60 02 64 72 90 50 10 47 05 94 08 48 52 27 26 51 66 01 91 03 20]



They can be based on known letter sources (books, pages of magazines etc) and can be further encrypted through rotations, double encrypting or pictogram substitutions

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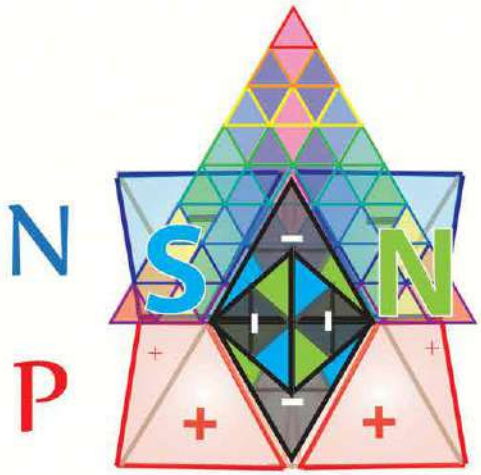
Quantum Computing

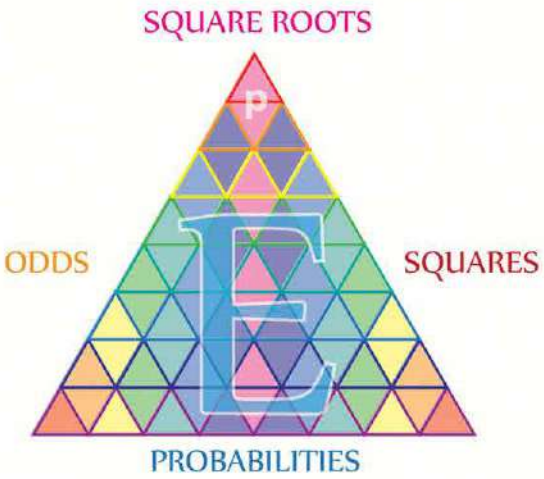
The Proton/Neutron geometries of atomic nuclei can be built at the quantum scale
to create an atomic nuclei that can operate as a Opto-memory-transistive computing element,
many elements can then be combined in lattices to create super computers no larger than bacterium

Spin UP

Energy can be gated through individual nuclei
using the centre Baryon as the base transistor element,
in turn effecting the energies of bound photo-electrons

Spin DOWN





Q-bits

photo-electronic transitions can be used to directly recieve
or emit memory states through the absorption and emission
of spectral photons of specific energy momenta

1

0

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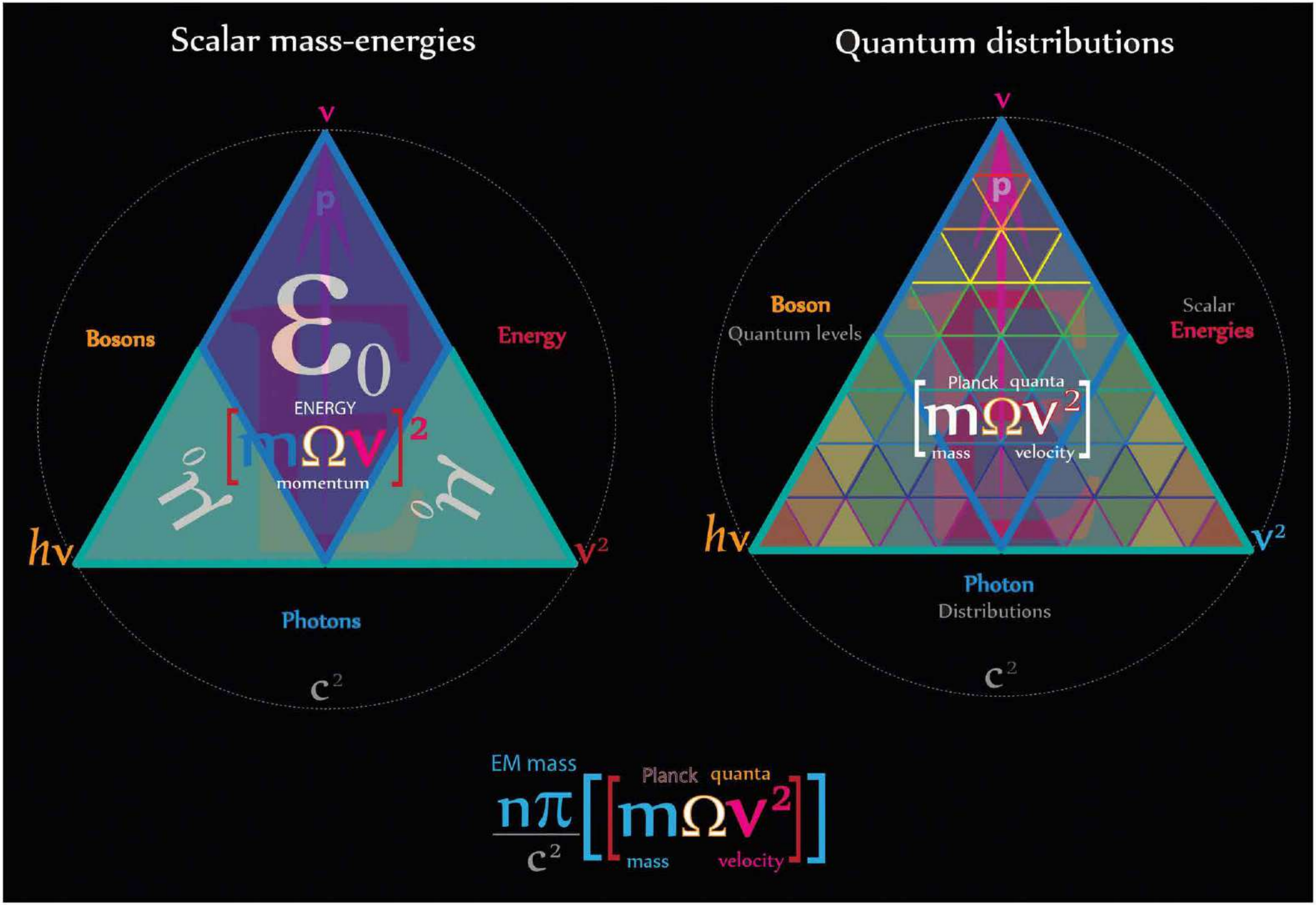

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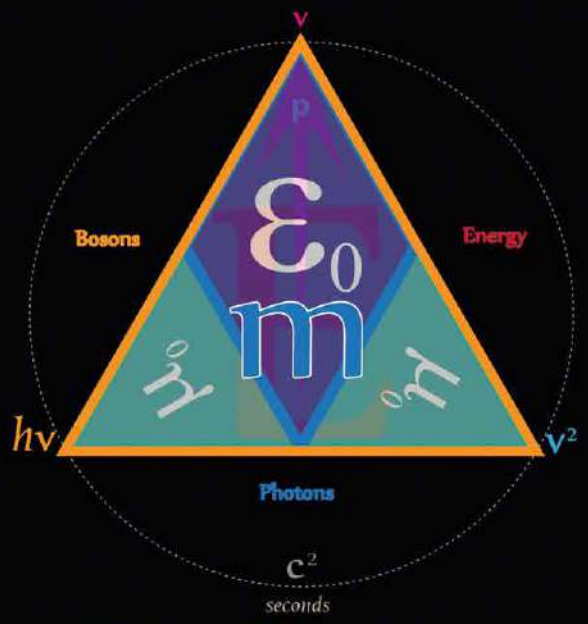
2D mass

EM mass

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta: mass, velocity



Measure of planar energies
in a nπ radiant wave
geometry
[per second]

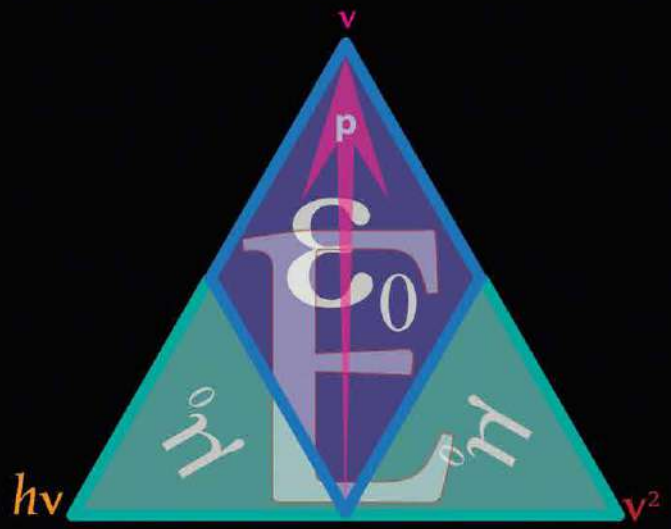
mass quantum
7.376238634 e-51 kg

ENERGY

$$n\pi\left[\left[m\Omega v^2\right]\right]$$

ENERGY: momenta

Equilateral energy momenta
has a mass equivalence
per unit of Time



c² is the radial geometry
created by radiant energy
in 1 second

Planck Constant
6.629432672 e-34 J.s

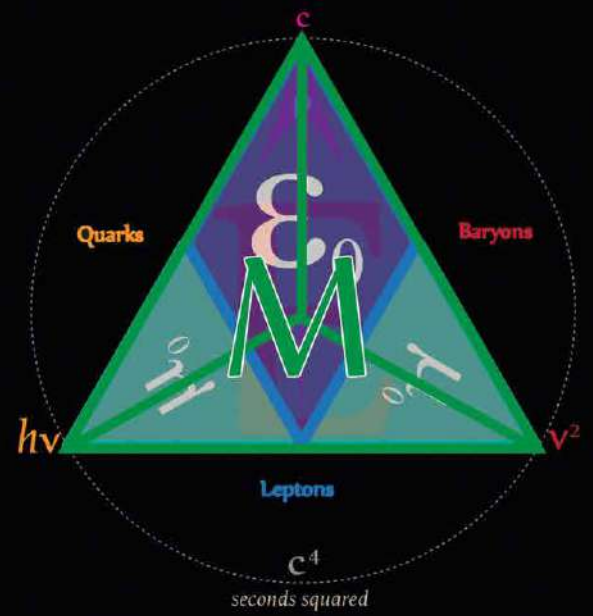
3D Matter

Matter

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta: mass, velocity

Measure of mass-energy
in a 4nπ standing wave
topology
[per second squared]



Matter quantum
2.9504955454 e-50 kg

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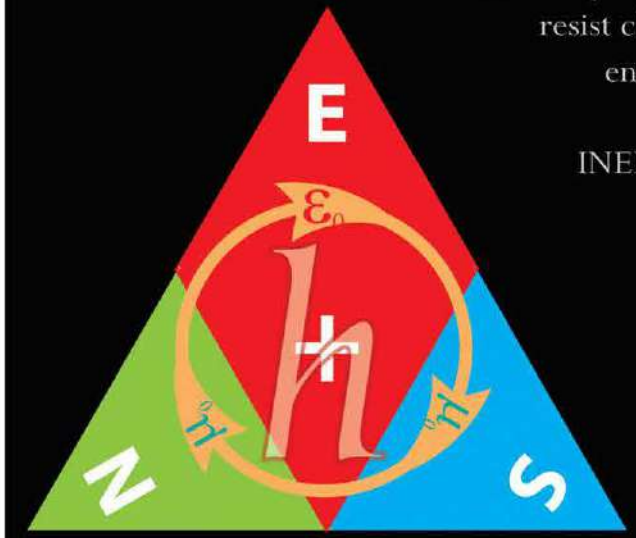
Planck's constant – the quantum of Action

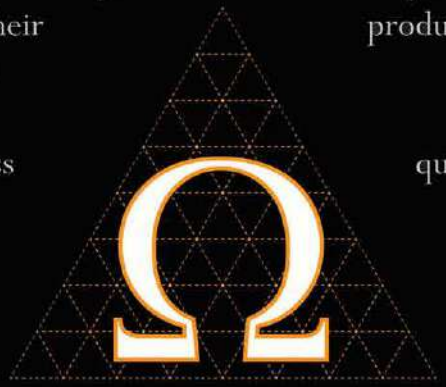
all ideal quantum inductive loops resist changes to their energy levels

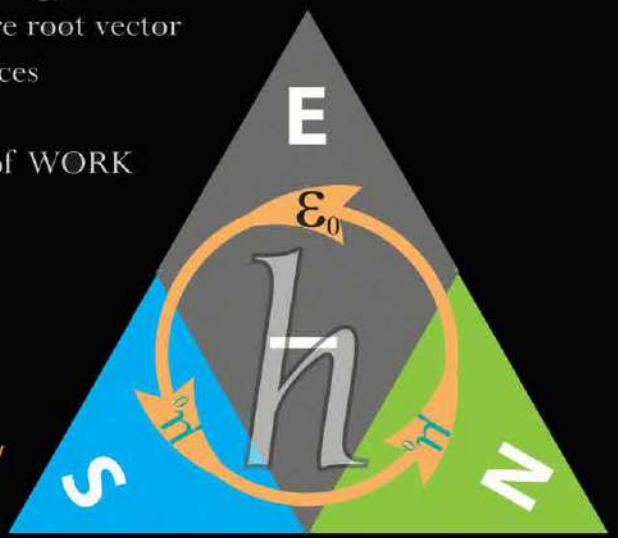
INERTIAL mass

all equilateral energy momenta produce square root vector Forces

quantum of WORK





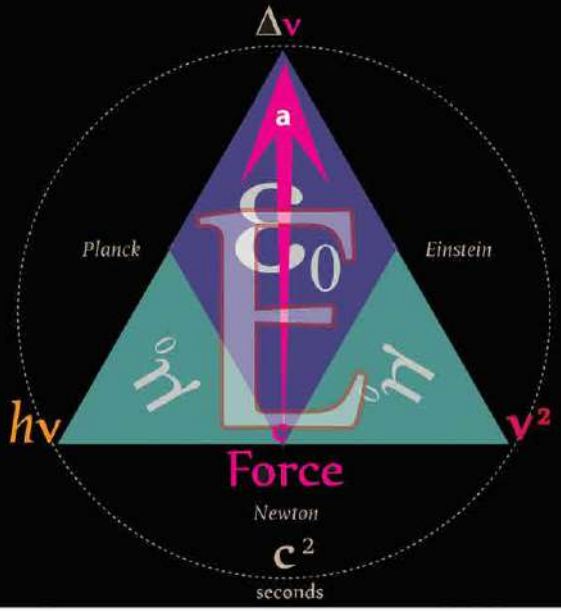


Quantised angular momentum is equilateral geometry

The two sides of Planck's Constant

The square root of all Energy is linear momentum

Equilateral energy quanta per second



Quantised angular momenta per second

mass

time

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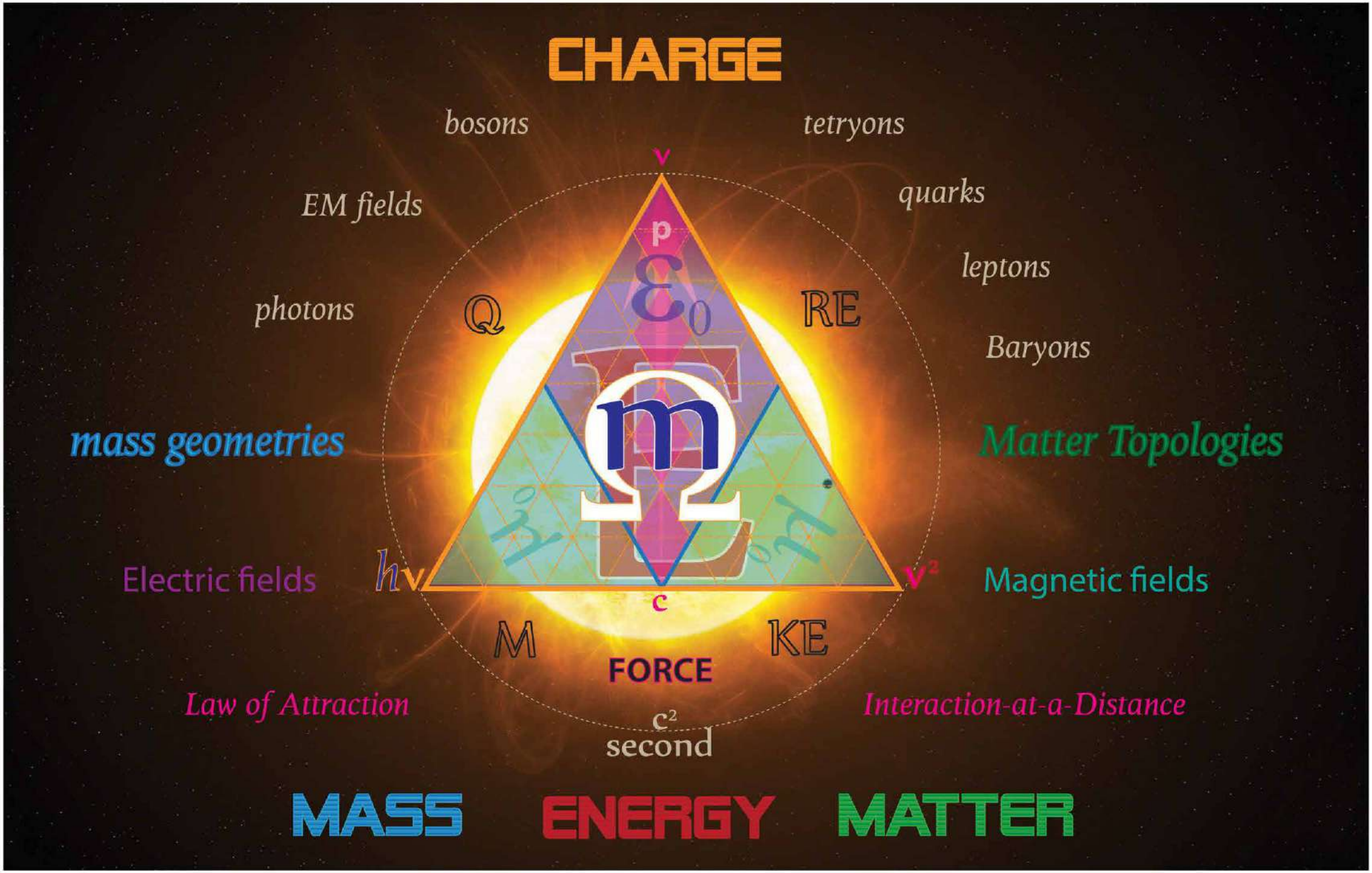

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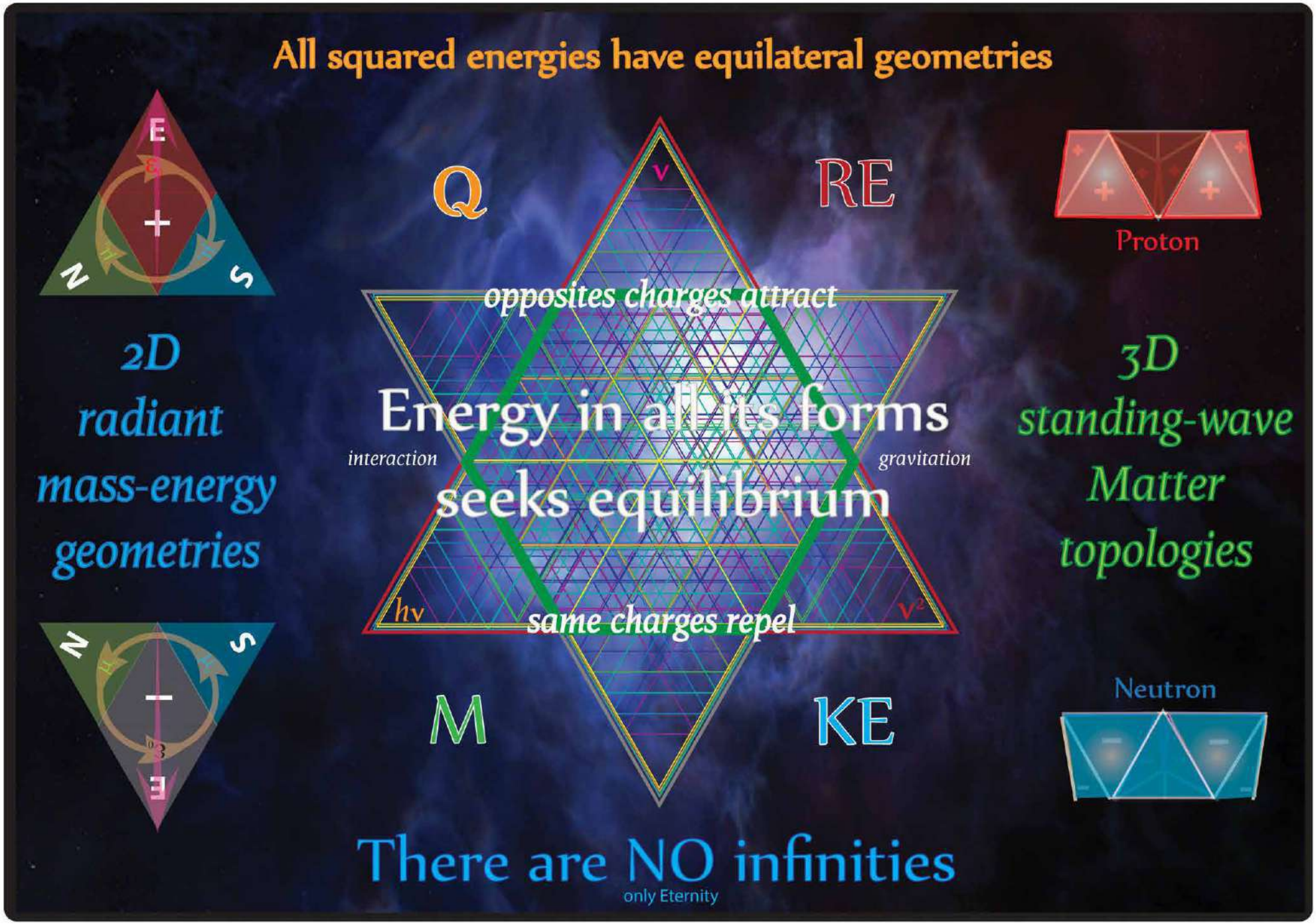

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Clean, limitless Energy

Unlimited resources

The geometric field equation of mass-ENERGY-Matter

$$T\pi \left[\left[\varepsilon_0 \mu_0 \right] . \left[m \Omega v^2 \right] \right]$$

Matter (topology) · spatial (impedance) · Planck quanta · mass · velocity

Unifying Science and Religion

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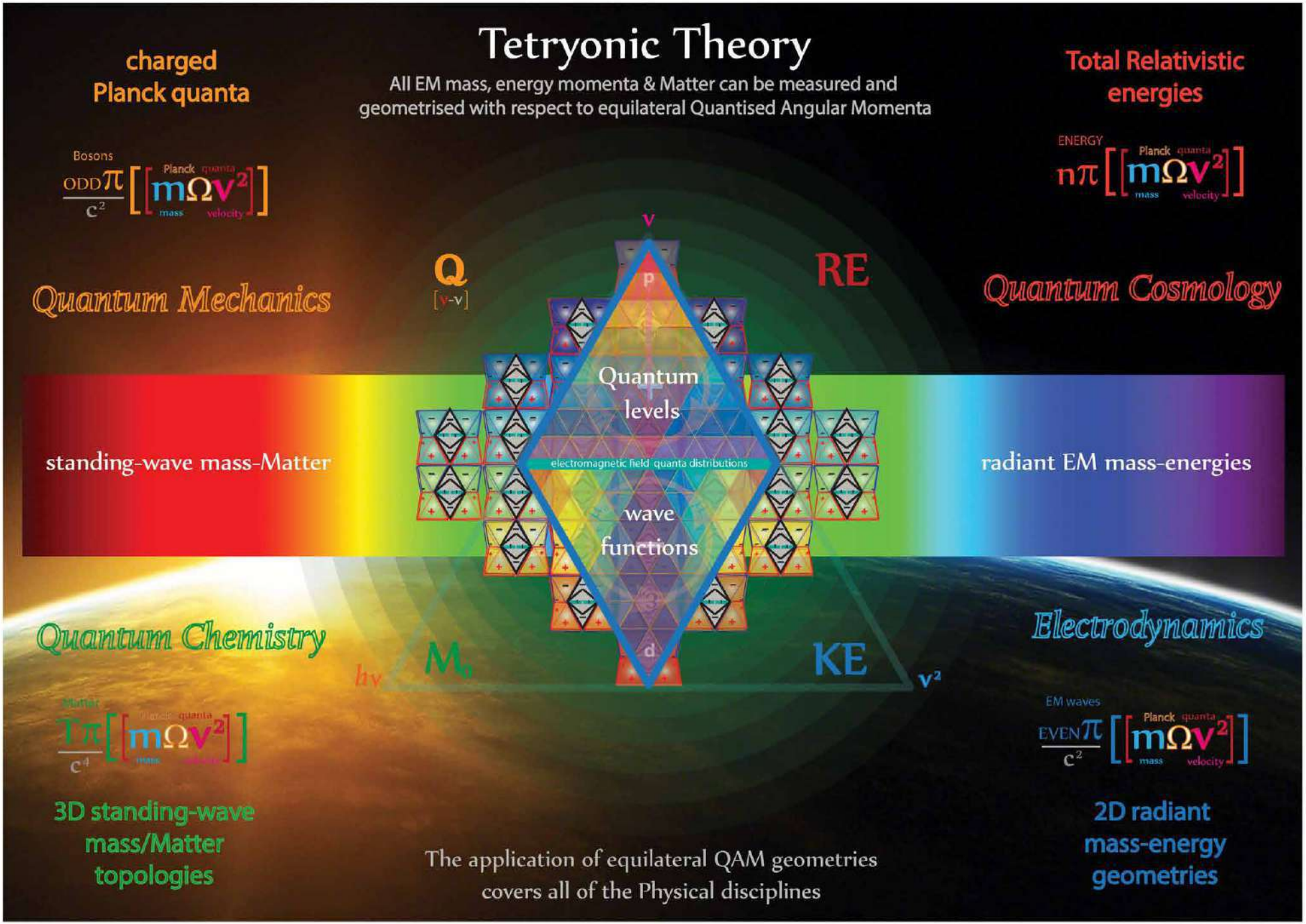

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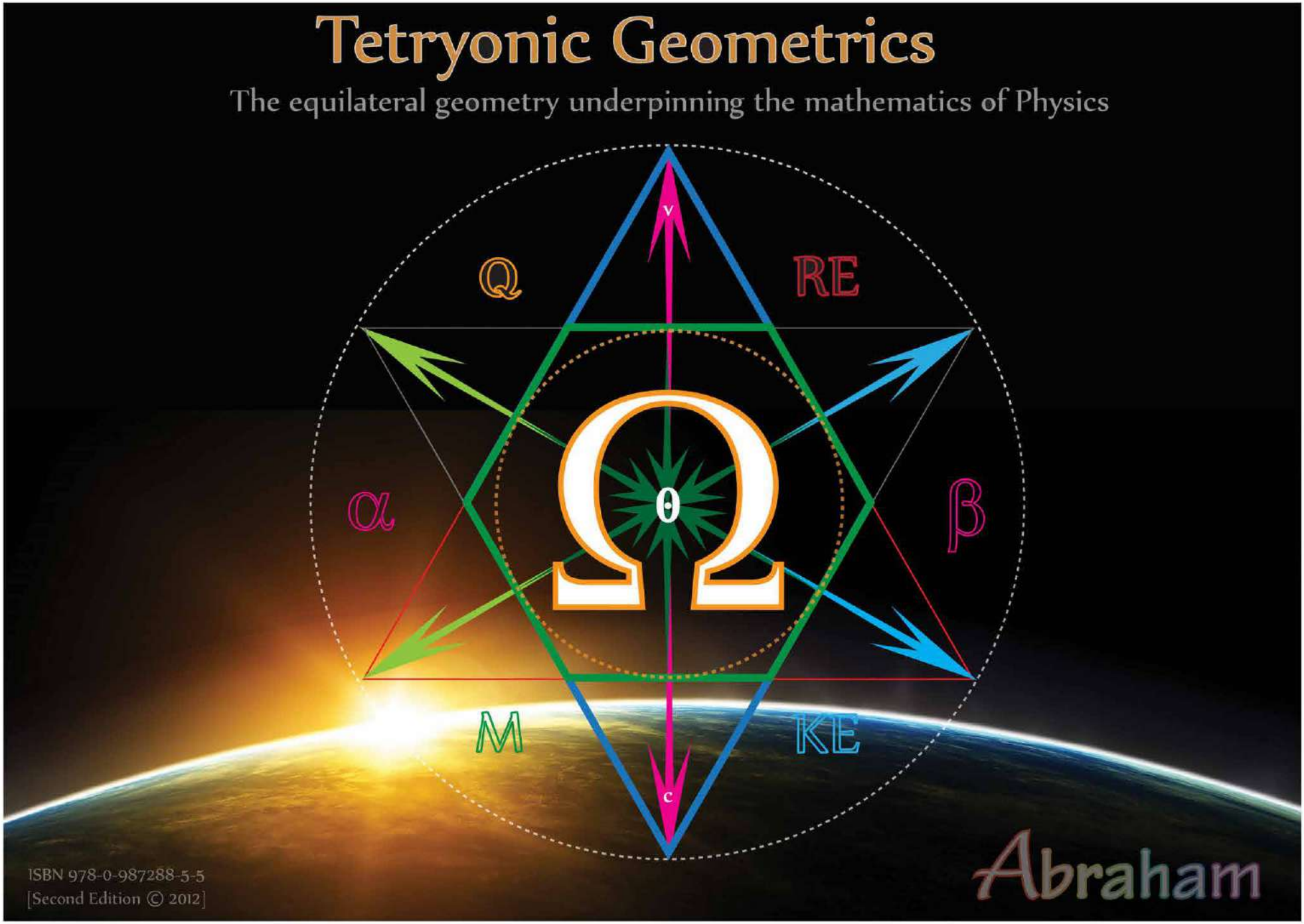

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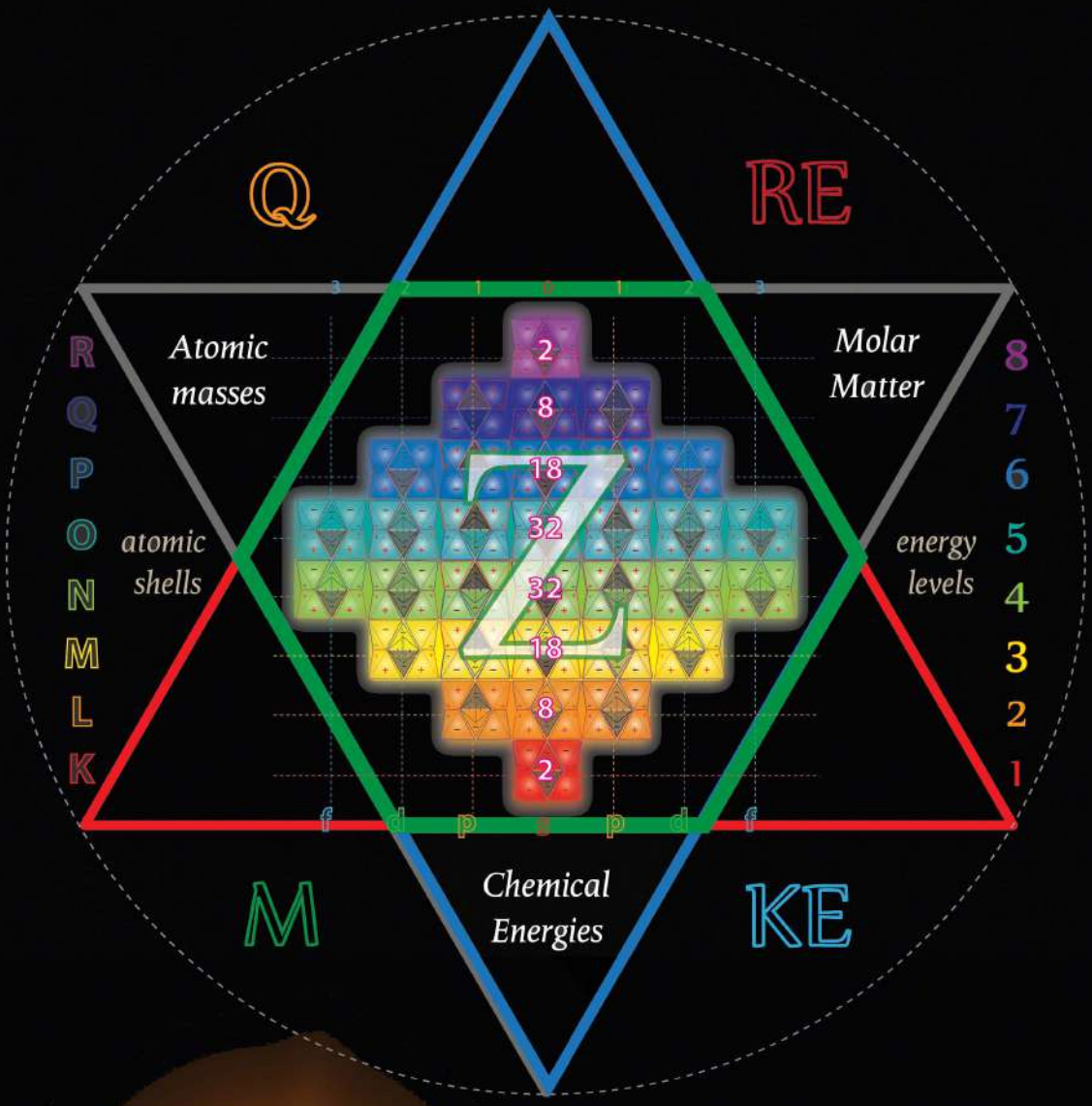
TETRYONICS

The charged topology of periodic & compound Matter



Foundational Quantum Chemistry

Abraham

ISBN 978-0-987288-3-1

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Residual Electro-Magnetic Forces

allow Neutrons and Protons to attract via the opposite Electric charge points created by their constituent Quarks in order to create Elementary Nuclei

Protons + Neutrons

u+d+u d+u+d

All electrons, quarks and Baryons are made up of 4n+ (Tetryonic) standing-wave EM fields.

As well as having nett Tetryonic charged topologies ranging between [+24] ~ [-12] they all posses distinct ELECTRIC FIELDS that are concentrated in 3 apex points as indicated in the illustrations

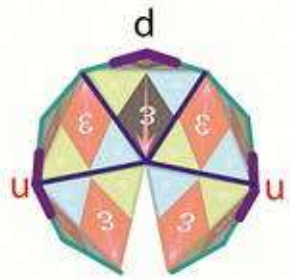
These points result from the orientation of Electric apexes and orthagonal Magnetic dipole field edges that make up each particle's externalised EM fields.

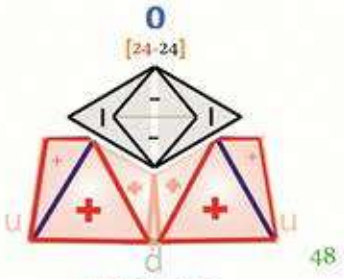
The Positive and Negative electric apex points, obey the Law of Interaction forcing separated nuceli to combine due to their individual nett Tetryonic charges and provide a means of orienting nuclei to each other to create larger particles [elements, allotropes and compounds]

External Magnetic (H) fields can interact with the integral magnetic (B) dipoles of Tetryonic particles forcing them to orientate in specific directions to facilite chemical bonding [nuclear forces]

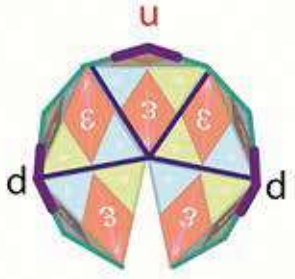
Additionally, external Electric fields can intercct with the integral electric fields attracting or repelling them depending on the polarity of the external electric field [Electrostatics]

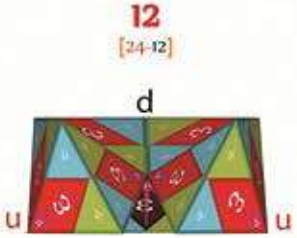
External energies can be induced into these integral EM fields via inductive coupling or the absorption of spectral photons in turn leading to an increase in the strengthes of the integral EM apexes in turn increasing the Strong Nuclear Force.

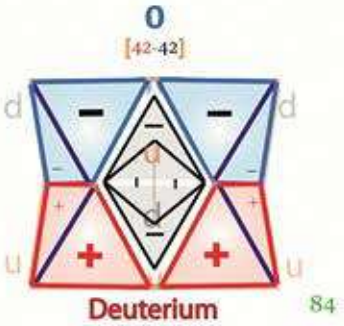




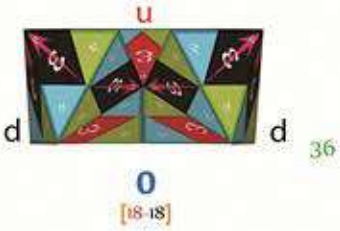
Hydrogen



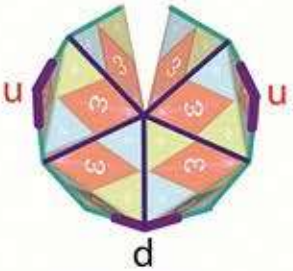




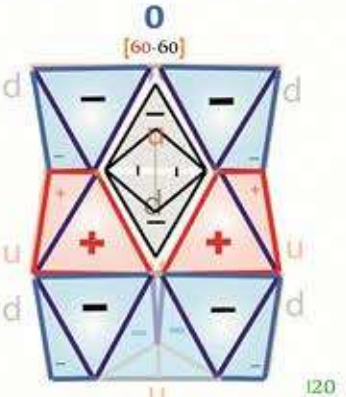
Deuterium



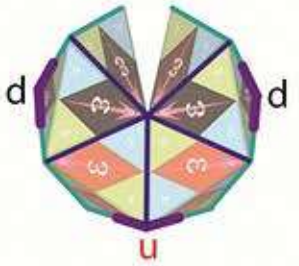
The Strong Nuclear force binds Matter together



The orientation of the component Electric fields within 3D Matter creates macroscopic force apexes via externalised 'E-points'



Tritium



The orientation of the component Magnetic fields within 3D Matter creates macroscopic force apexes via externalised 'M-dipoles'

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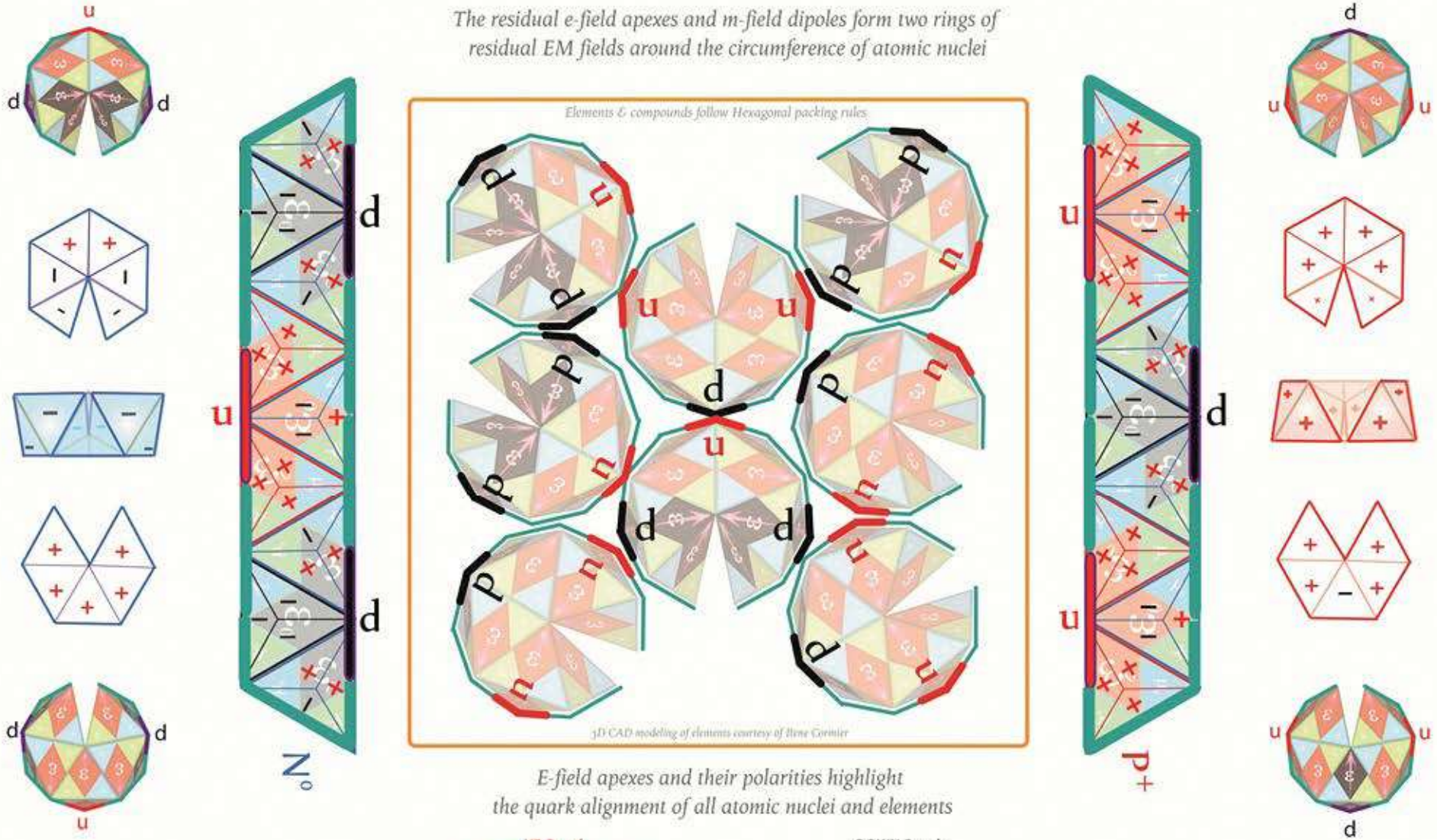
Nucleonic residual EM force

Neutrons

Protons

The attraction between Baryonic E&M field apexs, a result of their component Quark arrangements, results in the formation of heavier and more complex Nuclei

The residual e-field apexes and m-field dipoles form two rings of residual EM fields around the circumference of atomic nuclei



E-field apexes and their polarities highlight the quark alignment of all atomic nuclei and elements

UP Quark
Positive Electric field apex

DOWN Quark
Negative Electric field apex

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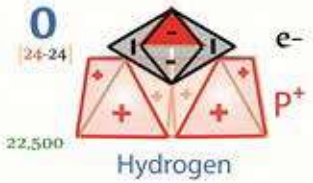
Insulators and Conductors

The position of electrons in Nuclei within Atomic Elements
results in the properties of Insulators or Conductors

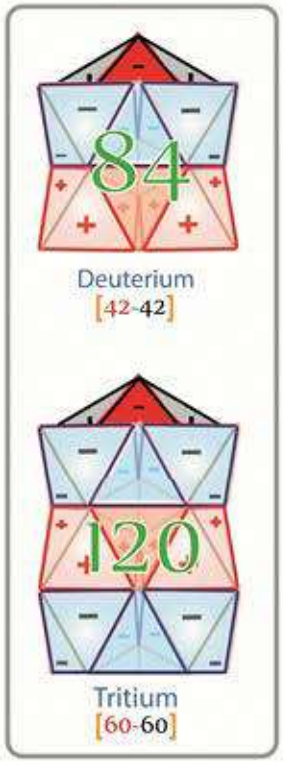


Coloumbic forces

Electrons are attracted to the residual EM net (+12) positive charge of Protons or n[+12] unbalanced Ionic charges of nuclei

Conductor

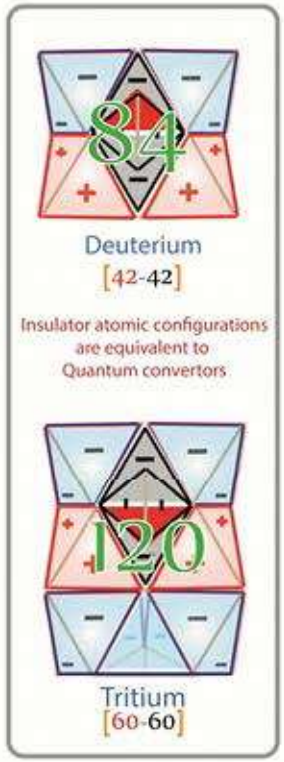
Electrical energies move around the material via boson exchanges and electron movement



≈

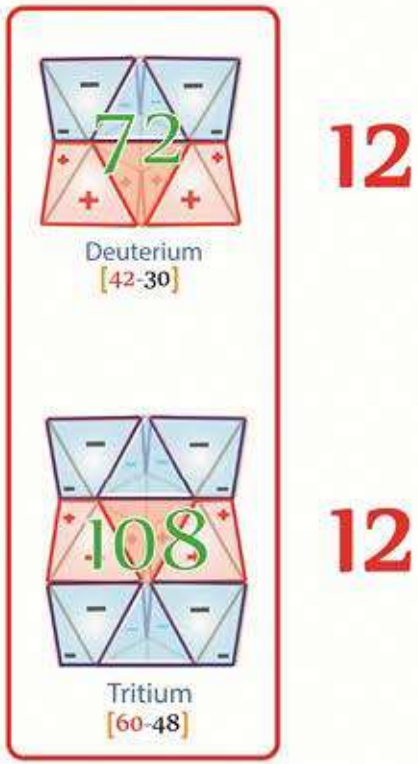
Insulator

Electrical energy is fixed within the nucleus as electrostatic charges & released upon demand via electron rotation/motion within the nucleus



Ions

Charge (energy) is moved around material via electron movement



Conductive materials contain 'free' electrons that can be readily or easily moved within the material

Insulator materials have electrons that are 'bound' tightly to the atoms and store charges locally where they are applied

Materials that have been ionised are more likely to become Conductors as they easily attract and bind free electrons to them

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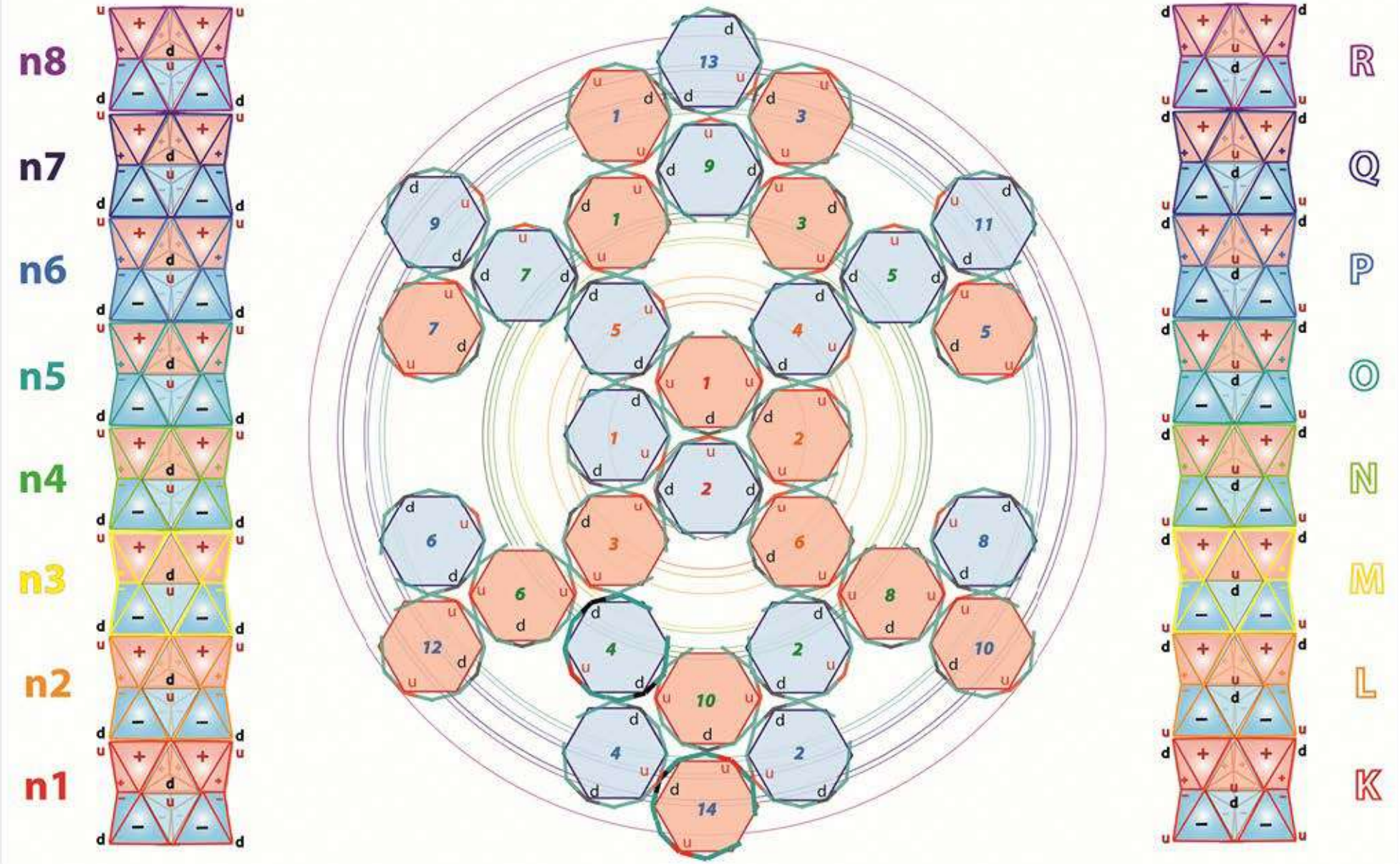
Nucleon Quark Arrangement

The nuclei arrangement of each atomic shell [quantum level] is the result of quark EM field interactions



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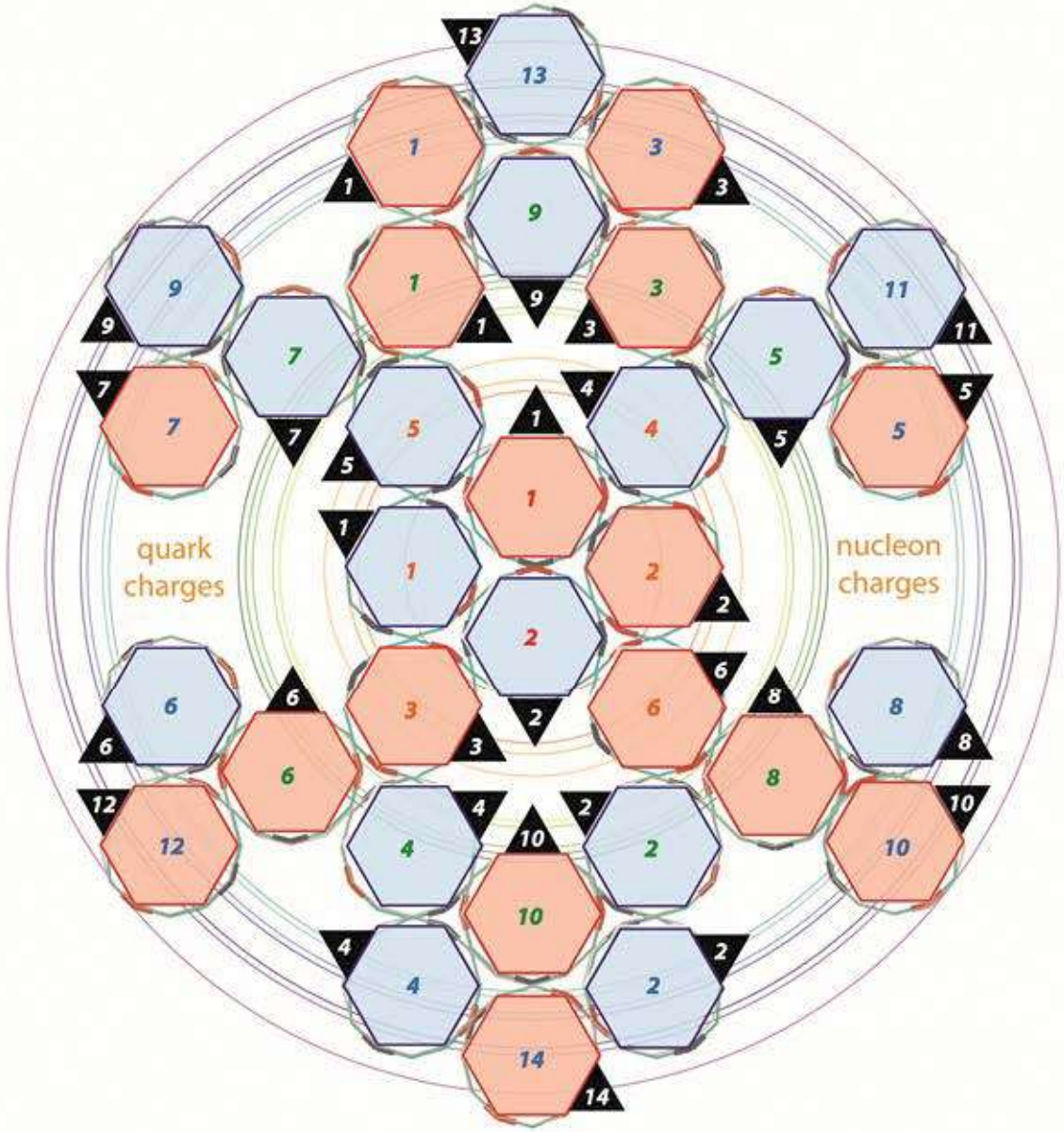
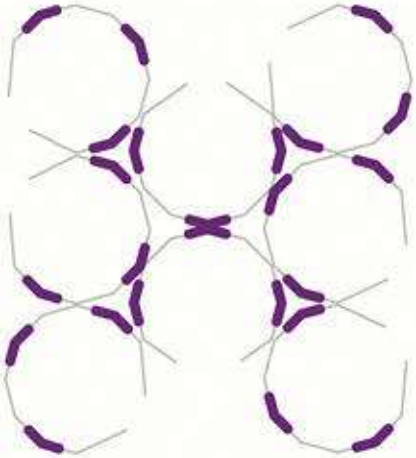
Nucleon Charges and Bonding



(Strong force - topological Electric Points)



residual EM forces

(Strong force - topological Magnetic dipoles)

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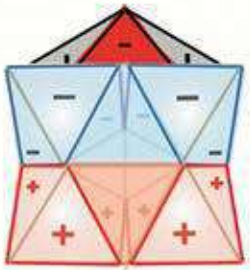
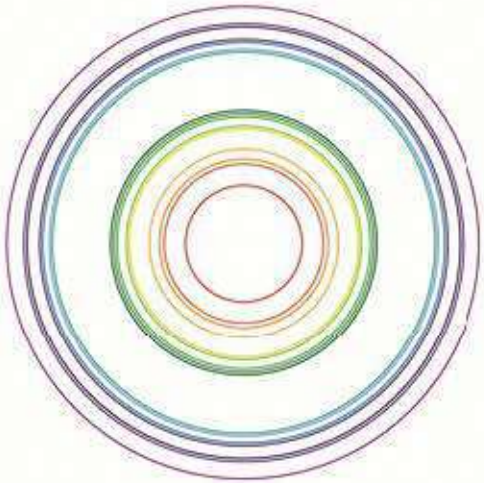
Bound electron arrangements

Externally bound electrons produce sub-orbital patterns
different to the electron orbitals of internally bound electrons



Deuterium

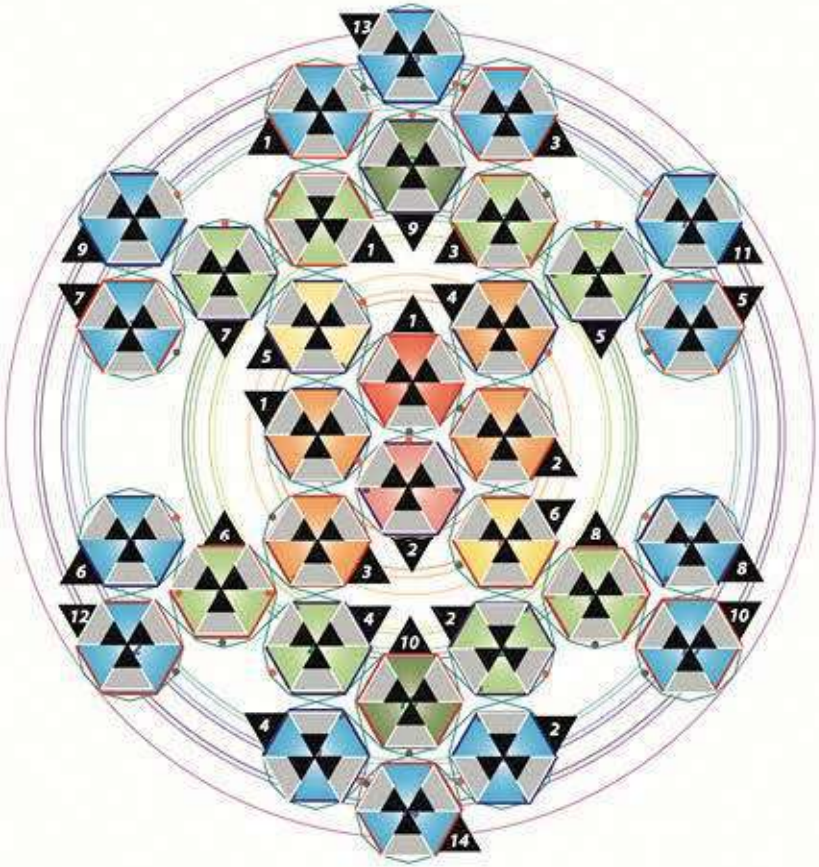
electrons are externally bound to the Deuteron nuclei



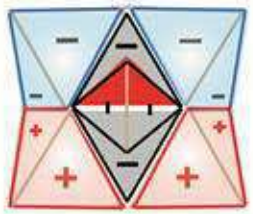
Conductors

Charges are free to move and equalise

electrons require less energy
to 'break free' from Nuclei

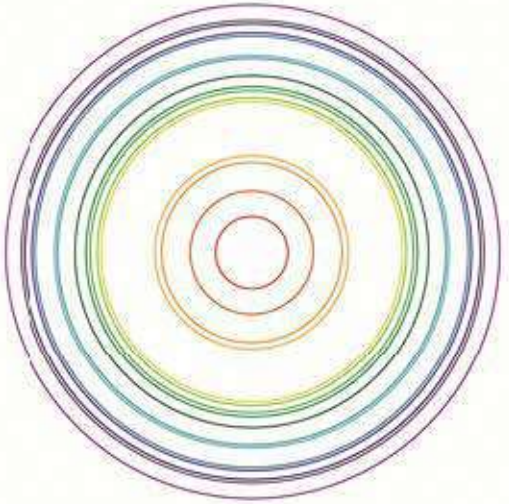


The electron orbitals of
conductors are lower energies
than those of insulators



Deuterium

electrons are internally bound in the Deuteron nuclei



Insulators

Charges are bound to specific locations

electrons require more energy
to 'break free' from Nuclei

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2D mass-energy geometries form the fabric of 3D Matter topologies

Proton

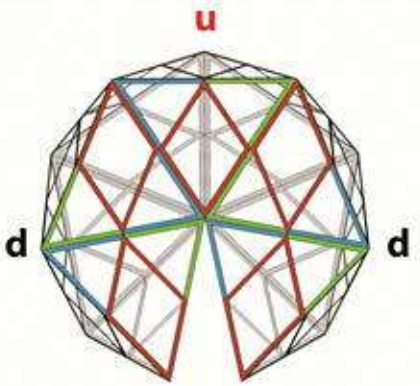
12
[24-12]

nett Charge
component charges

charged mass-energy geometry

20π

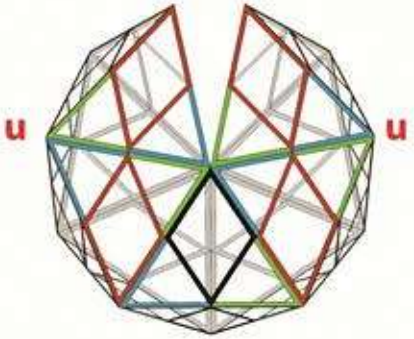
Matter topology



12
[42-30]

40π

Deuteron



nett Charge
component charges

0
[18-18]

charged mass-energy geometry

Matter topology

20π

Neutron

Charge provides the framework for the mass-energy geometry of Matter

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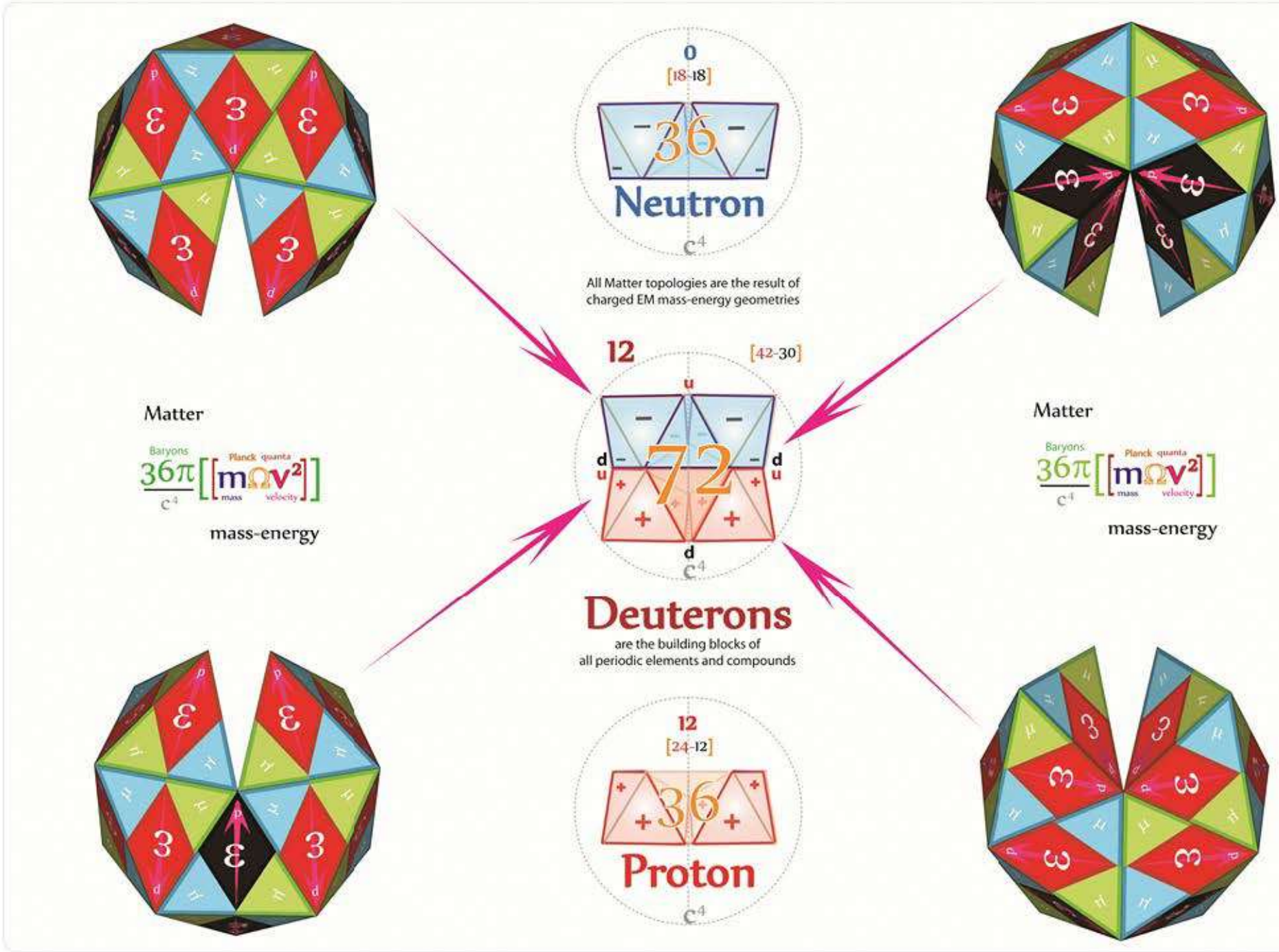

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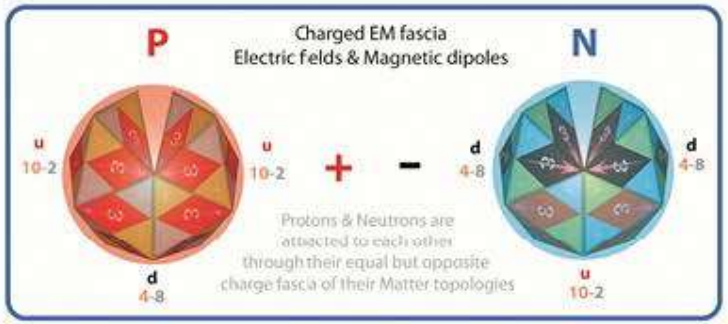
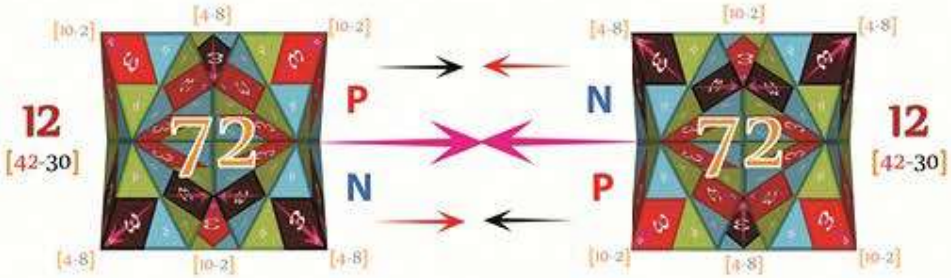
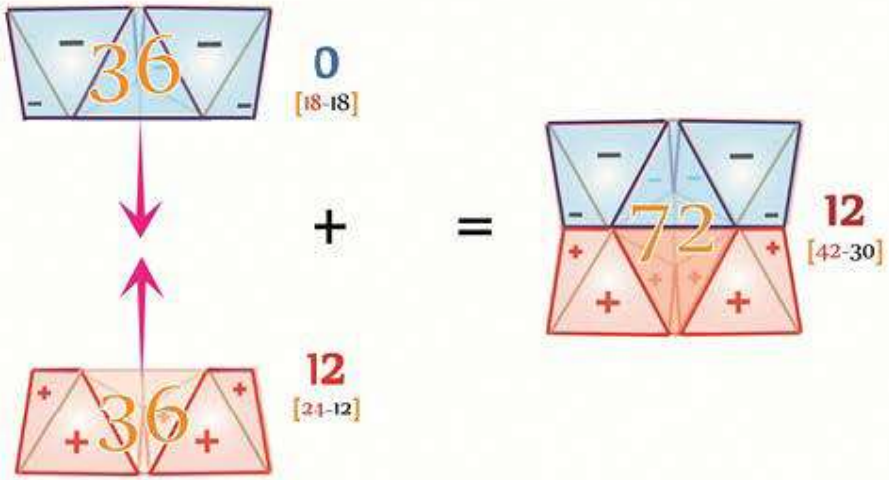
Strong Forces and Nuclear Bonding

How do Baryons with Positive and Neutral charges attract each other and bind to form stable elements ?



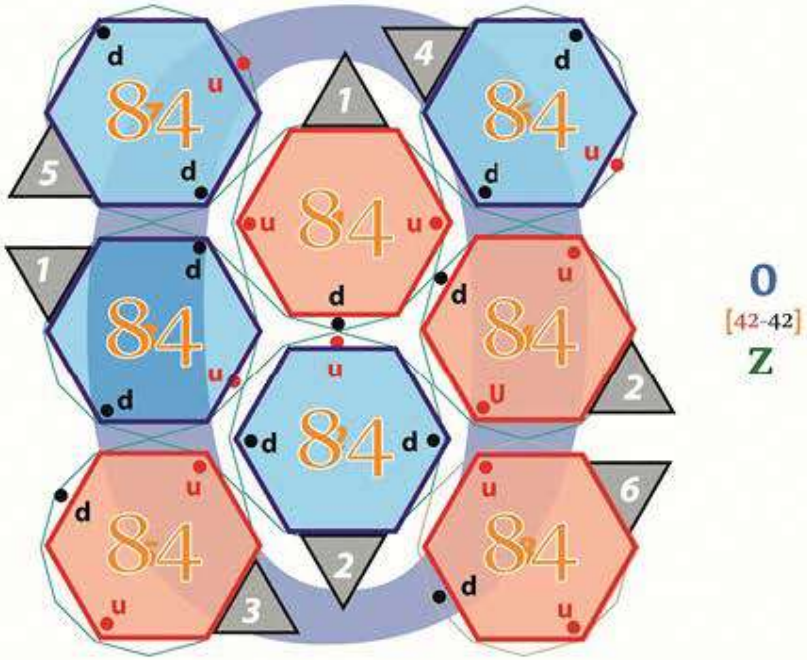


Once nuclei have been created their external electric fields & magnetic dipoles continue to attract and bind individual nuclei together via the Residual EM Force as nuclei seek charge equilibrium by combining with each other and electrons to form neutral elements



The attraction and binding of Protons and Neutrons through their electric charge imbalances creates Deuterons which have +12 charges

The residual Z[+12] charge is what attracts electrons to form neutral atomic nuclei via Coulombic attraction



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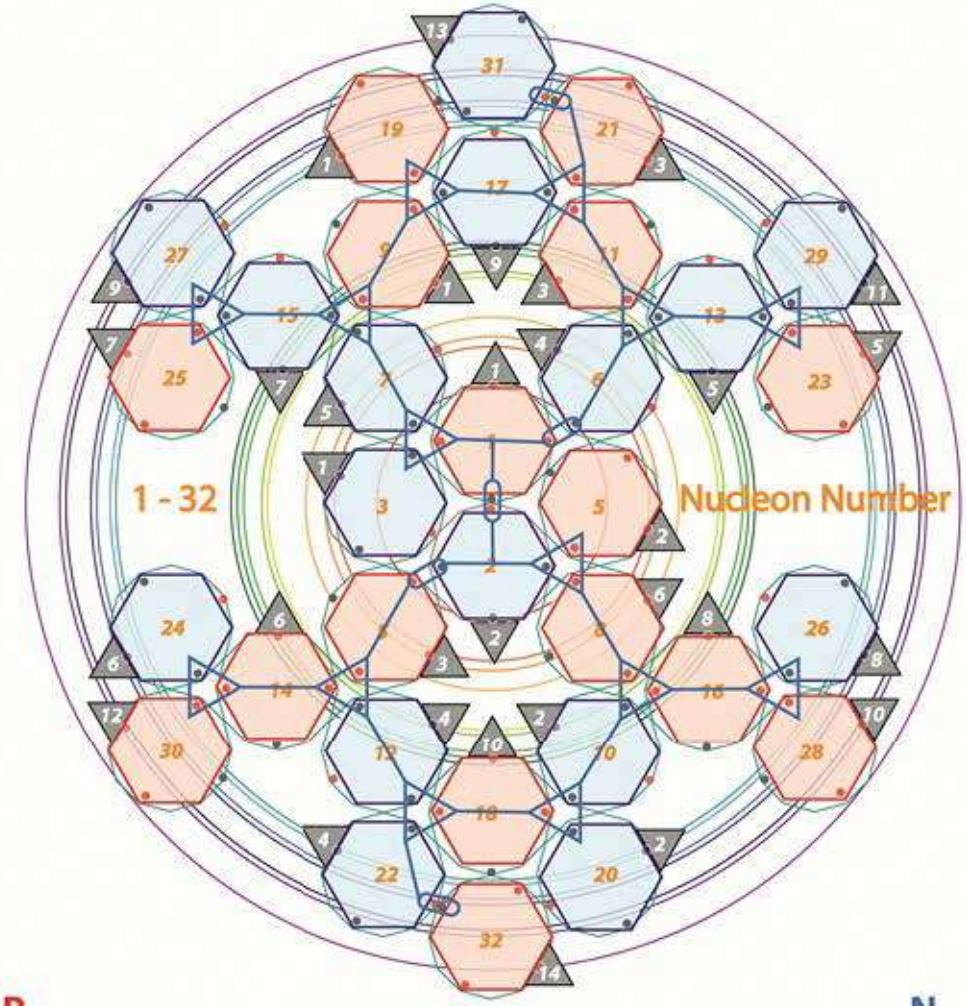
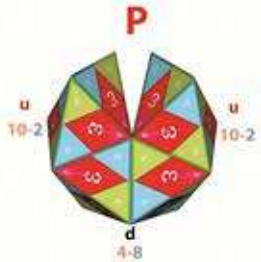
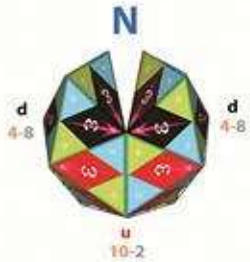
Strong Nucleonic Bonding



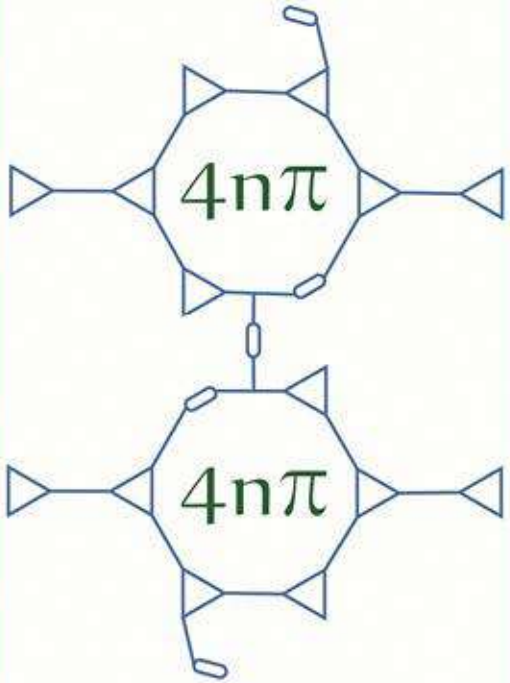


\+ In addition to the Strong colour force a separate residual binding force arises from the external apexes formed by Positive and Negative Electric points of quarks in each Baryon [nuclear-chemical bonds] −



All energy seeks equilibrium

External Electric field points bind via Charge fascia interactions with Plus and Minus Electric points combining and sharing energy throughout the resultant nuclei



Positive Electric field apex

Negative Electric field apex

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Hydrogenic vs Nucleonic electron binding

If a unbound Proton attracts an Electron
the Electron can be bound to the nuclei
in a number of differing orienations
[each with differing spin energies]

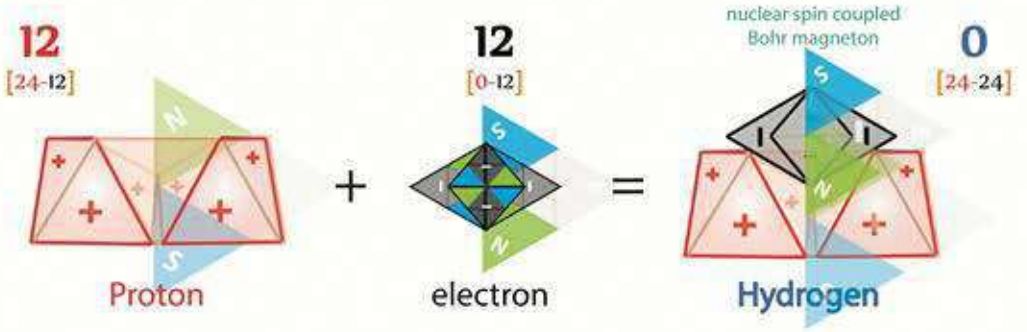
All atomic nuclei (and elements) are Deuteron'ic nuclei with a mixture of *orthagonal*, parallel and anti-paralllel spin orientations

(this is why Rydberg is less accurate for elemental nuclei compared to Hydrogenic atoms - see QM spin)

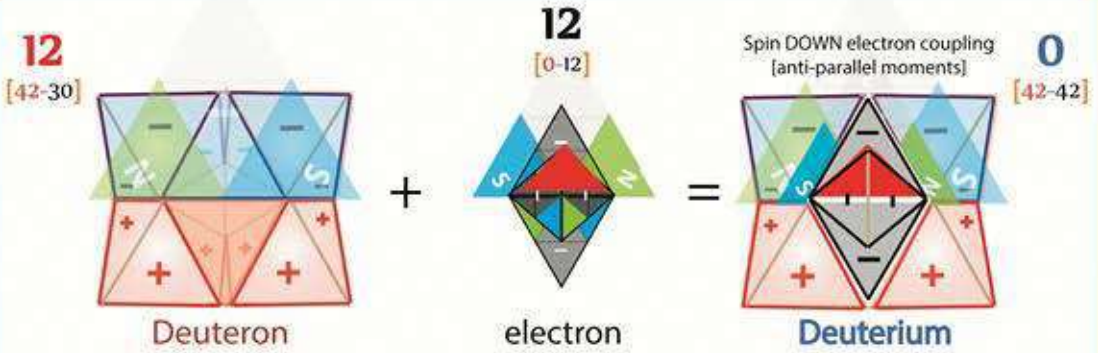
Electrons can be bound to deuteron nuclei
in four distinct orientations [2 horizontal & 2 vertical]
with each spin coupling orientation producing
differing energy electron orbitals
[wrt to the nuclear magnetic moments]

Ejecting electrons from atomic nuclei
by adding energies to their KEM fields
[the Photoelectric effect]
creates Positive Ions

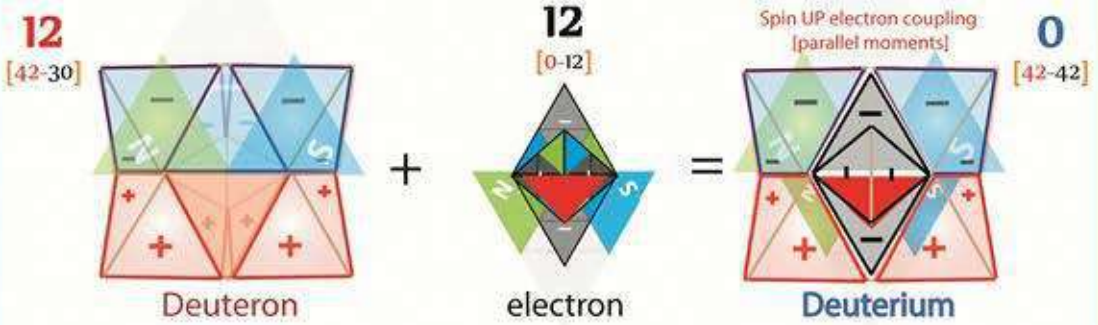
Vertically orientated electrons
within Proton-Neutron Nuclei [Deuterons]
create quantum synchronous conversor geometries



The energy levels of Baryons determines the KEM field energy of bound electrons



Bohr magnetons are always referenced wrt the Nuclear magneton



electrons produce stronger magnetic moments due to their mass-charge quotient

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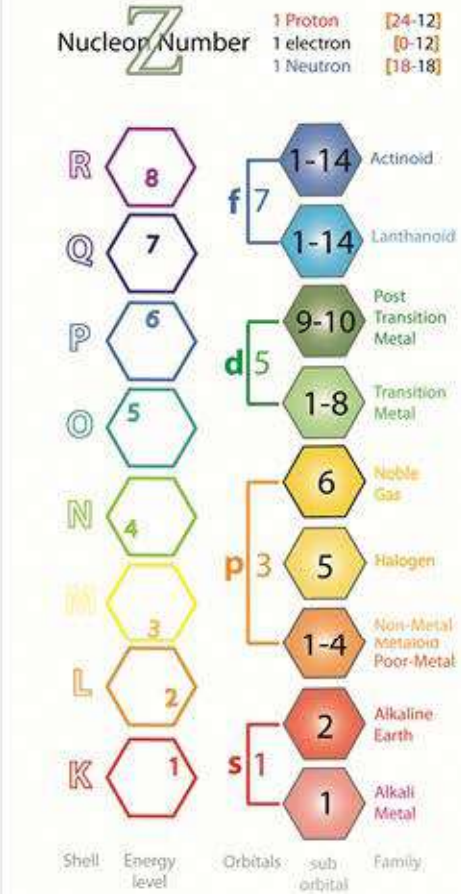
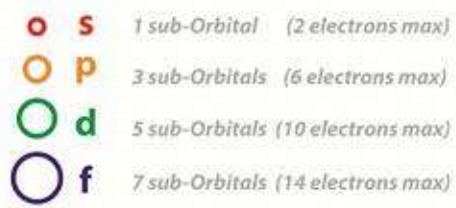
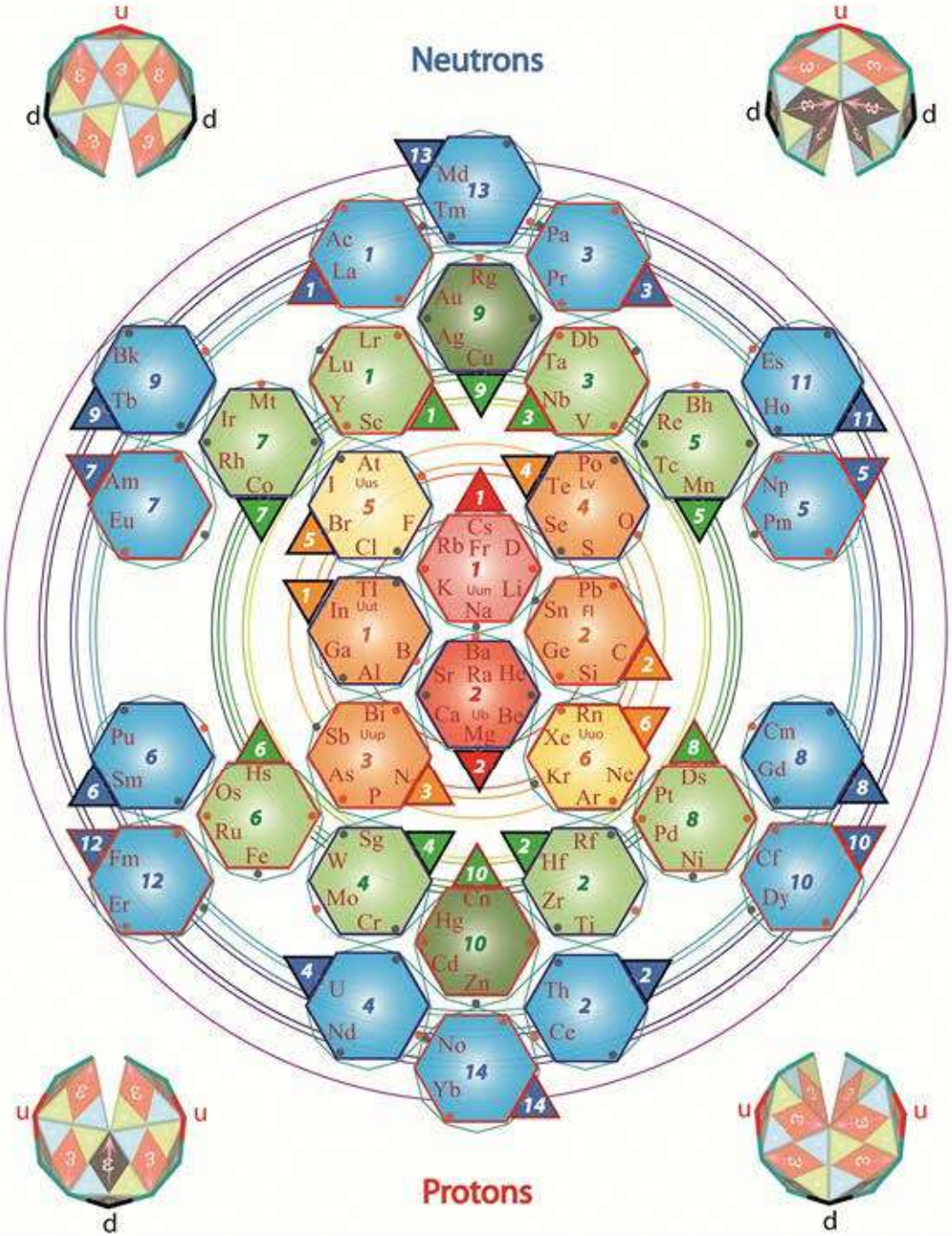
Atomic Nucleus Master Template




o s 1 sub-Orbital (2 electrons max)
p 3 sub-Orbitals (6 electrons max)
d 5 sub-Orbitals (10 electrons max)
f 7 sub-Orbitals (14 electrons max)



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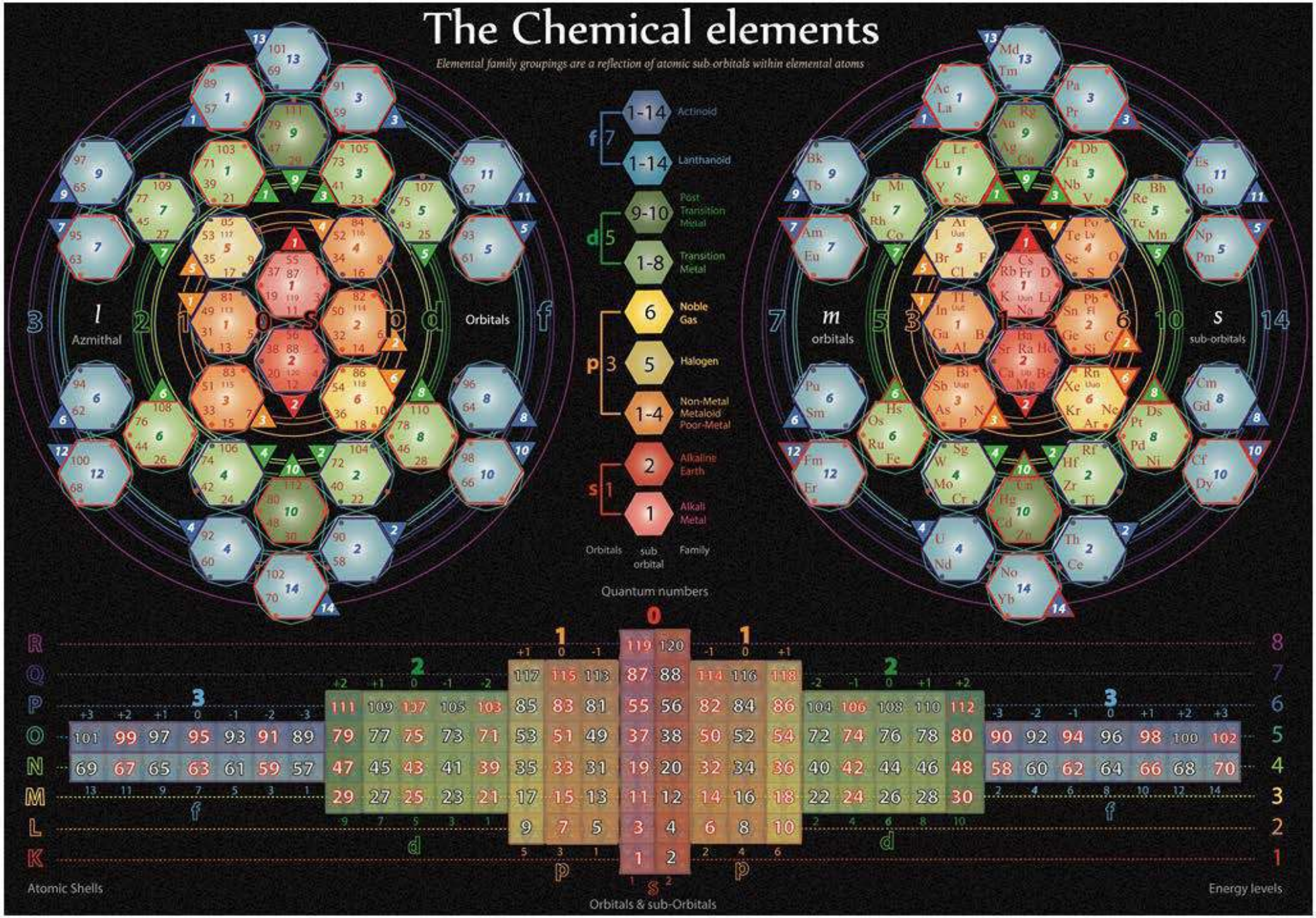

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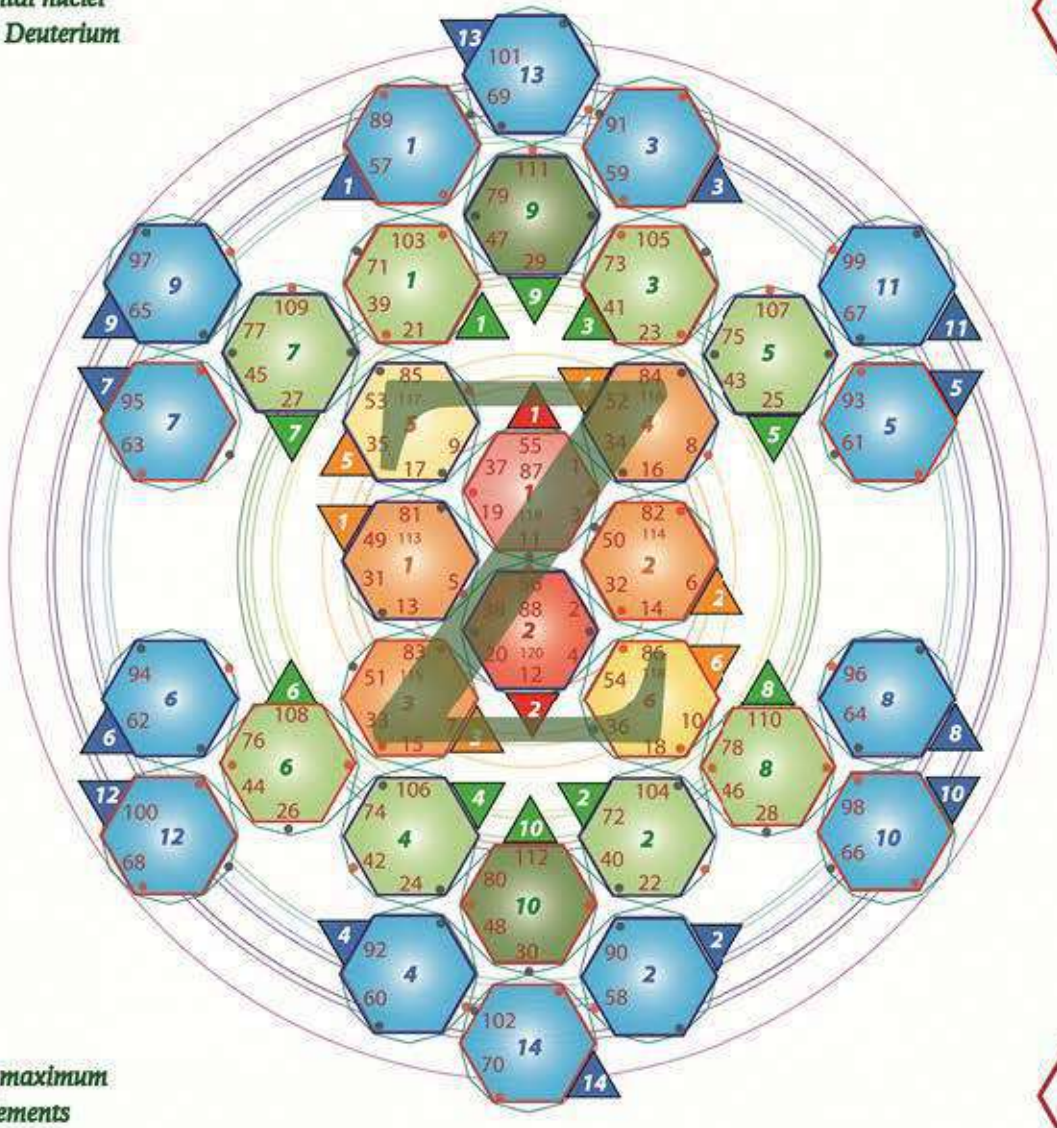
Element Numbers

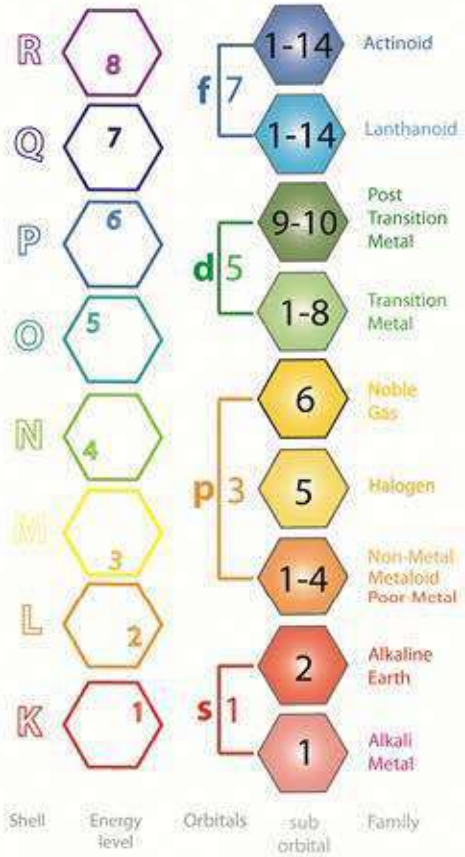
Z * 1 Proton [24-12]
1 Neutron [18-18]
1 electron [0-12]

Each elemental nuclei is made from Deuterium



Atomic shells: P Q R M O N K L

Energy levels: 1 2 3 4 5 6 7 8



o s 1 sub-Orbital (2 electrons max)
o p 3 sub-Orbitals (6 electrons max)
o d 5 sub-Orbitals (10 electrons max)
o f 7 sub-Orbitals (14 electrons max)

There are a maximum of 120 elements possible

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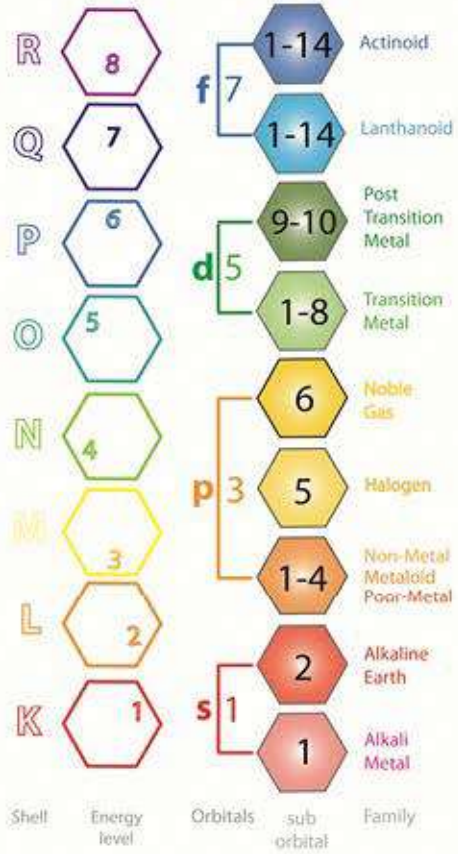
Element Names

Z * 1 Proton [24-12]
1 Neutron [18-18]
1 electron [0-12]



o s 1 sub-Orbital (2 electrons max)
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d 5 sub-Orbitals (10 electrons max)
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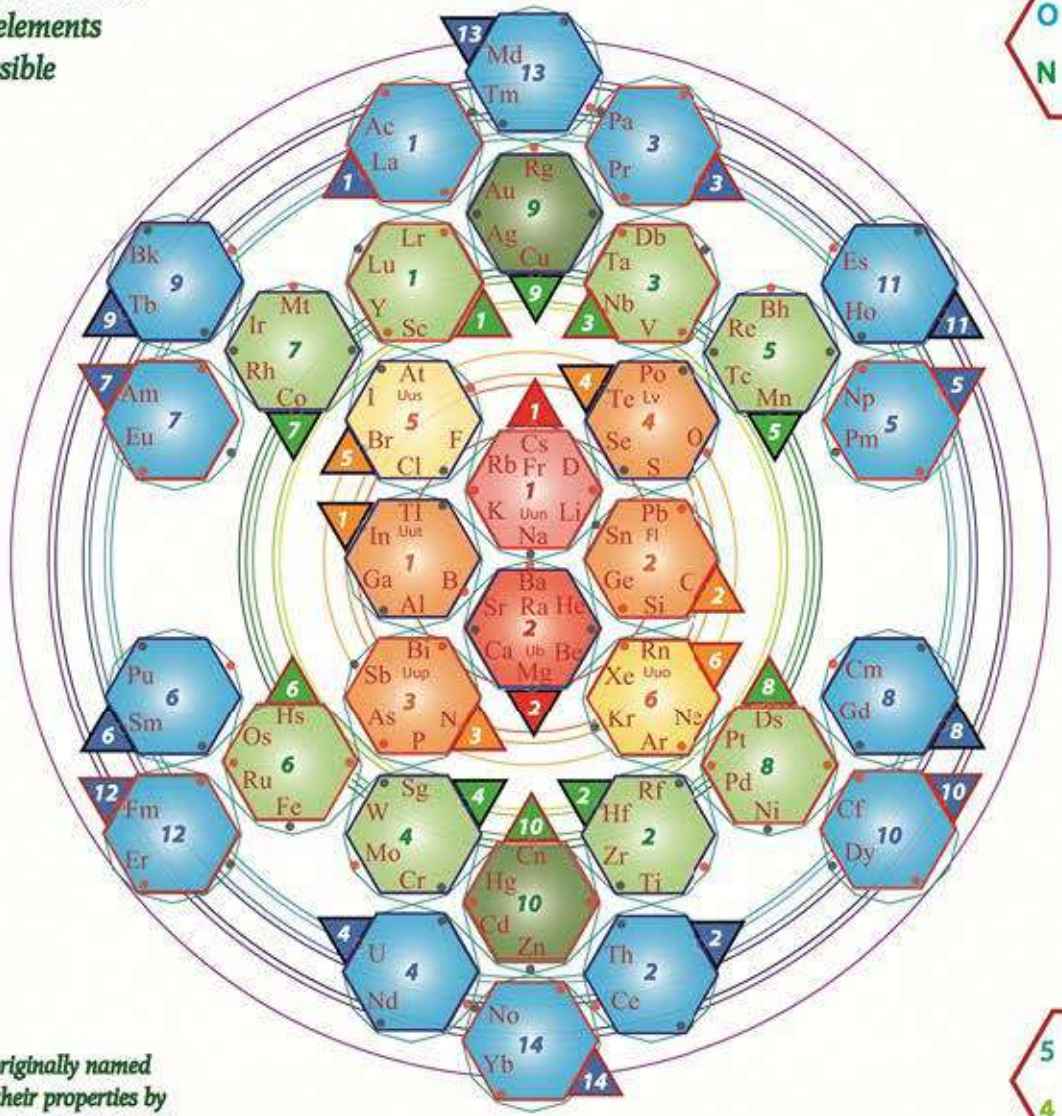
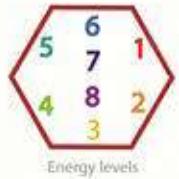
There are a maximum of 120 elements possible



They were originally named according to their properties by their discoverer but have recently been named after famous scientists



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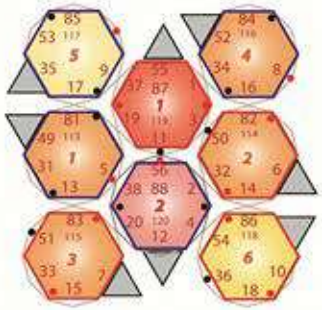
Electron orbital configurations

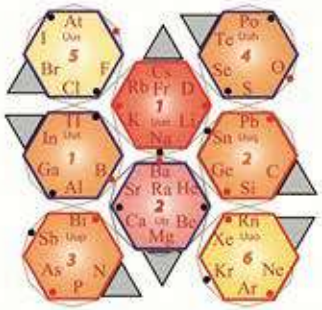
A huge number of differing d and f orbital configurations are possible given the number of nuclei and bond points created by elemental topologies

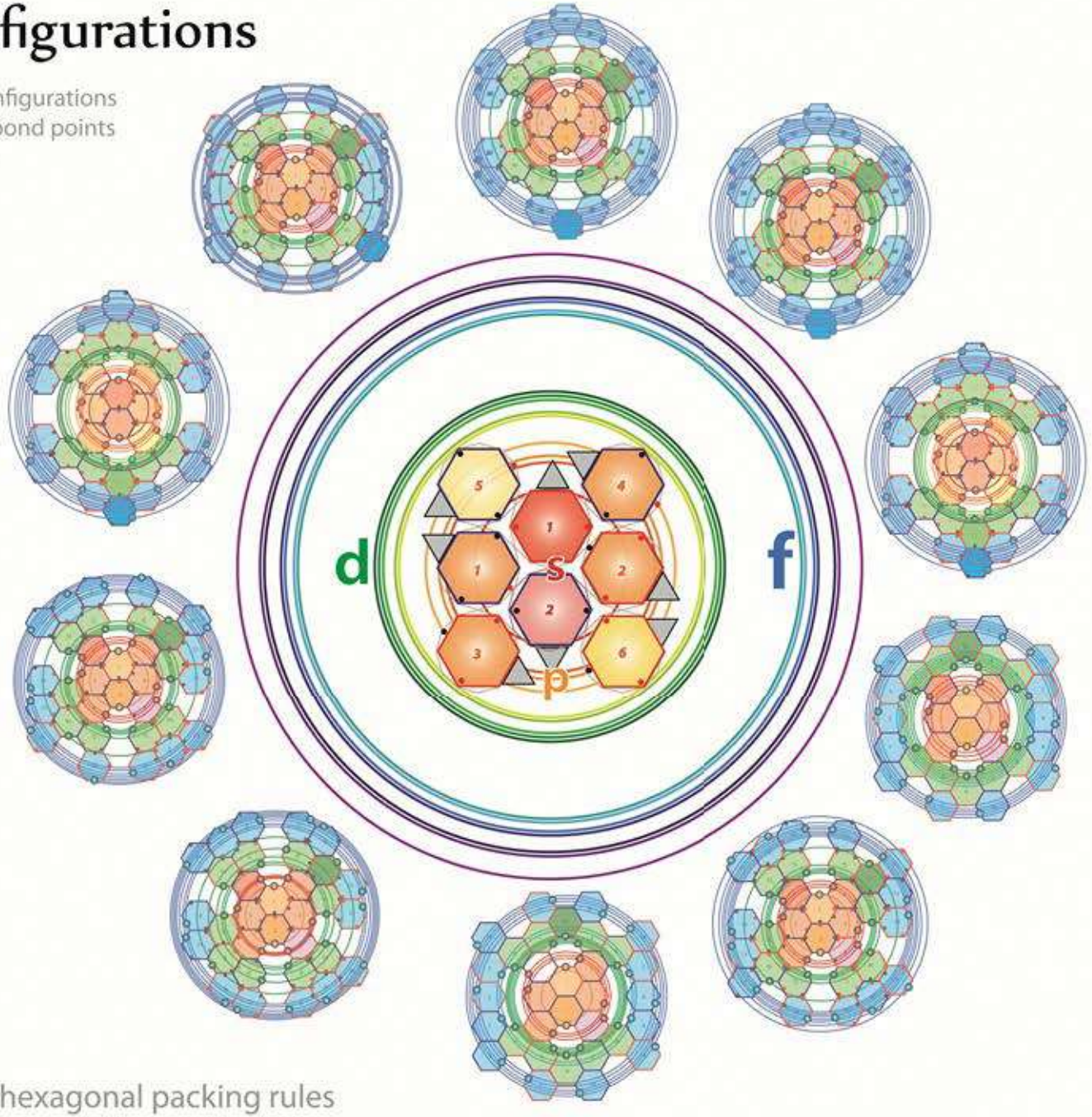


As the number of nucleons increases so does the complexity of the electron orbitals possible

quantum snowflakes

However all have a stable 'core' grouping of nuclei comprised of s and p electron orbitals





All nuclei bonding closely follows hexagonal packing rules

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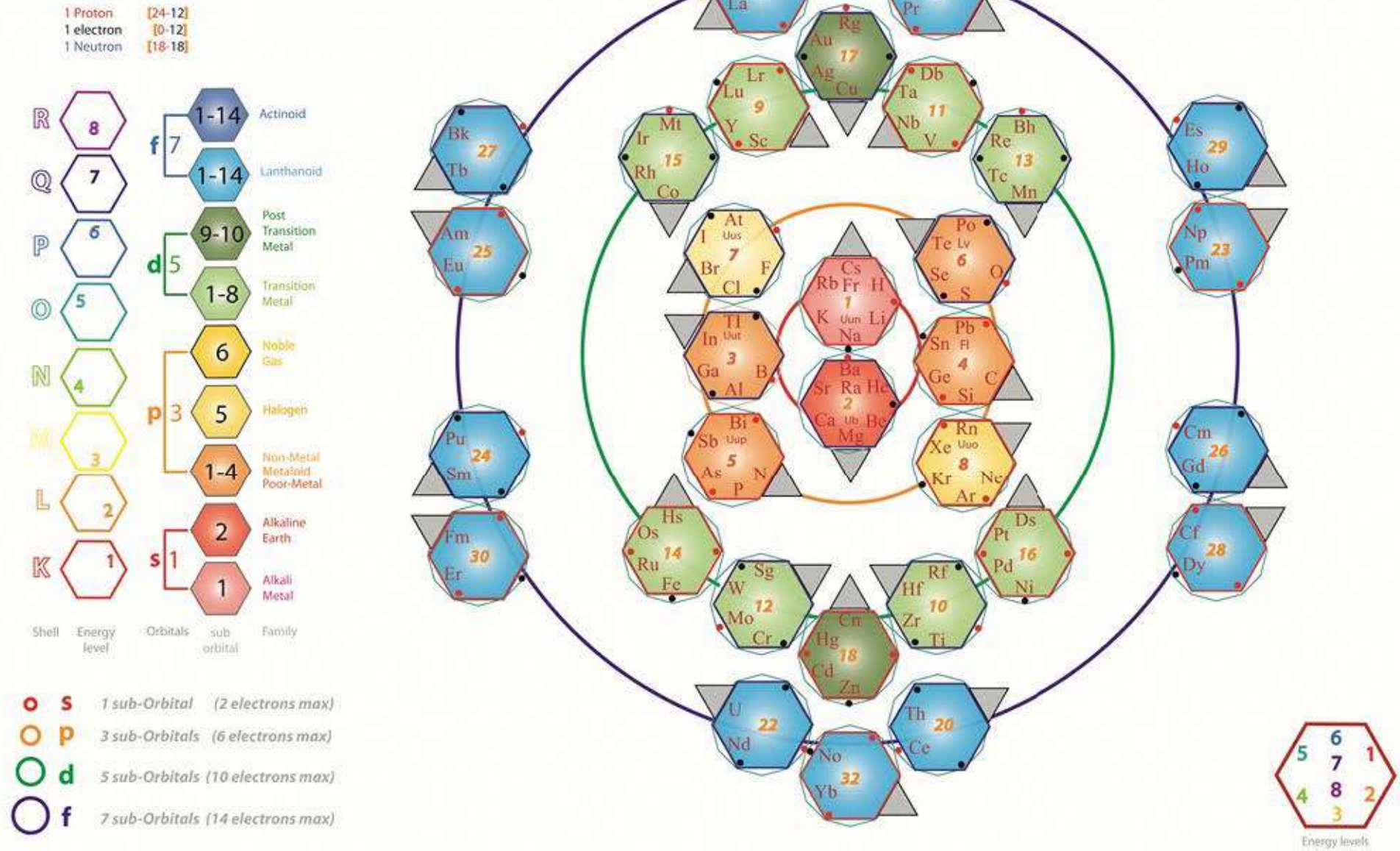
Atomic Nucleus
Exploded view



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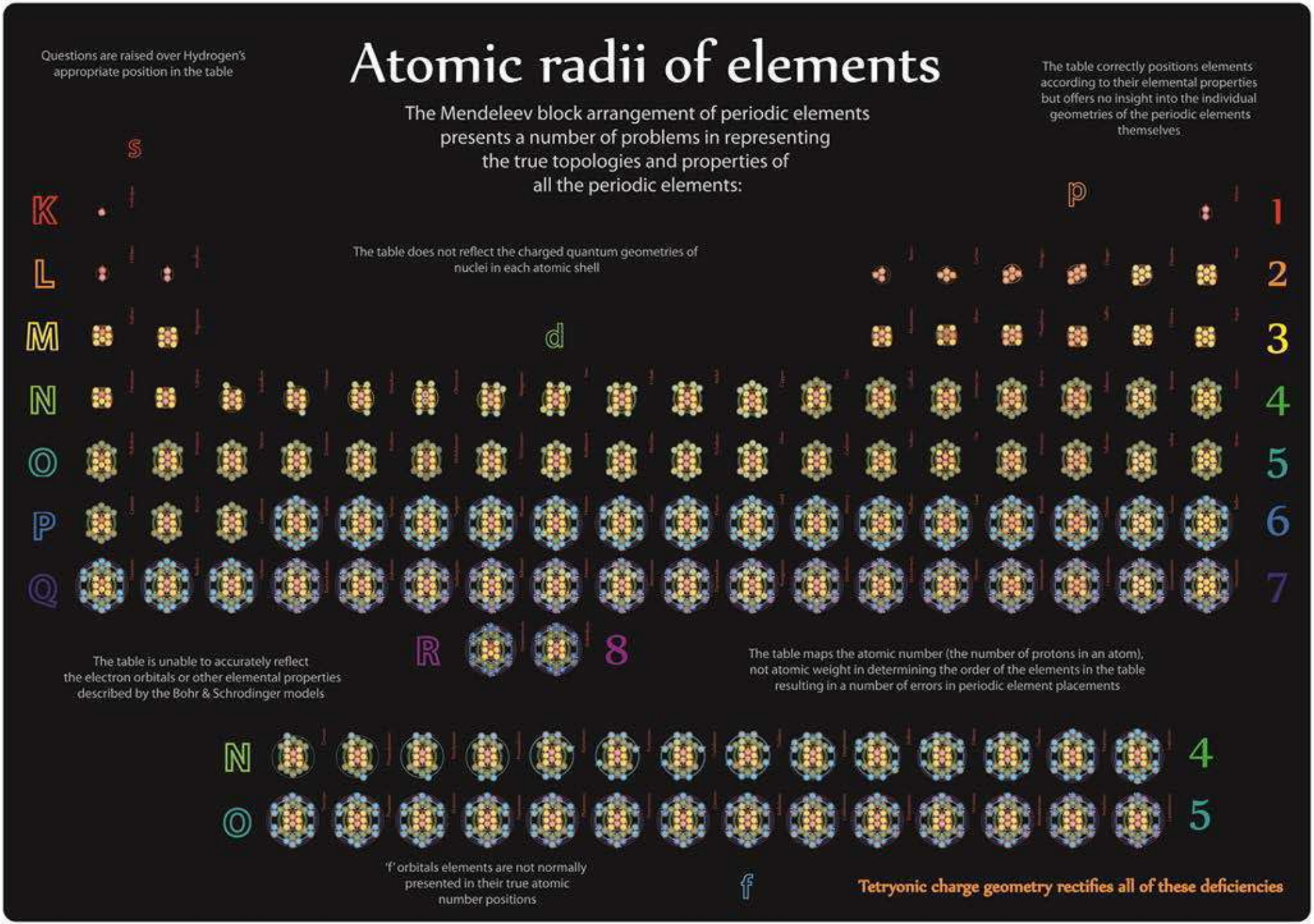
Atomic radii of elements
Questions are raised over Hydrogen's appropriate position in the table
The Mendeleev block arrangement of periodic elements presents a number of problems in representing the true topologies and properties of all the periodic elements:
The table correctly positions elements according to their elemental properties but offers no insight into the individual geometries of the periodic elements themselves
The table does not reflect the charged quantum geometries of nuclei in each atomic shell
s
p
d
f
K
L
M
N
O
P
Q
R
1
2
3
4
5
6
7
8
The table is unable to accurately reflect the electron orbitals or other elemental properties described by the Bohr & Schrodinger models
The table maps the atomic number (the number of protons in an atom), not atomic weight in determining the order of the elements in the table resulting in a number of errors in periodic element placements
'f' orbitals elements are not normally presented in their true atomic number positions
Tetryonic charge geometry rectifies all of these deficiencies

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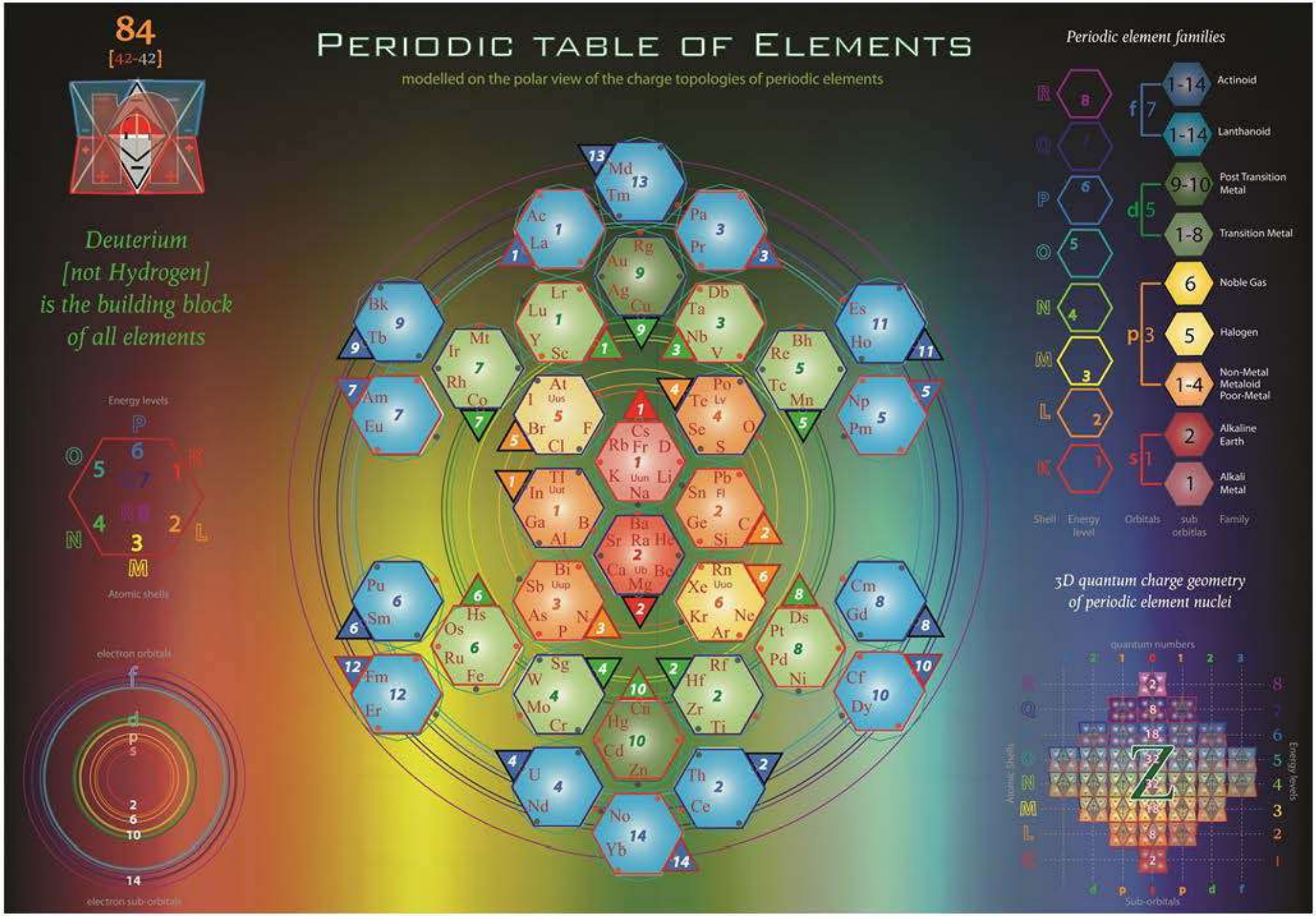

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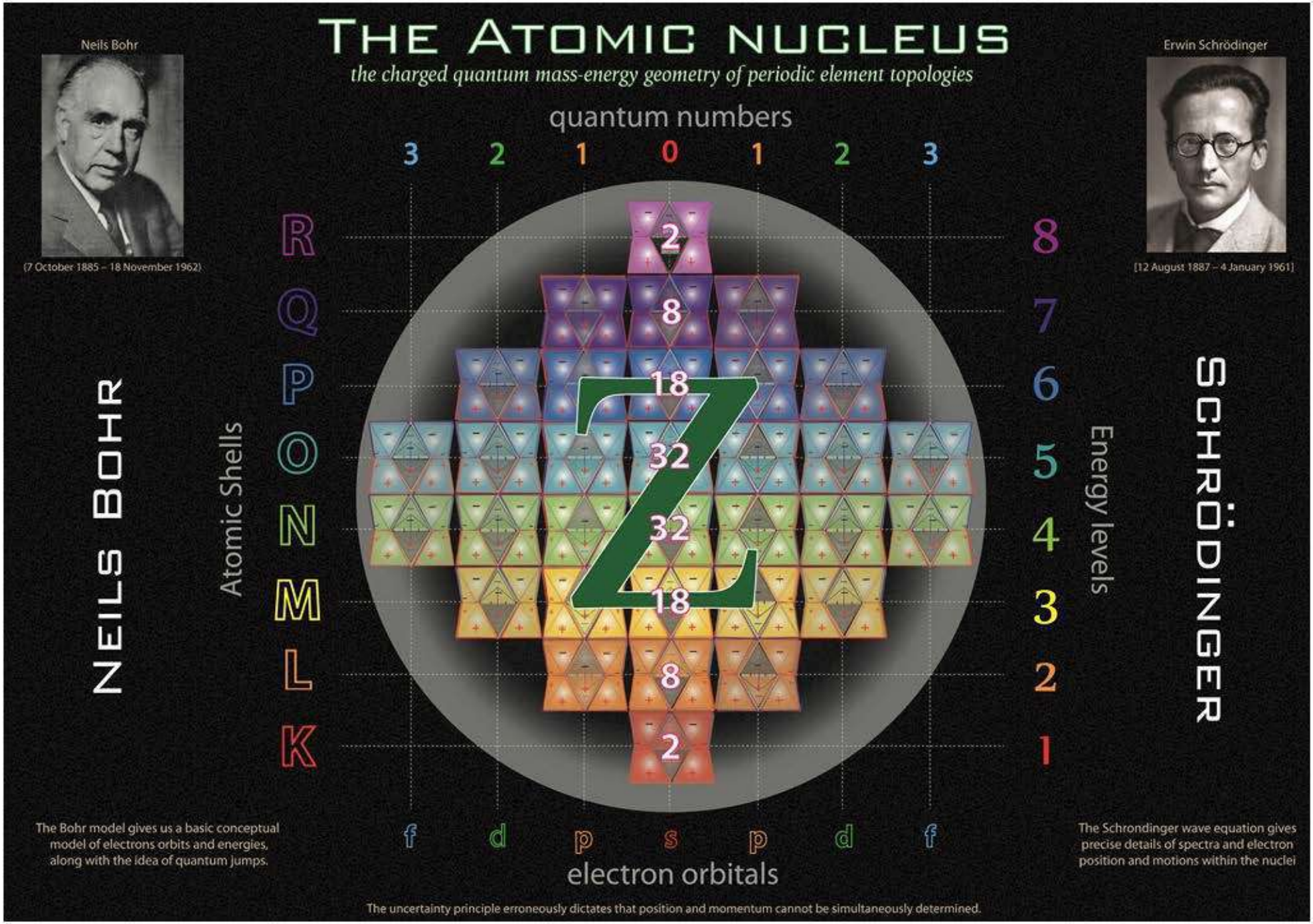
THE ATOMIC NUCLEUS
the charged quantum mass-energy geometry of periodic element topologies
Neils Bohr
(7 October 1885 – 18 November 1962)
Erwin Schrödinger
[12 August 1887 – 4 January 1961]
quantum numbers
3 2 1 0 1 2 3
R Q P O N M L K
Atomic Shells
8 7 6 5 4 3 2 1
Energy levels
NEILS BOHR
SCHRÖDINGER
2
8
18
32
32
18
8
2
Z
f d p s p d f
electron orbitals
The Bohr model gives us a basic conceptual model of electrons orbits and energies, along with the idea of quantum jumps.
The Schrondinger wave equation gives precise details of spectra and electron position and motions within the nuclei
The uncertainty principle erroneously dictates that position and momentum cannot be simultaneously determined.

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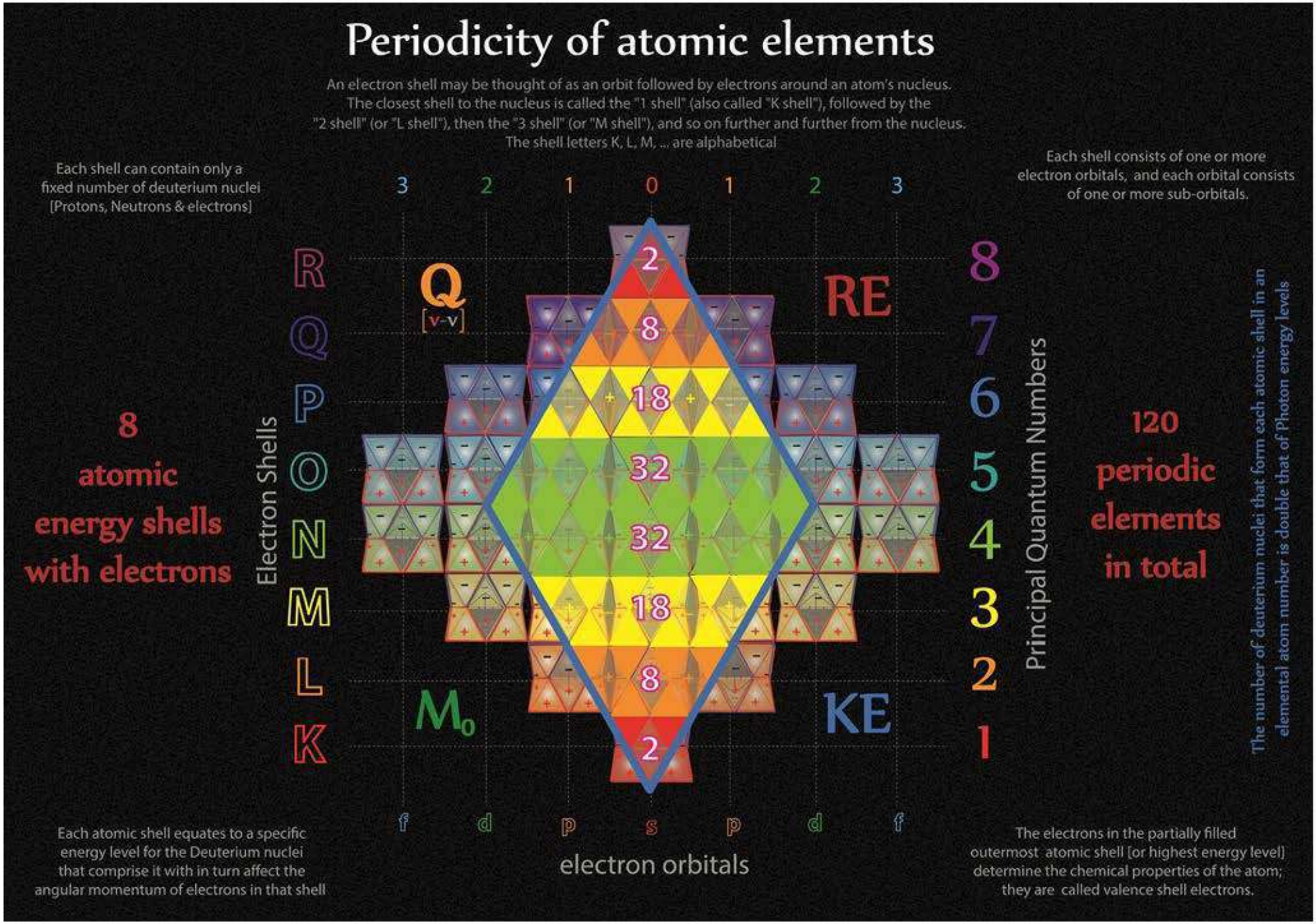
Periodicity of atomic elements
An electron shell may be thought of as an orbit followed by electrons around an atom's nucleus.
The closest shell to the nucleus is called the "1 shell" (also called "K shell"), followed by the
"2 shell" (or "L shell"), then the "3 shell" (or "M shell"), and so on further and further from the nucleus.
The shell letters K, L, M, ... are alphabetical
Each shell can contain only a fixed number of deuterium nuclei [Protons, Neutrons & electrons]
Each shell consists of one or more electron orbitals, and each orbital consists of one or more sub-orbitals.
3 2 1 0 1 2 3
R Q P O N M L K
Electron Shells
Q [v-v]
RE
KE
M_0
2
8
18
32
32
18
8
2
8 7 6 5 4 3 2 1
Principal Quantum Numbers
8 atomic energy shells with electrons
120 periodic elements in total
The number of deuterium nuclei that form each atomic shell in an elemental atom number is double that of Photon energy levels
f d p s p d f
electron orbitals
Each atomic shell equates to a specific energy level for the Deuterium nuclei that comprise it with in turn affect the angular momentum of electrons in that shell
The electrons in the partially filled outermost atomic shell [or highest energy level] determine the chemical properties of the atom; they are called valence shell electrons.

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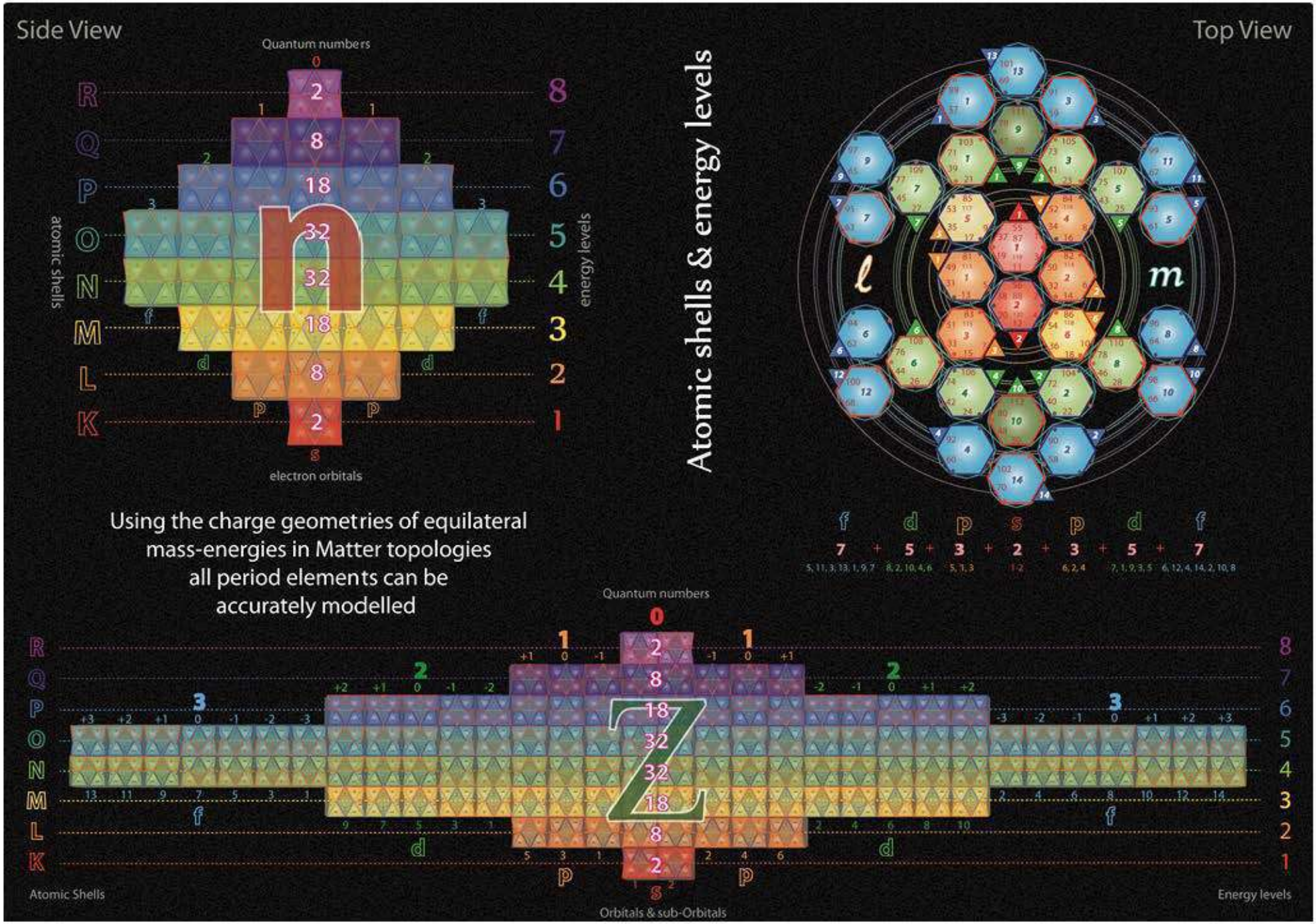

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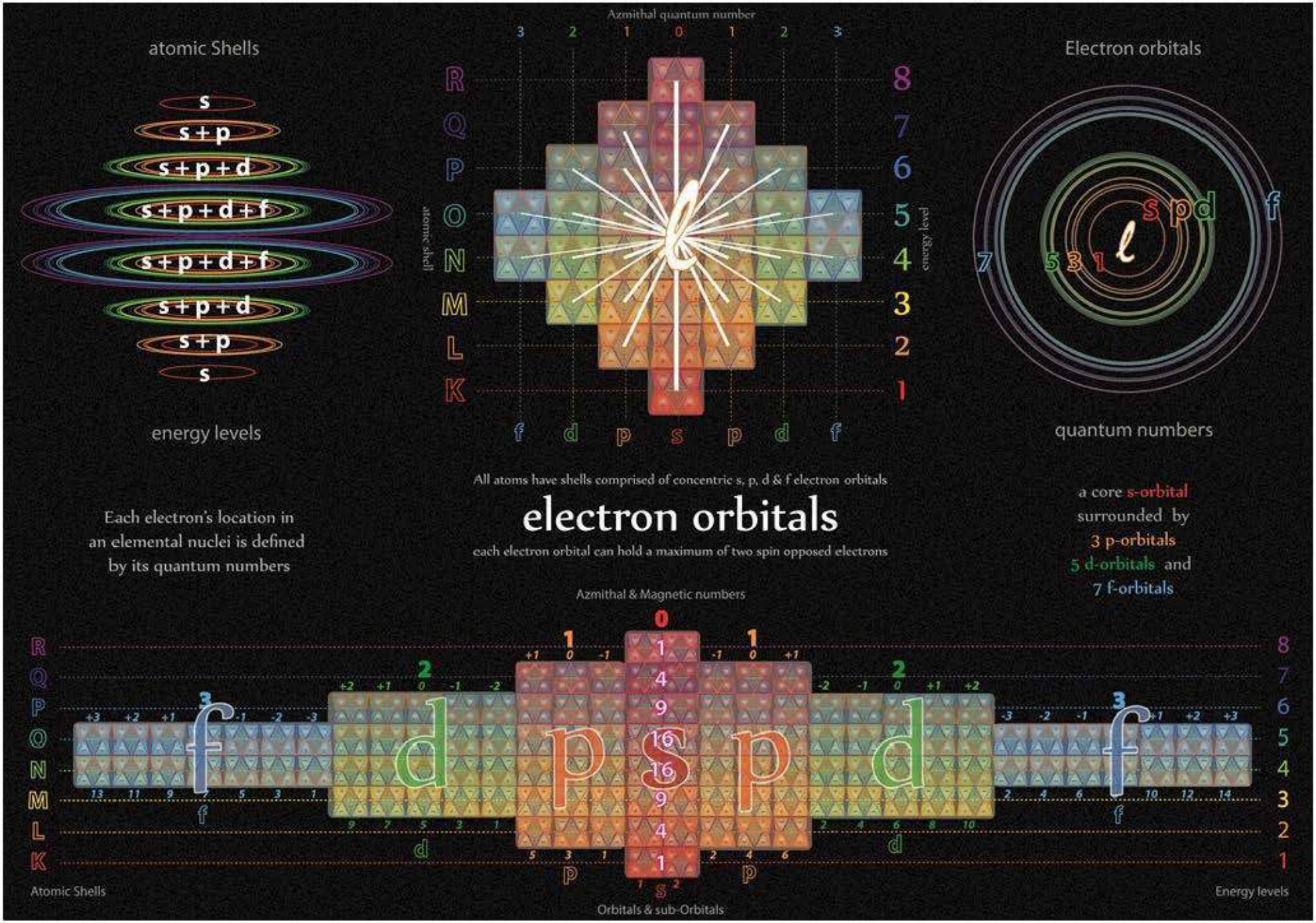
atomic Shells
s
s+p
s+p+d
s+p+d+f
s+p+d+f
s+p+d
s+p
s
energy levels
Azmithal quantum number
3 2 1 0 1 2 3
R Q P O N M L K
8 7 6 5 4 3 2 1
atomic shell
energy level
f d p s p d f
Electron orbitals
s p d f
7 5 3 1
quantum numbers
All atoms have shells comprised of concentric s, p, d & f electron orbitals
electron orbitals
each electron orbital can hold a maximum of two spin opposed electrons
Each electron's location in an elemental nuclei is defined by its quantum numbers
a core s-orbital surrounded by 3 p-orbitals 5 d-orbitals and 7 f-orbitals
Azmithal & Magnetic numbers
Atomic Shells
Energy levels
Orbitals & sub-Orbitals

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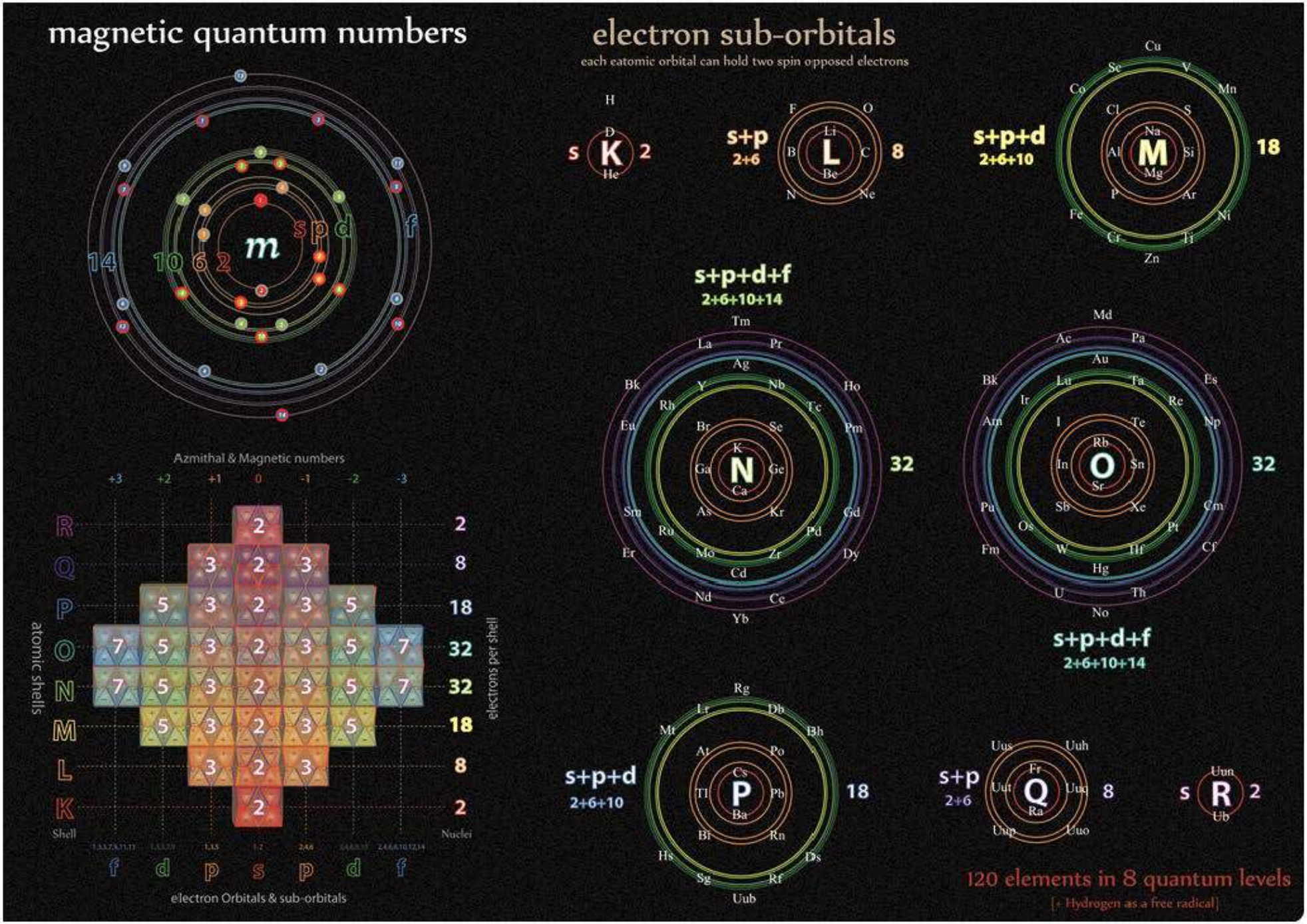
magnetic quantum numbers
m
s p d f
14 10 6 2
Azmithal & Magnetic numbers
+3 +2 +1 0 -1 -2 -3
R Q P O N M L K
atomic shells
electrons per shell
Shell
Nuclei
f d p s p d f
electron Orbitals & sub-orbitals
electron sub-orbitals
each eatomic orbital can hold two spin opposed electrons
s K 2
s+p 2+6 L 8
s+p+d 2+6+10 M 18
s+p+d+f 2+6+10+14 N 32
s+p+d+f 2+6+10+14 O 32
s+p+d 2+6+10 P 18
s+p 2+6 Q 8
s R 2
120 elements in 8 quantum levels
[+ Hydrogen as a free radical]

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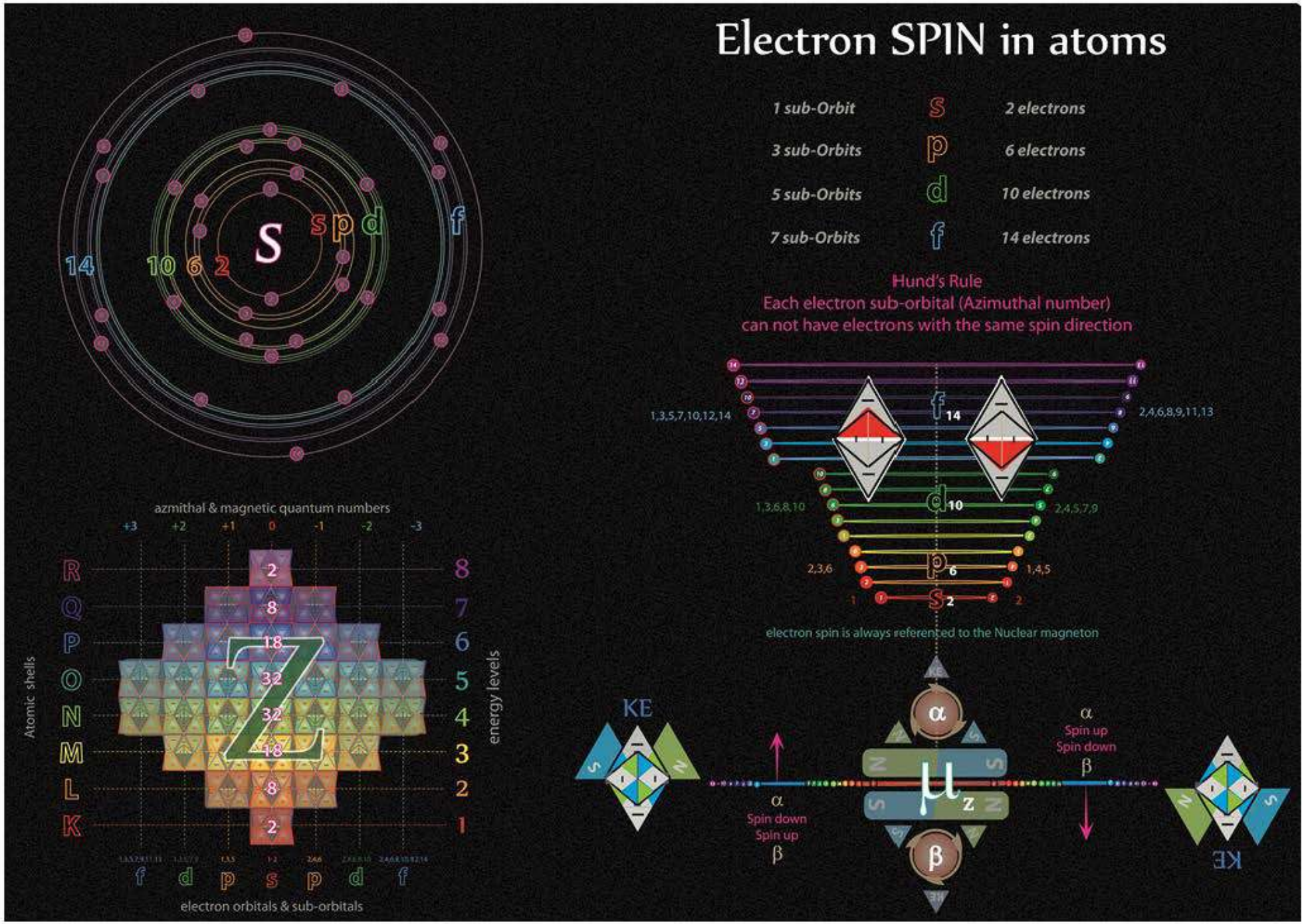

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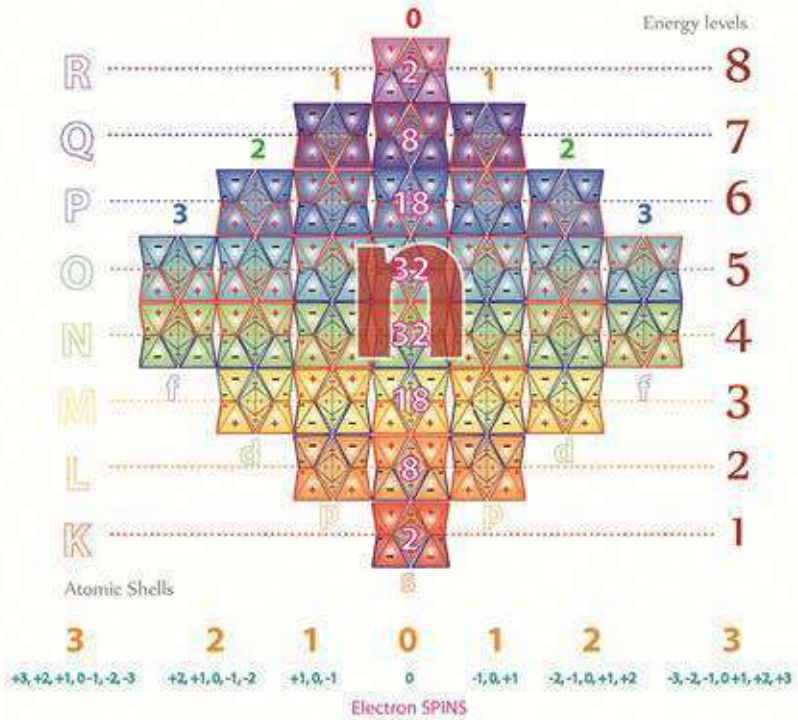
Quantum numbers



The properties of every atom's specific electron configuration can be described by four quantum numbers:

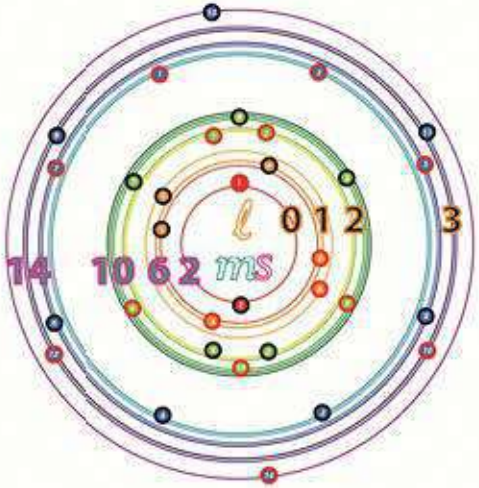
n (1-8)
Principal
(n = 1, 2, 3, 4 ...)

ℓ (0-3)
Azimuthal
(l = 0, 1 ... n−1)

m (2ℓ+1)
Magnetic
(ml = −l, −l+1 ... 0 ... l−1, l)

s ±½
electron Spin
(ms = −1/2 or +1/2).

The Bohr model was a one-dimensional model that used one quantum number to describe the distribution of electrons

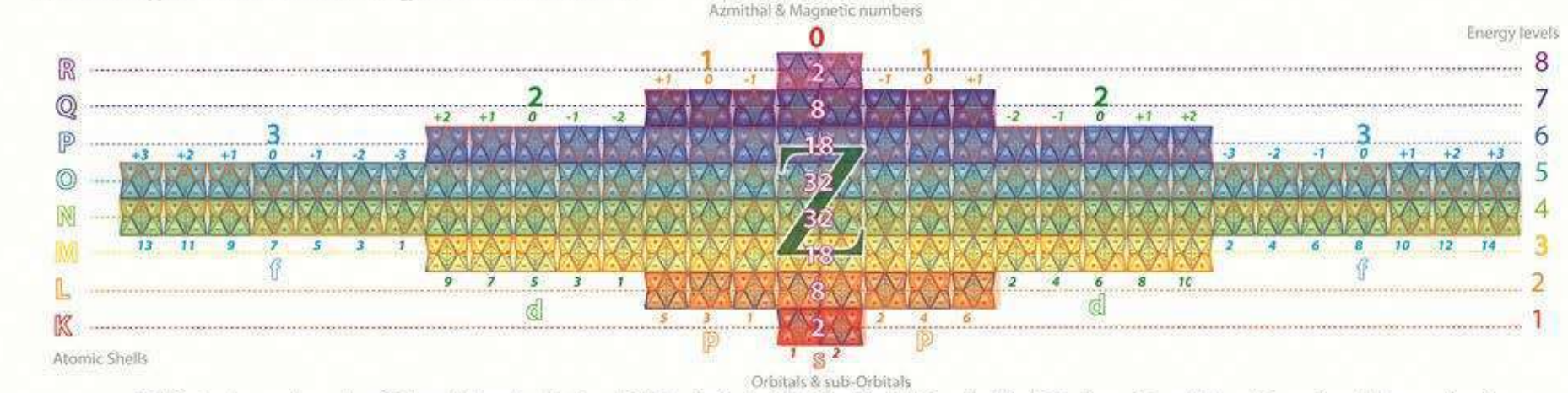


The three coordinates that come from Schrödinger's wave equations are the principal (n), angular (l), and magnetic (m) quantum numbers.

These quantum numbers describe the size, shape, and orientation in space of the orbitals of any particular atom mathematically.

These four numbers, n, ℓ, m and s can be used to describe any electron in a stable atom [and can be mapped back to the classical terminology of Shells and electron orbitals].

Each electron's quantum numbers are unique and cannot be shared by another electron in that atom.



A stable atom has equal numebrs of Protons, electrons [and Neutrons], all following the Pauli Exclusion Principle thus orientating their spins so that each element has a unique electron configuration

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PRINCIPAL quantum number

The first describes the electron shell, or energy level, of an atom.

This is the only quantum number introduced by the Bohr model

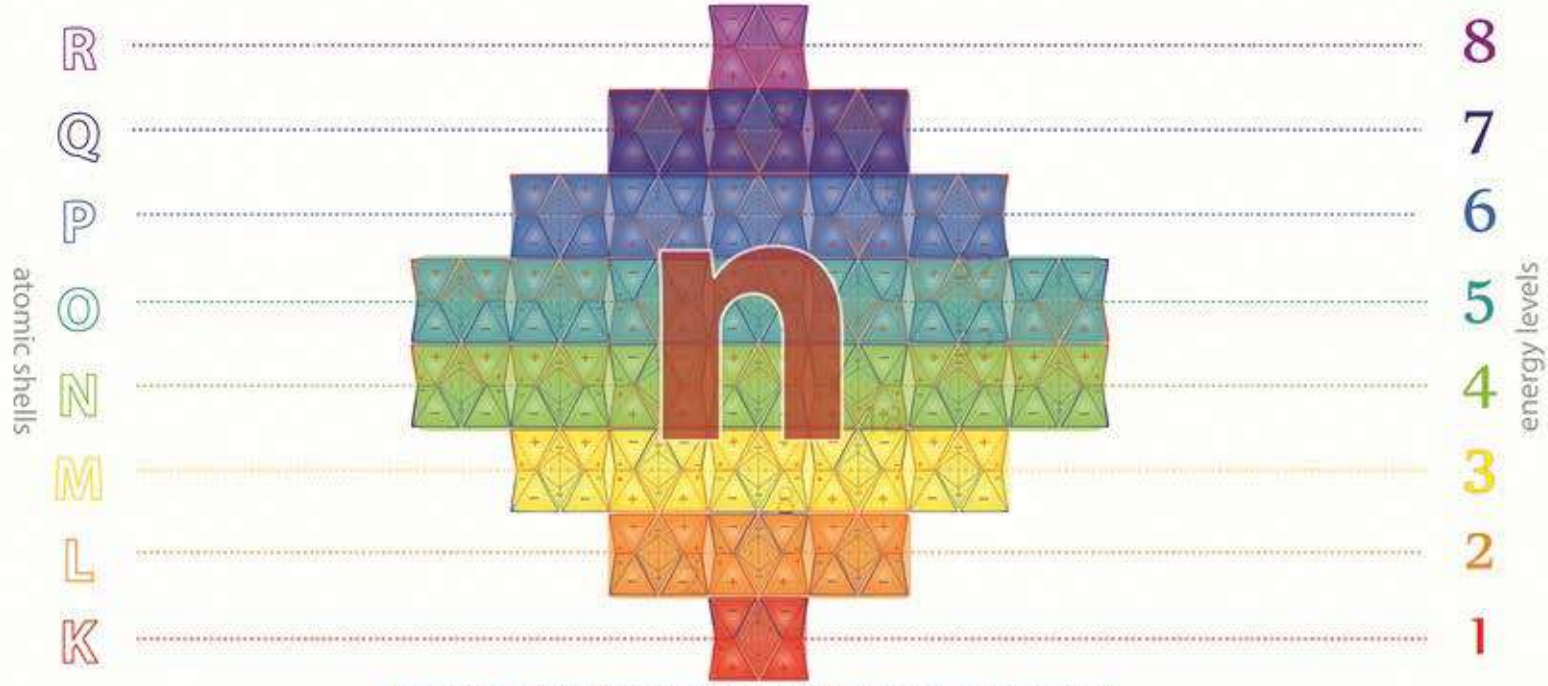
atomic shells

n(1-8)

(n = 1, 2, 3, 4 ...)

The principal quantum number can only have positive integer values

energy levels



As energies of the Baryons comprising the atomic nuclei increases, the electron bound to each nuclei also possesses more KEM field energies and is therefore less tightly bound to the nucleus

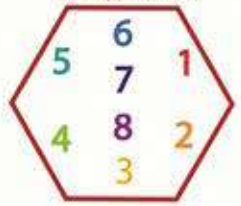
Atomic Shells

(K, L, M, N, O, P, Q, R)

Atomic shells relate directly to Principal quantum numbers

(1, 2, 3, 4, 5, 6, 7, 8)

Energy levels



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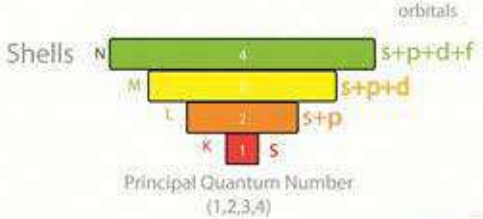
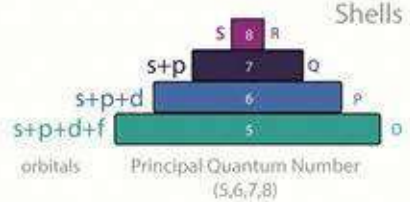
AZMITHAL quantum number

The azimuthal quantum number is a quantum number assigned to any atomic orbital that describes its orbital angular momentum and determines the shape of the electron orbital



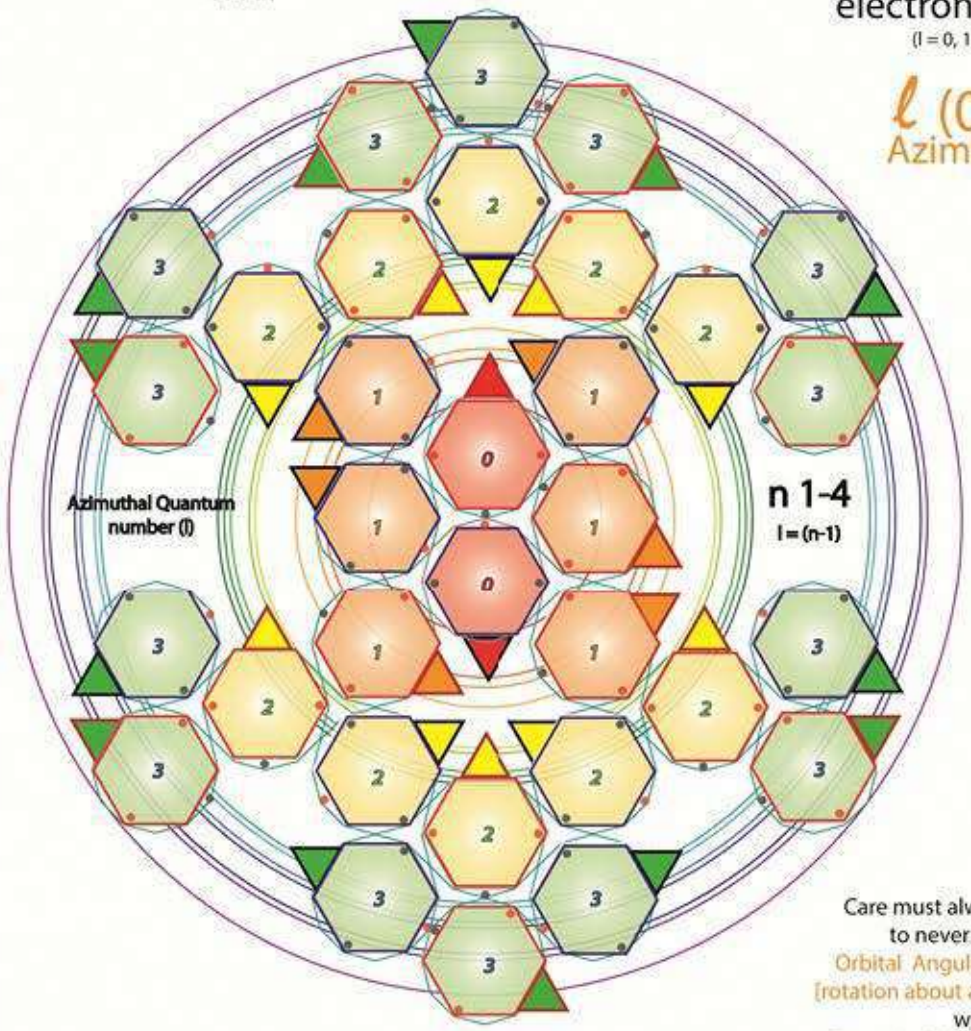


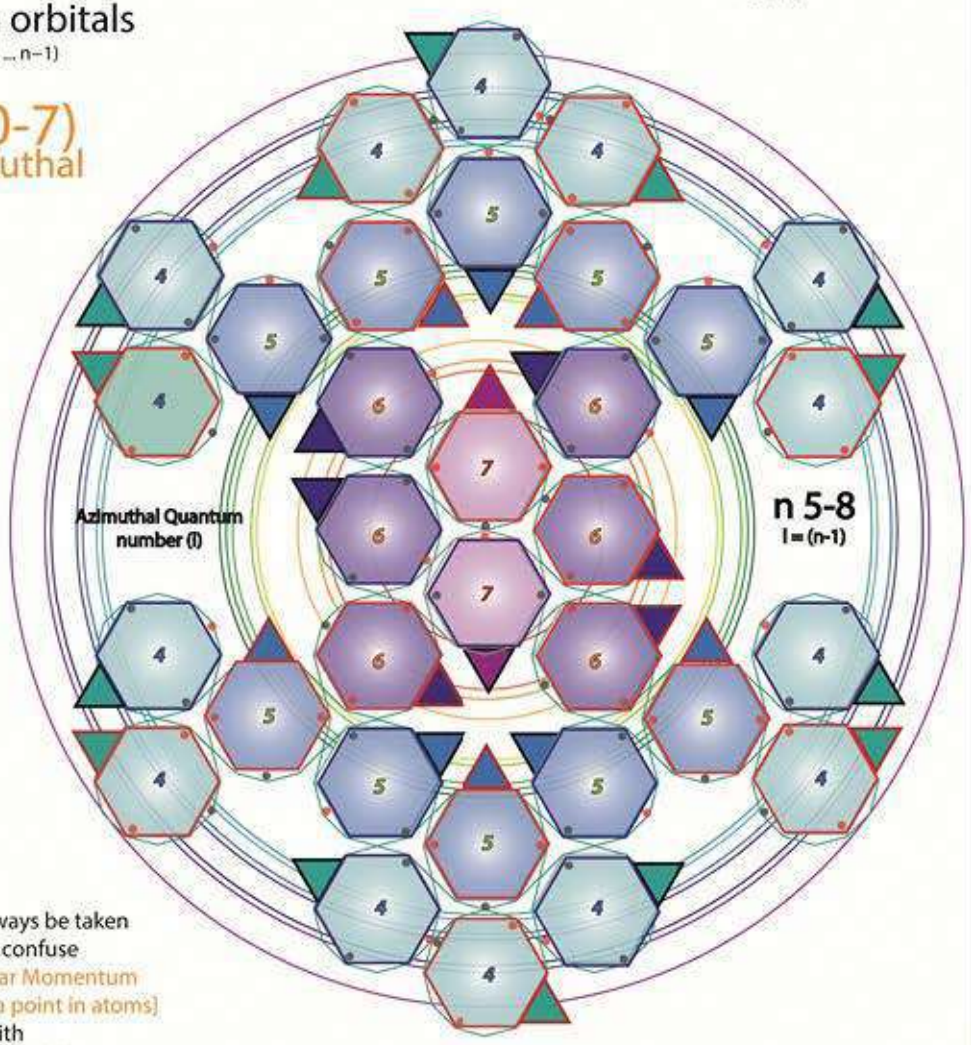
s p d f

electron orbitals

(l = 0, 1 .., n−1)

ℓ (0-7)
Azimuthal





Care must always be taken
to never confuse
Orbital Angular Momentum
[rotation about a point in atoms]
with
Quantised Angular Momenta
[equilateral Planck energy geometries]

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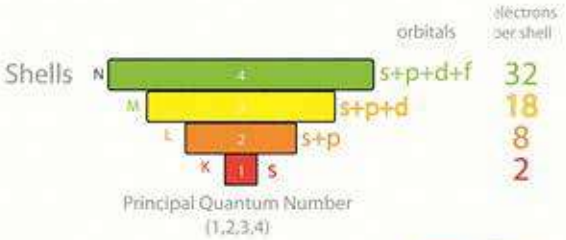
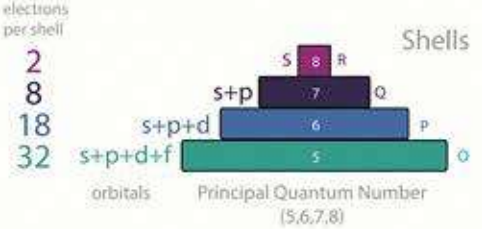
MAGNETIC quantum number



The magnetic quantum number denotes the energy levels available within any subshell

Magnetic numbers do not continue to increase as the Principal numbers increase instead they reverse after n4 to reflect the charged quanutm geometry of Elements and do not follow the current computer models in popular use



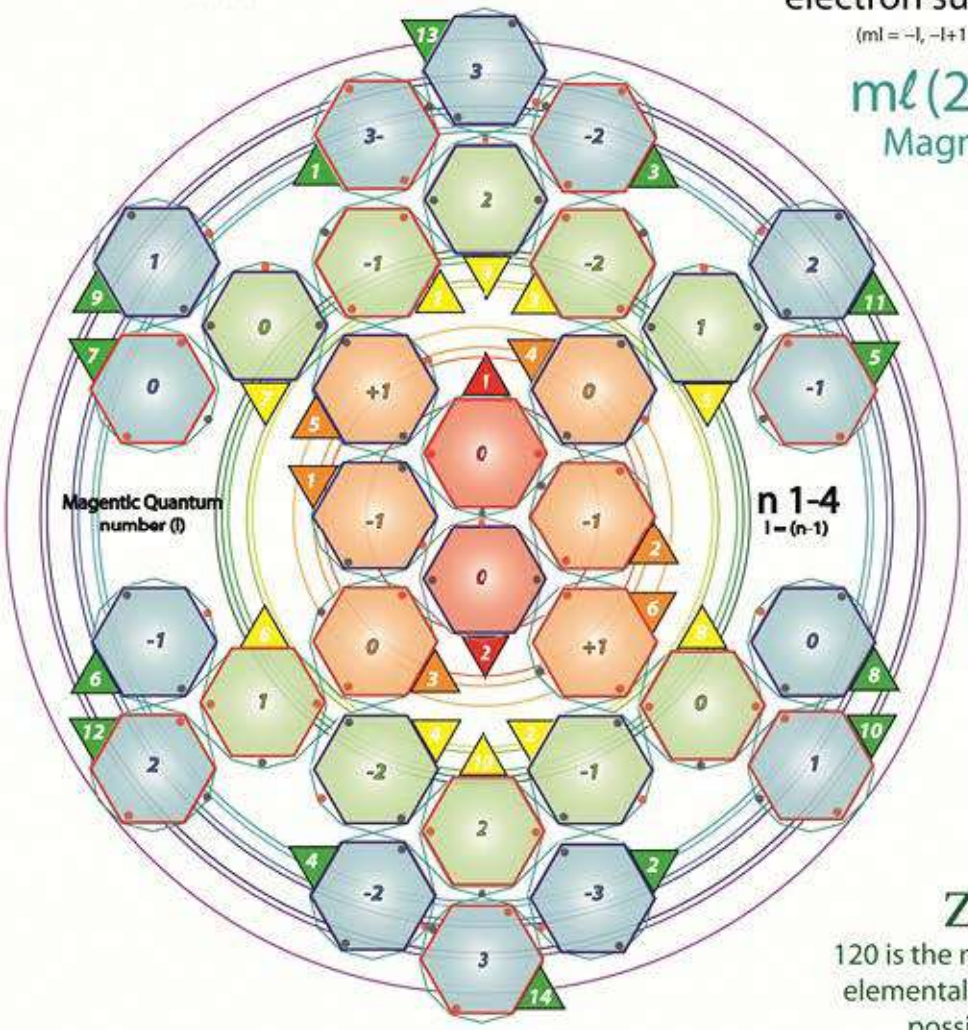
s p d f

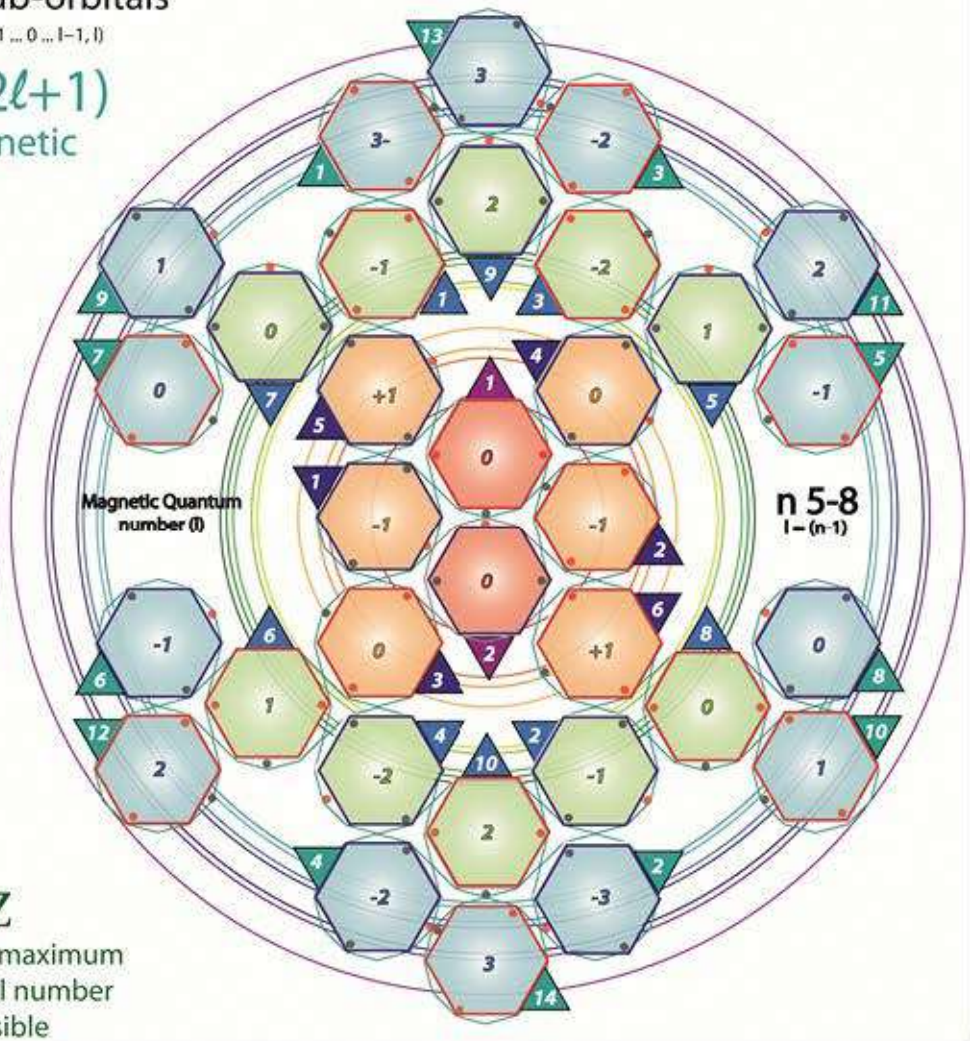
electron sub-orbitals

(ml = −l, −l+1 ... 0 ... l−1, l)

$m\ell\,(2\ell+1)$

Magnetic





Z

120 is the maximum elemental number possible

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SPIN quantum number

The spin quantum number is a quantum number that parameterizes the intrinsic angular momentum (or spin angular momentum), of any given electron anywhere in an atomic nucleus

parallel magnetic moments

Spin UP

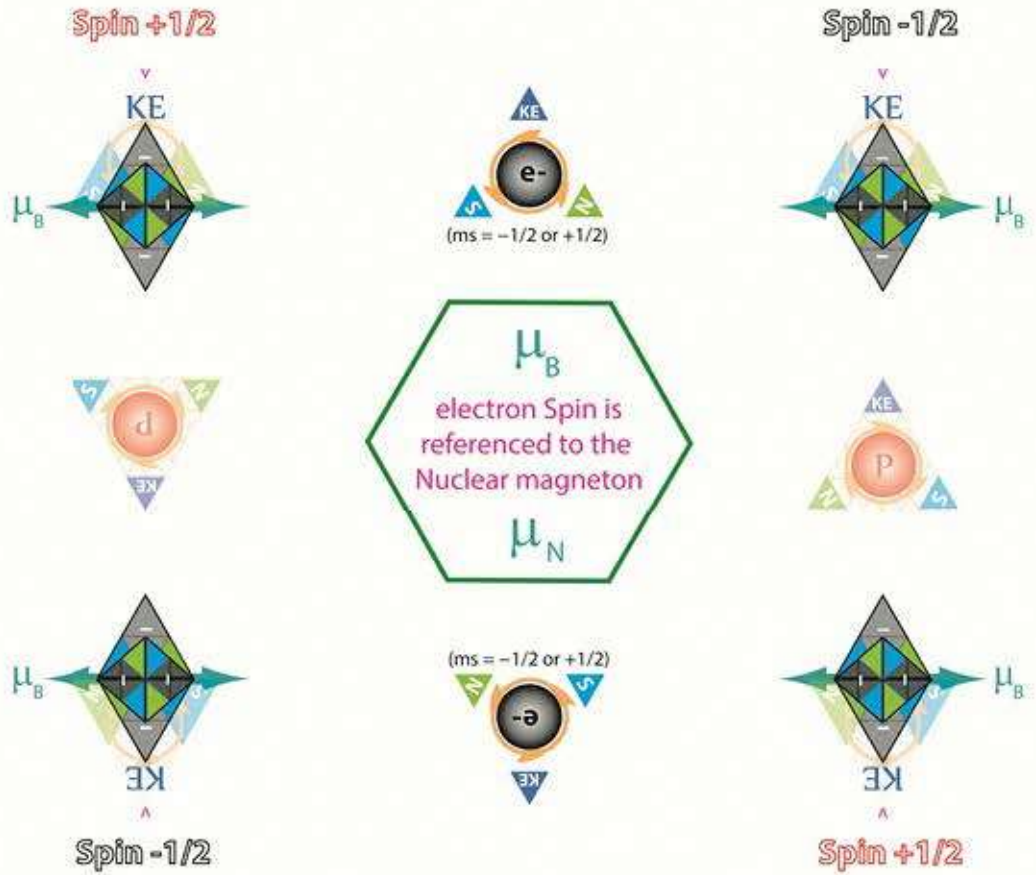
higher coupling energies

anti-parallel magnetic moments

Spin DOWN

lower coupling energies

Electron spin can orientate in either direction within Nuclei, providing the nett spins follow the Hund rule and Pauli exclusion principle



The nuclear energy levels of the Baryons comprising Elemental nuclei determine the energy-momenta of electrons bound to them

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Modifying Hund's Rule

Electrons fill orbitals in an alternating sequential numbering pattern due to nucleon placement creating opposed direction electron spins

The increased stability of the atom, most commonly manifested in a lower energy state, arises because the high-spin state forces the unpaired electrons to reside in different spatial orbitals.

A commonly given reason for the increased stability of high multiplicity states is that the different occupied spatial orbitals create a larger average distance between electrons, reducing electron-electron repulsion energy. In reality, it has been shown that the actual reason behind the increased stability is a decrease in the screening of electron-nuclear attractions[1].

The total spin state is calculated as the total number of unpaired electrons + 1, or twice the total spin + 1 written as 2s+1.

As a result of Hund's rule, constraints are placed on the way atomic orbitals are filled using the Aufbau principle.

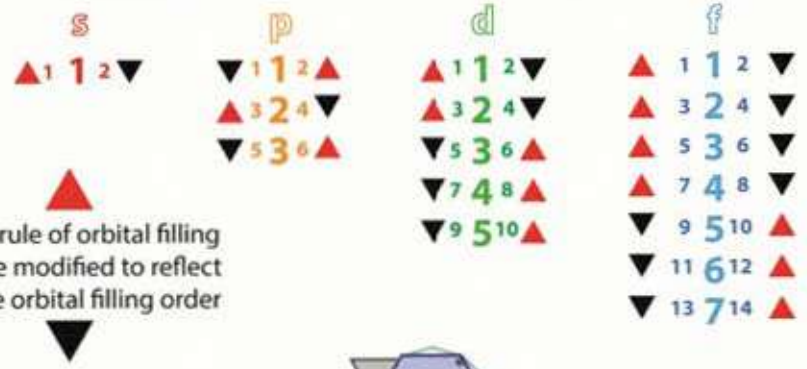
Before any two electrons occupy an orbital in a subshell, other orbitals in the same subshell must first each contain one electron. Also, the electrons filling a subshell will have parallel spin before the shell starts filling up with the opposite spin electrons (after the first orbital gains a second electron).

As a result, when filling up atomic orbitals, the maximum number of unpaired electrons (and hence maximum total spin state) is assured

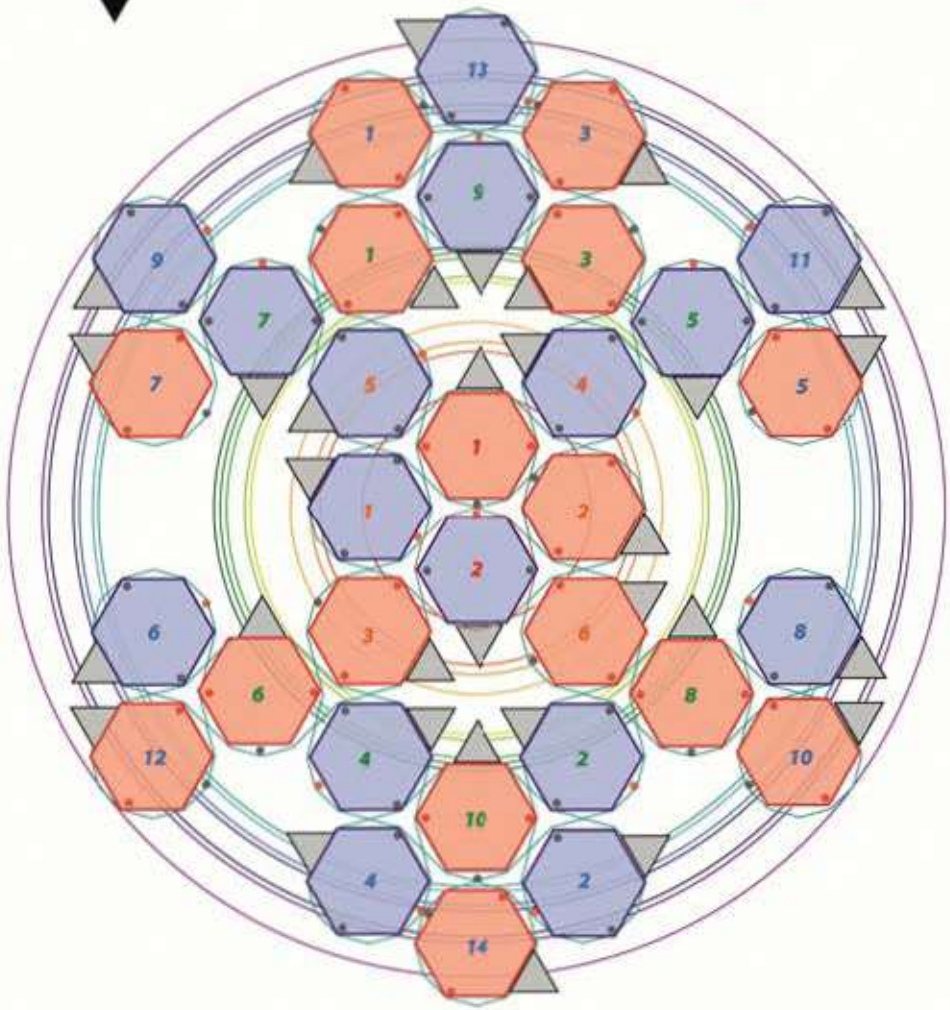
Sub-orbitals fill in order of numbering

Electrons spins pair before next orbital is filled

ie.
p1 [DOWN] and p2 [UP] fill before
p3 [UP] and p4 [DOWN] before
p5 [DOWN] and p6 [UP] etc



Hund's rule of orbital filling must be modified to reflect the true orbital filling order



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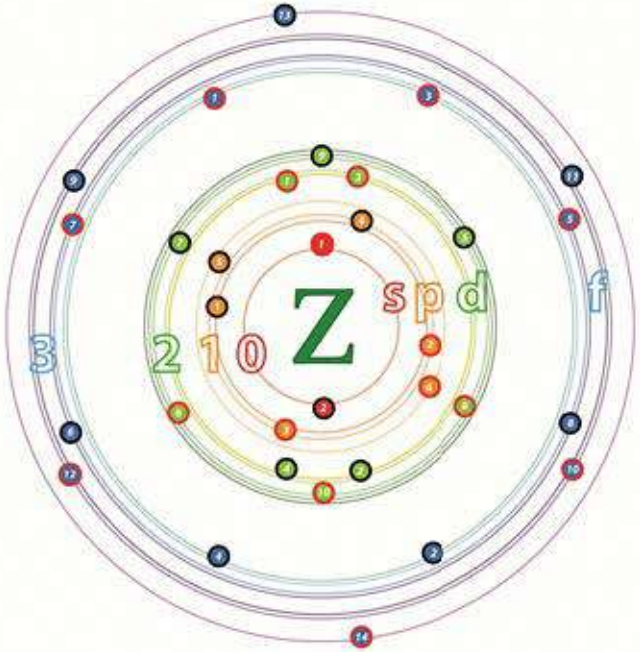
Principle quantum Energies



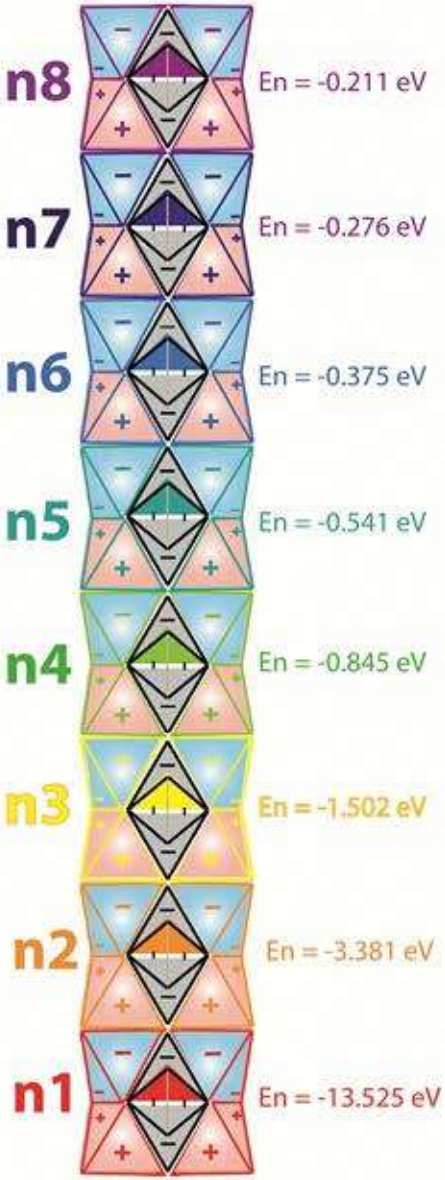
In an atom - electron energies are proportional to their intrinsic Kinetic Energies - which in turn are directly proportional to the quantum energy level of the nuclei which the electron binds to in their respective atomic shells

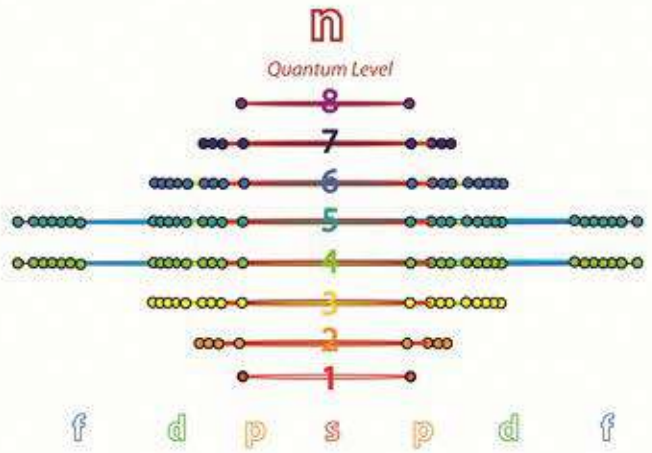
In a nucleus, lower energy orbits have less 'paired' nuclei supplying energy. The more energy you give a nuclei the faster it casuses the bound electron to rotate. If you give the nuclei enough energy, it will impart eneough energy to its electron for it to leave the system entirely.

The same is true for an electron orbital. Higher values of n mean more energy for the electron and the corresponding KEM field enegies of the electron is larger, resulting in increased angular momentum.

Values of n start at 1 and go up by integer amounts.

If enough energy is added to the system by incident Photons a electron will leave the atom creating a positively charged nuclei [ionisation].





s orbits n1-8
p orbits n2-7
d orbits n3-6
f orbits n4-5

Eigenstate value

KEM field energy [per n] required to exceed 13.525 eV at which point the photo-electron has sufficient KE to break free of the Nucleus

$$E_n = \frac{E_1}{n^2} = \frac{-13.6eV}{n^2}, n = 1, 2, 3...$$

The possible Kinetic Energies (quantum levels) of an electron are directly related to the energy level of the Nuclei in each Quantum Level

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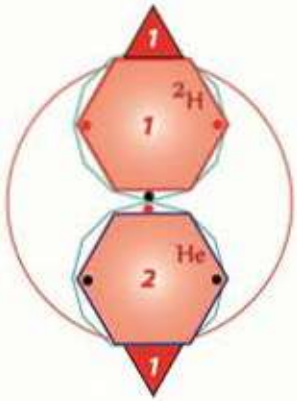
Quantum Level 1

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons	2
1	1s1	Deuterium	1	1	1	
2	1s2	Helium	2	2	2	

Deuterium [not Hydrogen] is the building block of elements



K shell

n1

Ground State electron

$iE = -13.313\ eV$

Z #		Name	Protons	electrons	Neutrons
1	1s1	Hydrogen	1	1	0

Hydrogen is a free radical element

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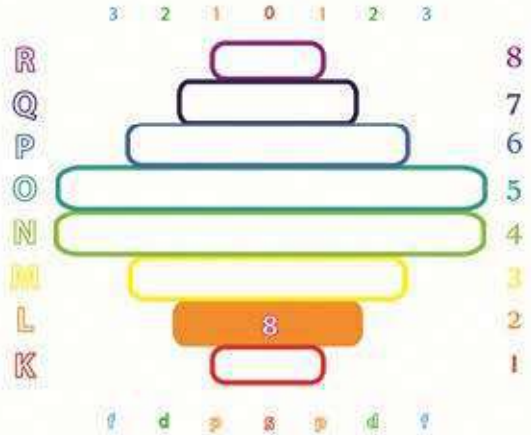
Quantum Level 2

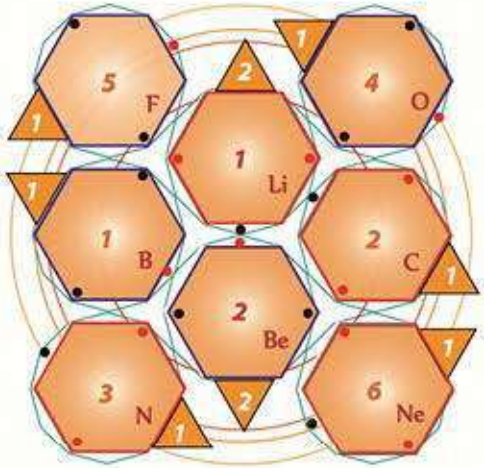
The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
3	2s1	Lithium	3	3	3
4	2s2	Berylium	4	4	4
5	1p1	Boron	5	5	5
6	1p2	Carbon	6	6	6
7	1p3	Nitrogen	7	7	7
8	1p4	Oxygen	8	8	8
9	1p5	Fluorine	9	9	9
10	1p6	Neon	10	10	10

8

Deuterium [not Hydrogen] is the building block of elements



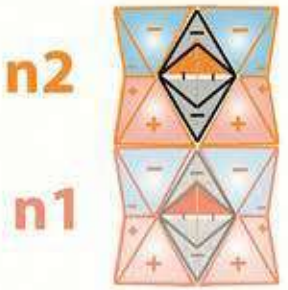


L shell

n2

Ground State electron

$iE = -12.679\ eV$



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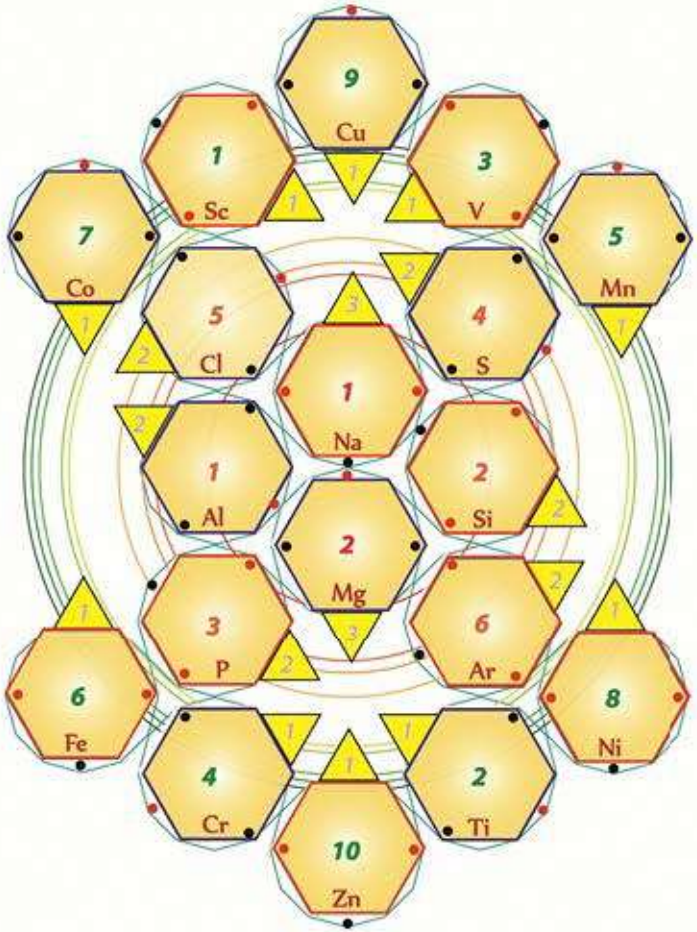
Quantum Level 3

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
11	3s1	Sodium	11	11	11
12	3s2	Magnesium	12	12	12
13	2p1	Aluminium	13	13	13
14	2p2	Silicon	14	14	14
15	2p3	Phosphorus	15	15	15
16	2p4	Sulfur	16	16	16
17	2p5	Chlorine	17	17	17
18	2p6	Argon	18	18	18
21	3d1	Scandium	21	21	21
22	3d2	Titanium	22	22	22
23	3d3	Vanadium	23	23	23
24	3d4	Chromium	24	24	24
25	3d5	Manganese	25	25	25
26	3d6	Iron	26	26	26
27	3d7	Cobalt	27	27	27
28	3d8	Nickel	28	28	28
29	3d9	Copper	29	29	29
30	3d10	Zinc	30	30	30

18

Deuterium [not Hydrogen] is the building block of elements



M shell

n3

Ground State electron

$iE = -11.623\ eV$

Energy level

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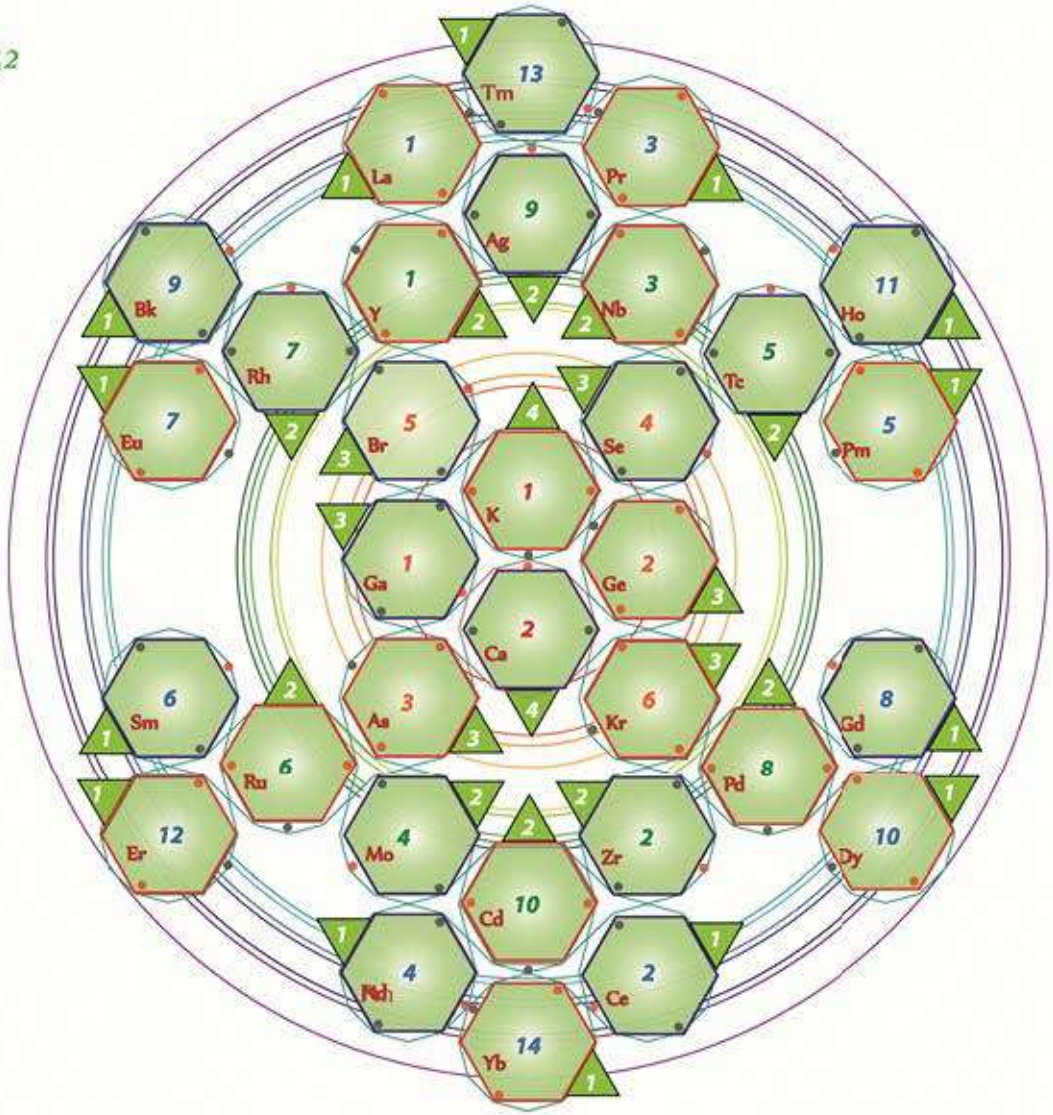
Quantum Level 4

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
19	4s1	Potassium	19	19	19
20	4s2	Calcium	20	20	20
31	4p1	Gallium	31	31	31
32	4p2	Germanium	32	32	32
33	4p3	Arsenic	33	33	33
34	4p4	Selenium	34	34	34
35	4p5	Bromine	35	35	35
36	4p6	Krypton	36	36	36
39	4d1	Yttrium	39	39	39
40	4d2	Zirconium	40	40	40
41	4d3	Niobium	41	41	41
42	4d4	Molybdenum	42	42	42
43	4d5	Technetium	43	43	43
44	4d6	Ruthenium	44	44	44
45	4d7	Rhodium	45	45	45
46	4d8	Palladium	46	46	46
47	4d9	Silver	47	47	47
48	4d10	Cadmium	48	48	48
57	4f1	Lanthanum	57	57	57
58	4f2	Cerium	58	58	58
59	4f3	Praseodymium	59	59	59
60	4f4	Neodymium	60	60	60
61	4f5	Promethium	61	61	61
62	4f6	Samarium	62	62	62
63	4f7	Europium	63	63	63
64	4f8	Gadolinium	64	64	64
65	4f9	Terbium	65	65	65
66	4f10	Dysprosium	66	66	66
67	4f11	Holium	67	67	67
68	4f12	Erbium	68	68	68
69	4f13	Thulium	69	69	69
70	4f14	Ytterbium	70	70	70

32

Deuterium [not Hydrogen] is the building block of elements



N shell

n4

Ground State electron

$iE = -10.143\ eV$

Energy level

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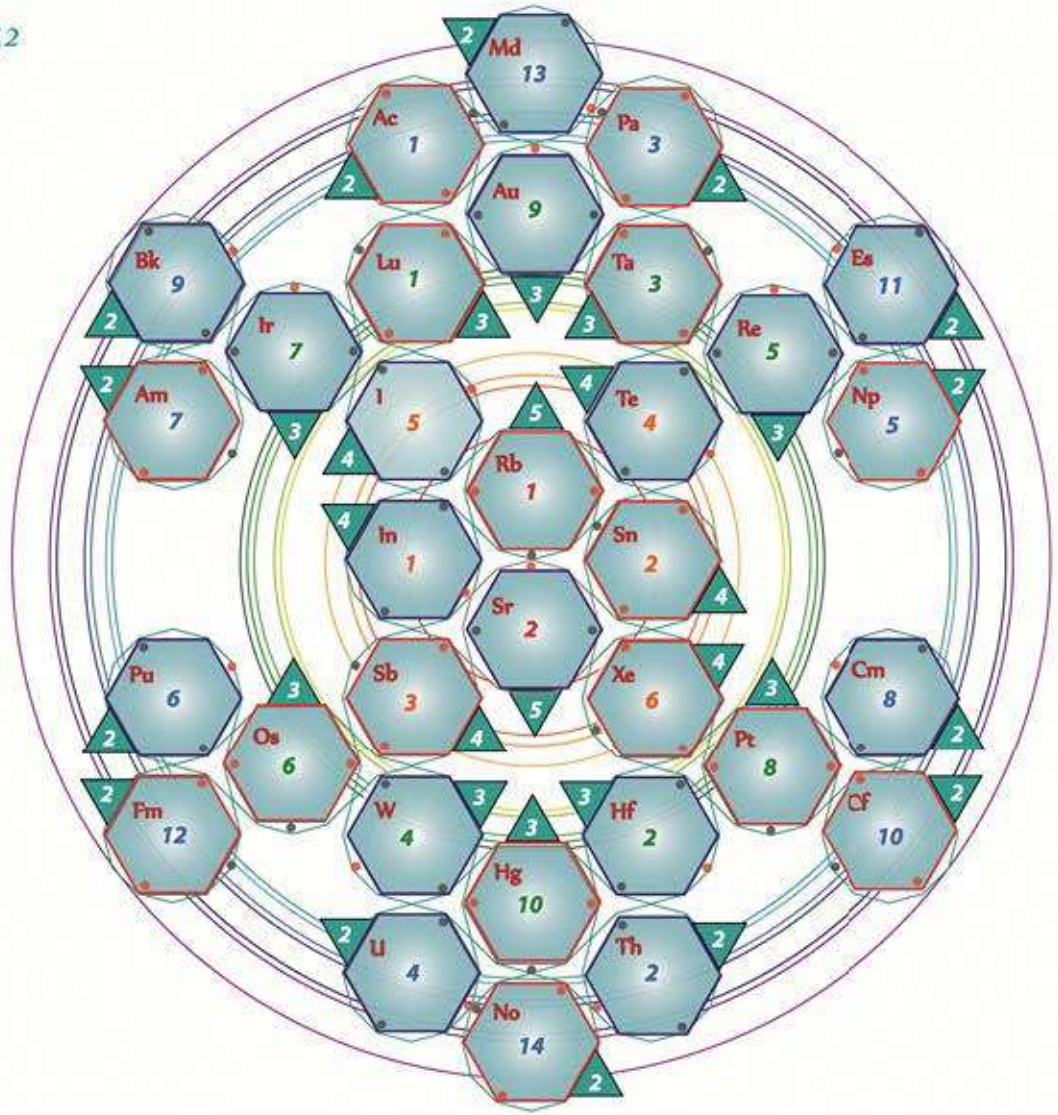
Quantum Level 5

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
37	5s1	Rubidium	37	37	37
38	5s2	Strontium	38	38	38
49	5p1	Indium	49	49	49
50	5p2	Tin	50	50	50
51	5p3	Antimony	51	51	51
52	5p4	Tellurium	52	52	52
53	5p5	Iodine	53	53	53
54	5p6	Xenon	54	54	54
71	5d1	Lutetium	71	71	71
72	5d2	Hafnium	72	72	72
73	5d3	Tantalum	73	73	73
74	5d4	Tungsten	74	74	74
75	5d5	Rhenium	75	75	75
76	5d6	Osmium	76	76	76
77	5d7	Iridium	77	77	77
78	5d8	Platinum	78	78	78
79	5d9	Gold	79	79	79
80	5d10	Mercury	80	80	80
89	5f1	Actinium	89	89	89
90	5f2	Thorium	90	90	90
91	5f3	Protactium	91	91	91
92	5f4	Uranium	92	92	92
93	5f5	Neptunium	93	93	93
94	5f6	Plutonium	94	94	94
95	5f7	Americium	95	95	95
96	5f8	Curium	96	96	96
97	5f9	Berkelium	97	97	97
98	5f10	Californium	98	98	98
99	5f11	Einsteinium	99	99	99
100	5f12	Fermium	100	100	100
101	5f13	Mendelevium	101	101	101
102	5f14	Nobelium	102	102	102

32

Deuterium [not Hydrogen] is the building block of elements



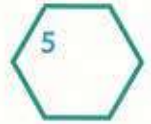
O shell

n5

Ground State electron

$iE = -8.241\ eV$

Energy level



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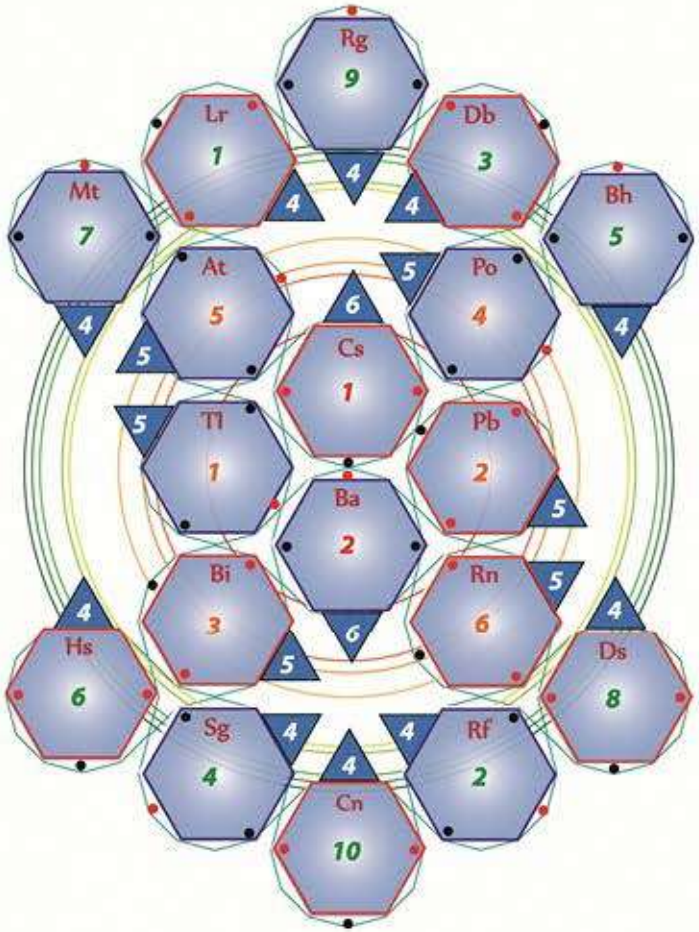
Quantum Level 6

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
55	6s1	Caesium	55	55	55
56	6s2	Barium	56	56	56
81	6p1	Thallium	81	81	81
82	6p2	Lead	82	82	82
83	6p3	Bismuth	83	83	83
84	6p4	Polonium	84	84	84
85	6p5	Astatine	85	85	85
86	6p6	Radon	86	86	86
103	6d1	Lawrencium	103	103	103
104	6d2	Rutherfordium	104	104	104
105	6d3	Dubnium	105	105	105
106	6d4	Seaborgium	106	106	106
107	6d5	Bohrium	107	107	107
108	6d6	Hassium	108	108	108
109	6d7	Meitnerium	109	109	109
110	6d8	Darmstadtium	110	110	110
111	6d9	Roetgenium	111	111	111
112	6d10	Copernicium	112	112	112

18

Deuterium [not Hydrogen] is the building block of elements

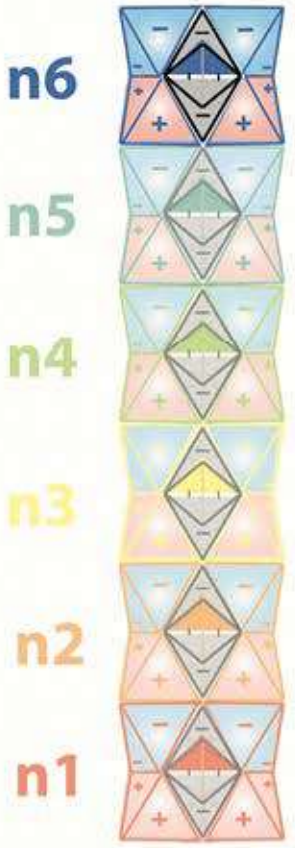


P shell

n6

Ground State electron

$iE = -5.917\ eV$



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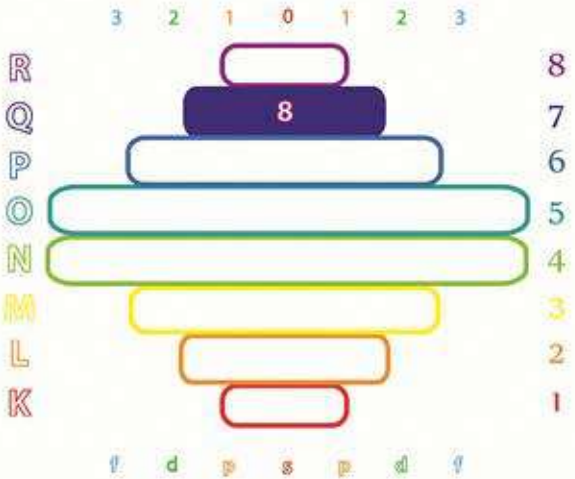
Quantum Level 7

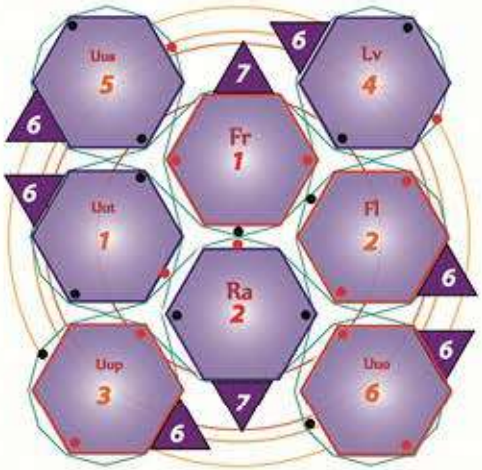
The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
87	7s1	Francium	87	87	87
88	7s2	Radium	88	88	88
113	7p1	Ununtrium	113	113	113
114	7p2	Flerovium	114	114	114
115	7p3	Ununpentium	115	115	115
116	7p4	Livermorium	116	116	116
117	7p5	Ununseptium	117	117	117
118	7p6	Ununoctium	118	118	118

8

Deuterium [not Hydrogen] is the building block of elements





Energy level

Q shell

n7

Ground State electron

$iE = -3.169\ eV$

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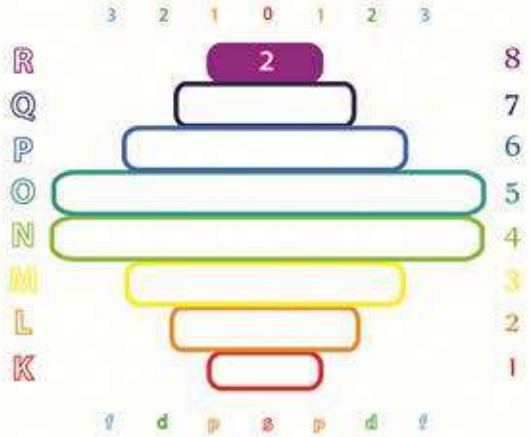
Quantum Level 8

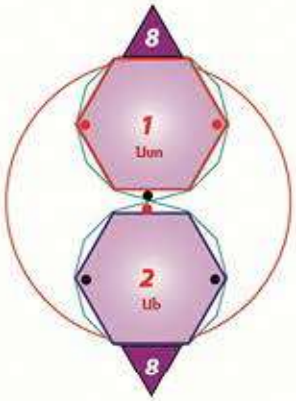
The energy levels of bound electrons is determined by Baryons

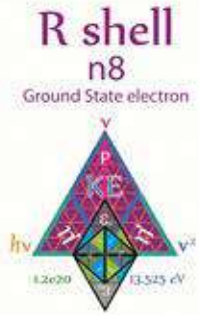
Z #		Name	Protons	electrons	Neutrons
119	8s1	Ununnonium	119	119	119
120	8s2	Unbinilium	120	120	120

2

Deuterium [not Hydrogen] is the building block of elements







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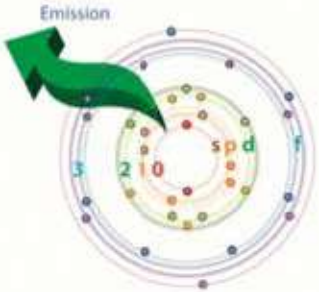
Spectral line transitions

8 un-named
7 Humphries
6 Pfund
5 Brackett
4 Paschen
3 Balmer
2 Lyman
1

Quantum level jumps



Quantum Level Jumps

Photon Absorption and Release

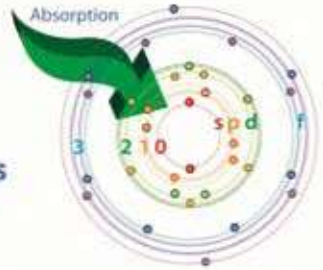


Photo-electrons can only transition between principal energy Baryons in the atomic nuclei in discrete steps [or quantum jumps] because Baryons determine the KEM energy levels of electrons in nuclei

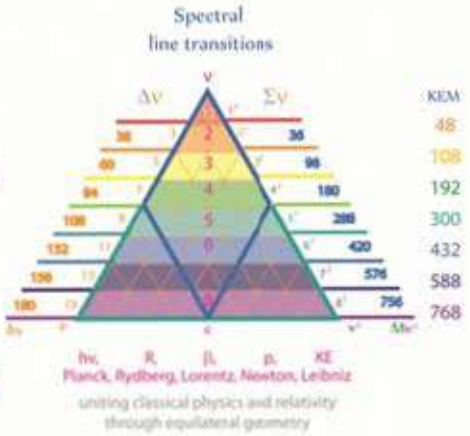
[see Tetryonic QED for full details on spectral line mechanics]

Initial Quantum level									
8	768	756	720	660	576	468	336	180	0
7	588	576	540	480	396	288	156	0	
6	432	420	384	324	240	132	0		
5	300	288	252	192	108	0			
4	192	180	144	84	0				
3	108	96	60	0					
2	48	36	0						
1	12	0							
		12	48	108	192	300	432	588	768
		1	2	3	4	5	6	7	8

Final Quantum level

$$\Delta p = \Delta M v = hf$$

accelerating photo-electrons produce spectral lines



Nuclear energy emission~absorption

If atoms are left undisturbed, their electrons usually fill the lowest available energy levels and stay there, in their "ground state."

Occasionally, however, they may also be pushed up to some higher energy ("become excited") e.g. by a collision with a fast atom or electron, one which got extra speed from an electric voltage or from some source of heat.

An atom/electron elevated to one of its higher "excited levels" soon falls back to a lower level ("undergoes a quantum jump"), emitting a photon whose energy corresponds to the difference between the levels.

That need not be the ground state: the atom/electron might descend to that state in several steps, emitting a photon at each step on the way.

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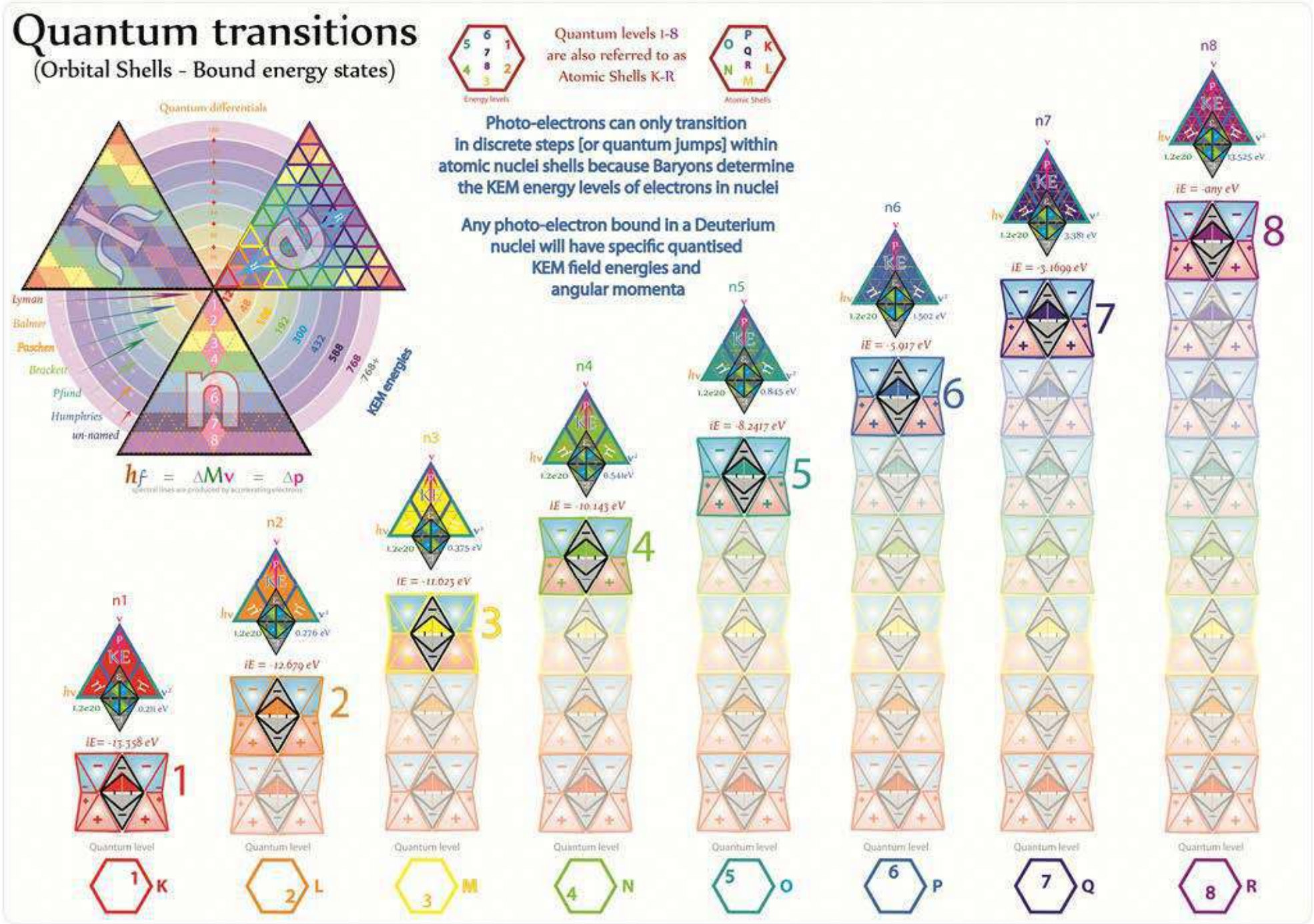

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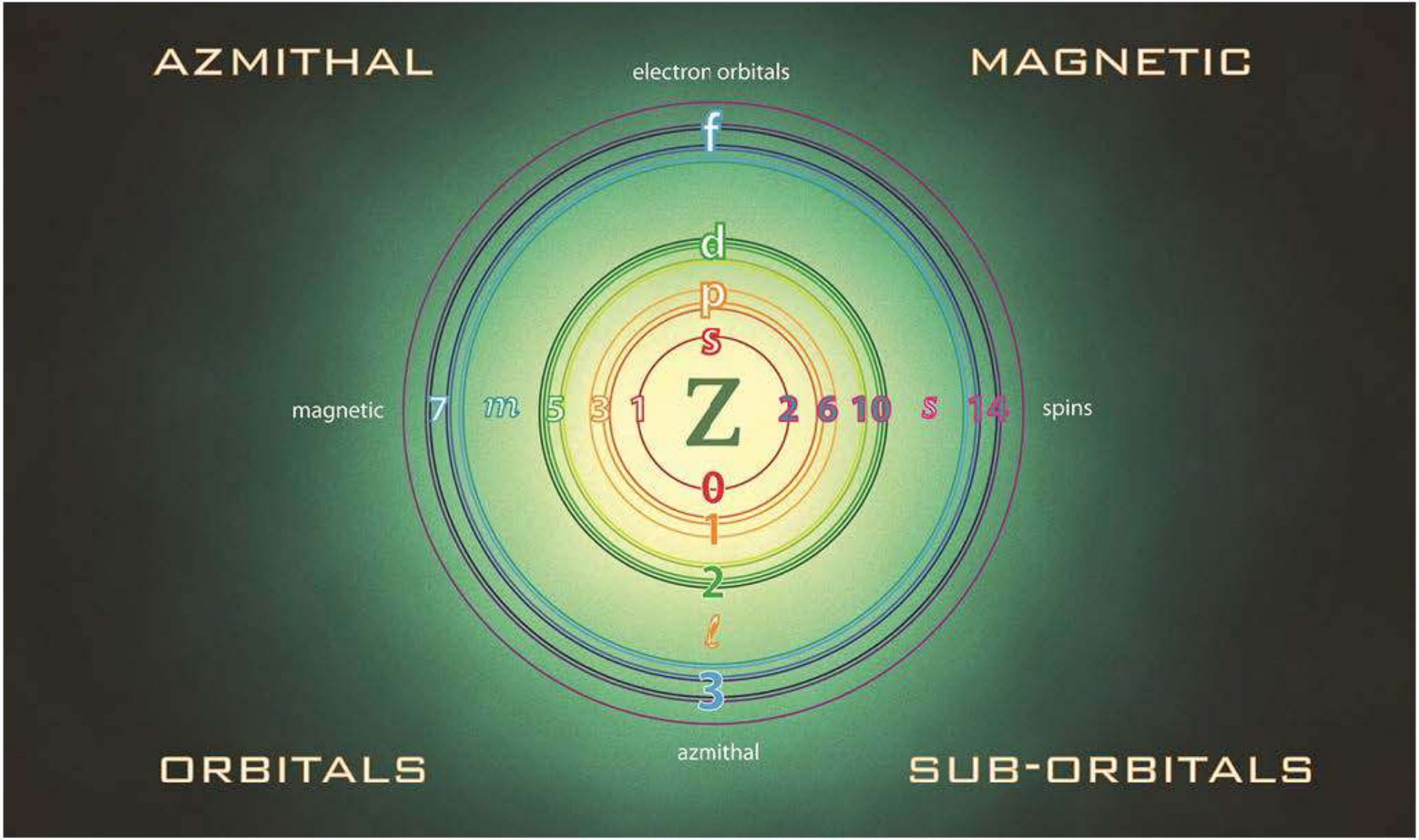

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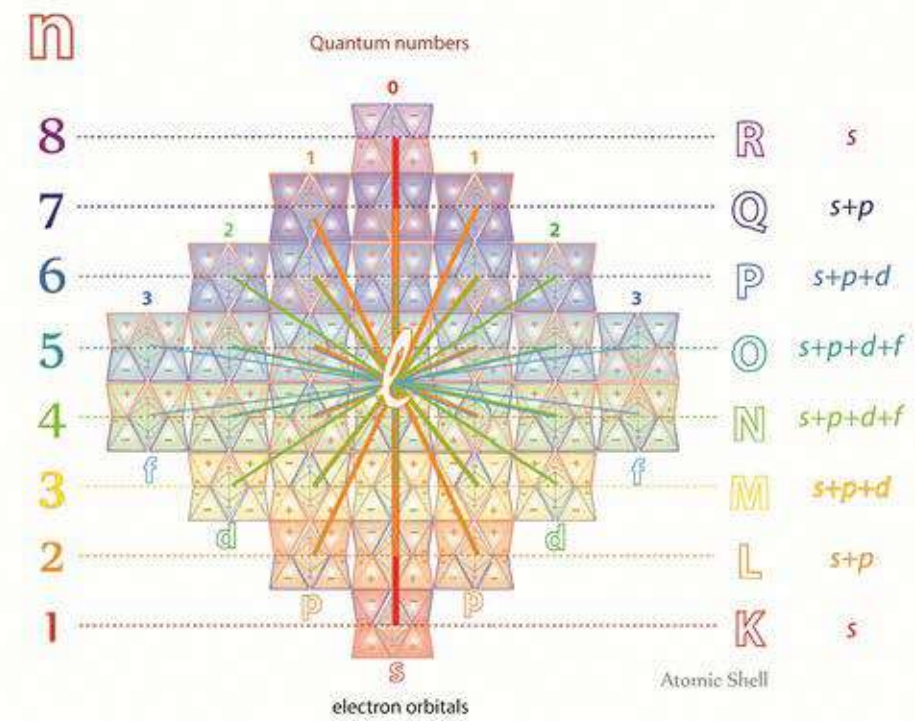
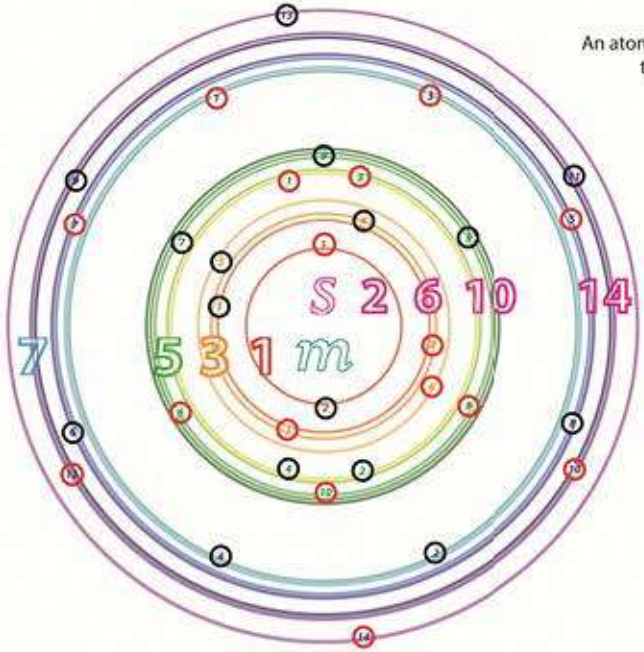
Atomic Orbitals





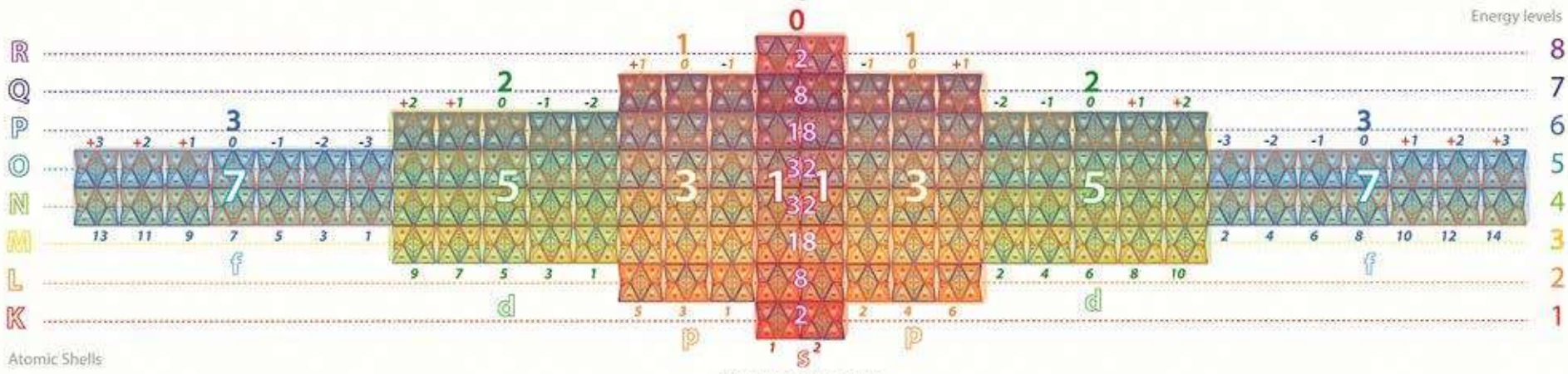
An atomic orbital is a mathematical function that describes the wave-like behavior of either one electron or a pair of electrons in an atom

Atomic orbitals are typically categorized by n, l, and m quantum numbers, which correspond to the electron's energy, angular momentum, and an angular momentum vector component, respectively.

Historically used to define the pedagogical electron cloud model of an atom Tetryonics reveals the true geometry of atomic nuclei

Each orbital is defined by a different set of quantum numbers and contains a maximum of two spin opposed electrons.

Aufbau



Electron Spins can be either up or down providing they obey the Pauli exclusion principle

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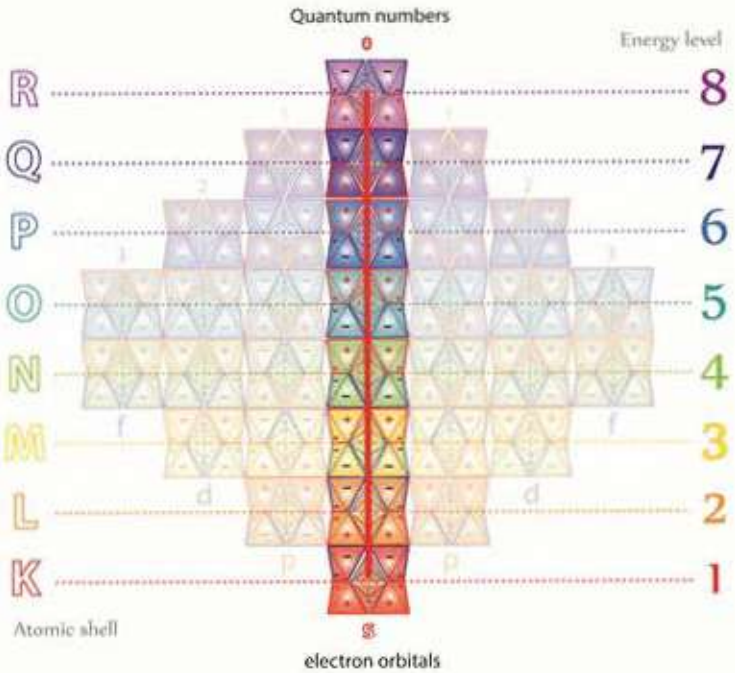
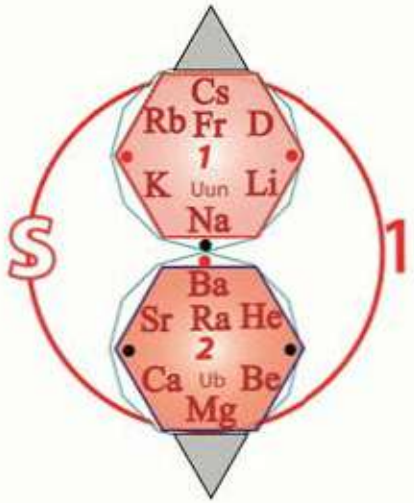
s Orbital

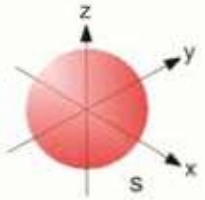
1 Orbit (2 electrons max)



		n
azmithal number	0	ℓ
magnetic numbers	0	m
spins	-1/2 +1/2	s

Alkali Metals & Alkali Earths





erroneous computer model of 's' electron orbitals

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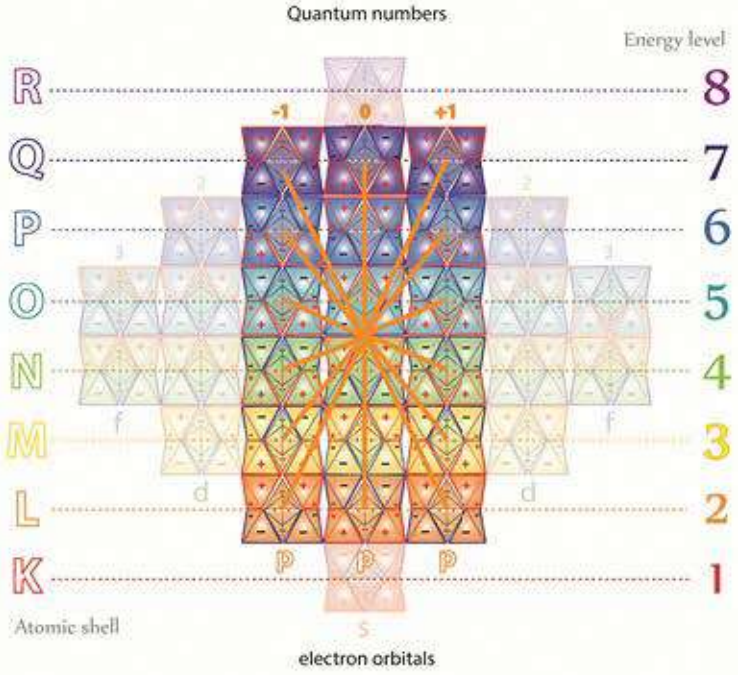
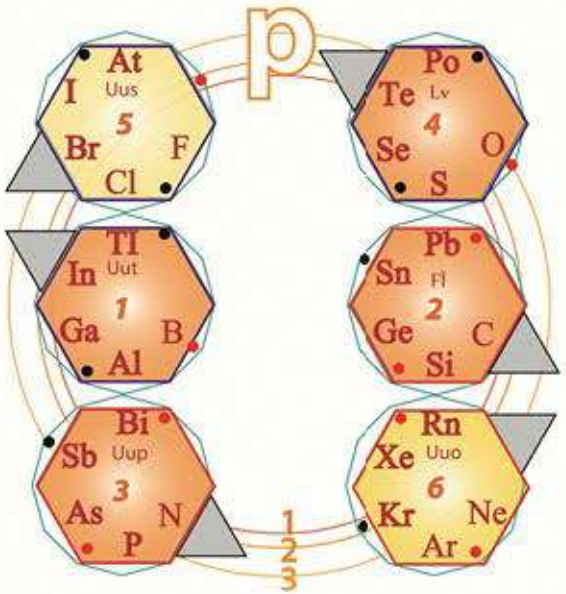
p Orbital

3 Orbits (6 electrons max)

Non-Metals, Halogens & Nobel gases





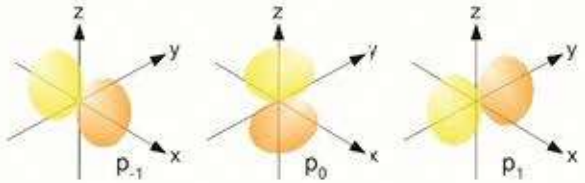
azmithal number	1		
magnetic numbers	-1	0	+1
spins	-1/2	-1/2	-1/2
	+1/2	+1/2	+1/2

n

ℓ

m

s



erroneous computer model of 'p' electron orbitals

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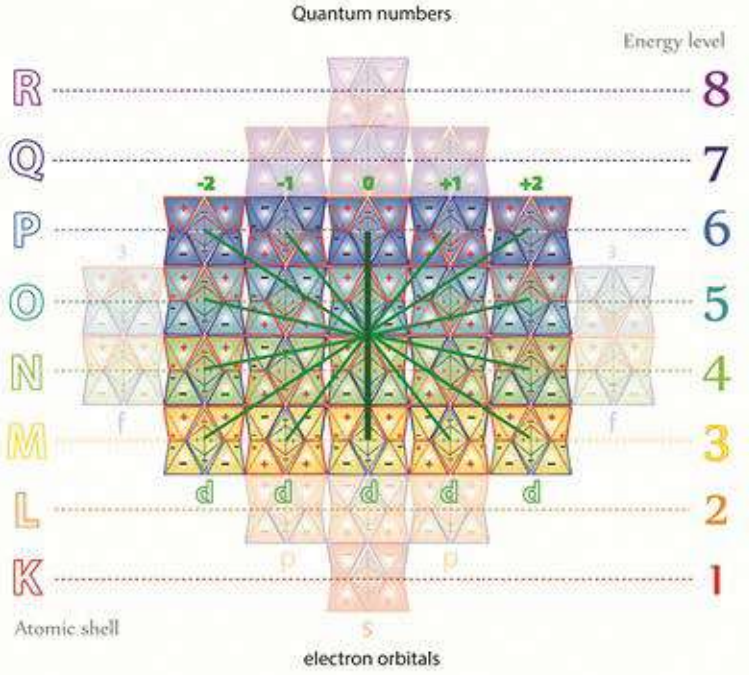
d Orbital

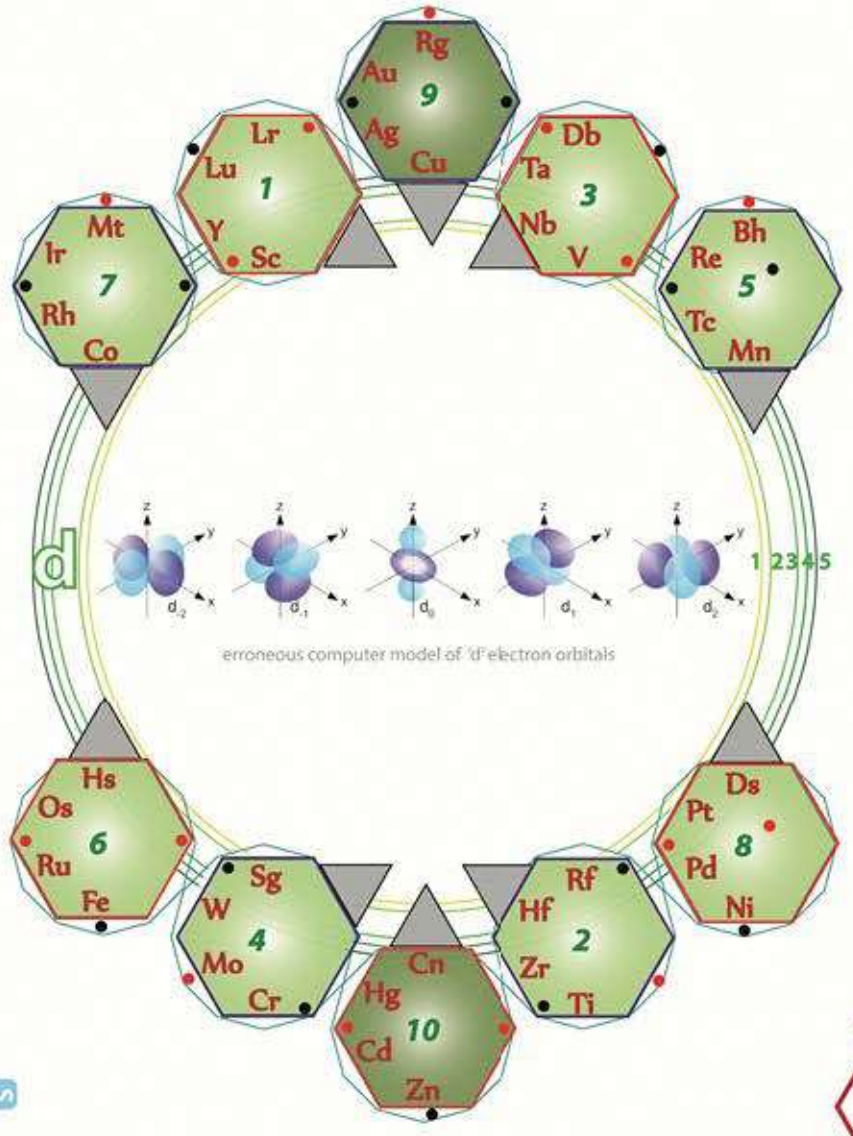
5 Orbits (10 electrons max)



azmithal number			2			ℓ
magnetic numbers	-2	-1	0	+1	+2	m
spins	-1/2	-1/2	-1/2	-1/2	-1/2	s
	+1/2	+1/2	+1/2	+1/2	+1/2	

n

Transition & post-Transition Metals



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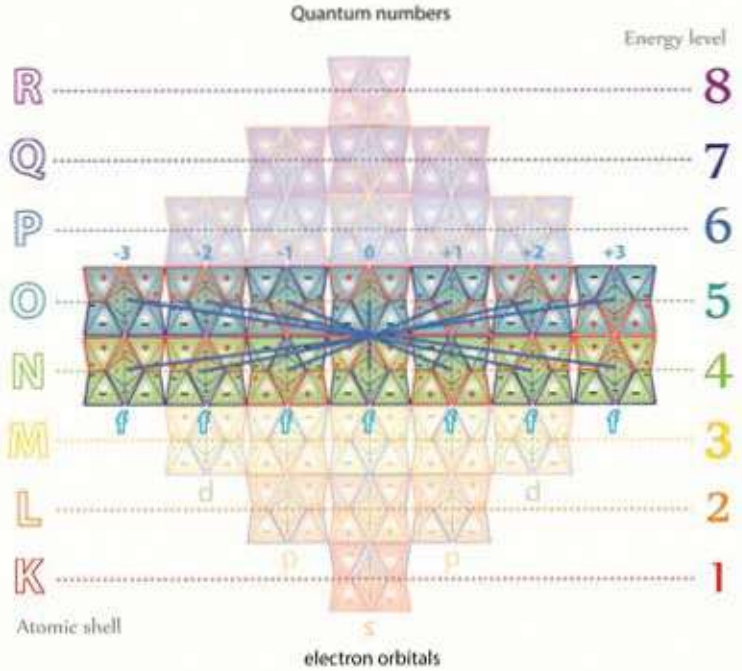
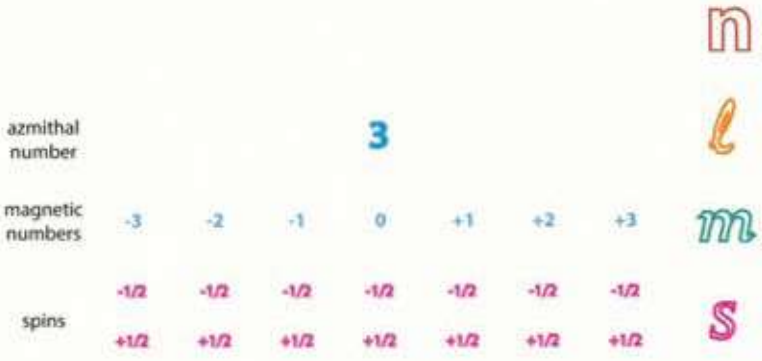
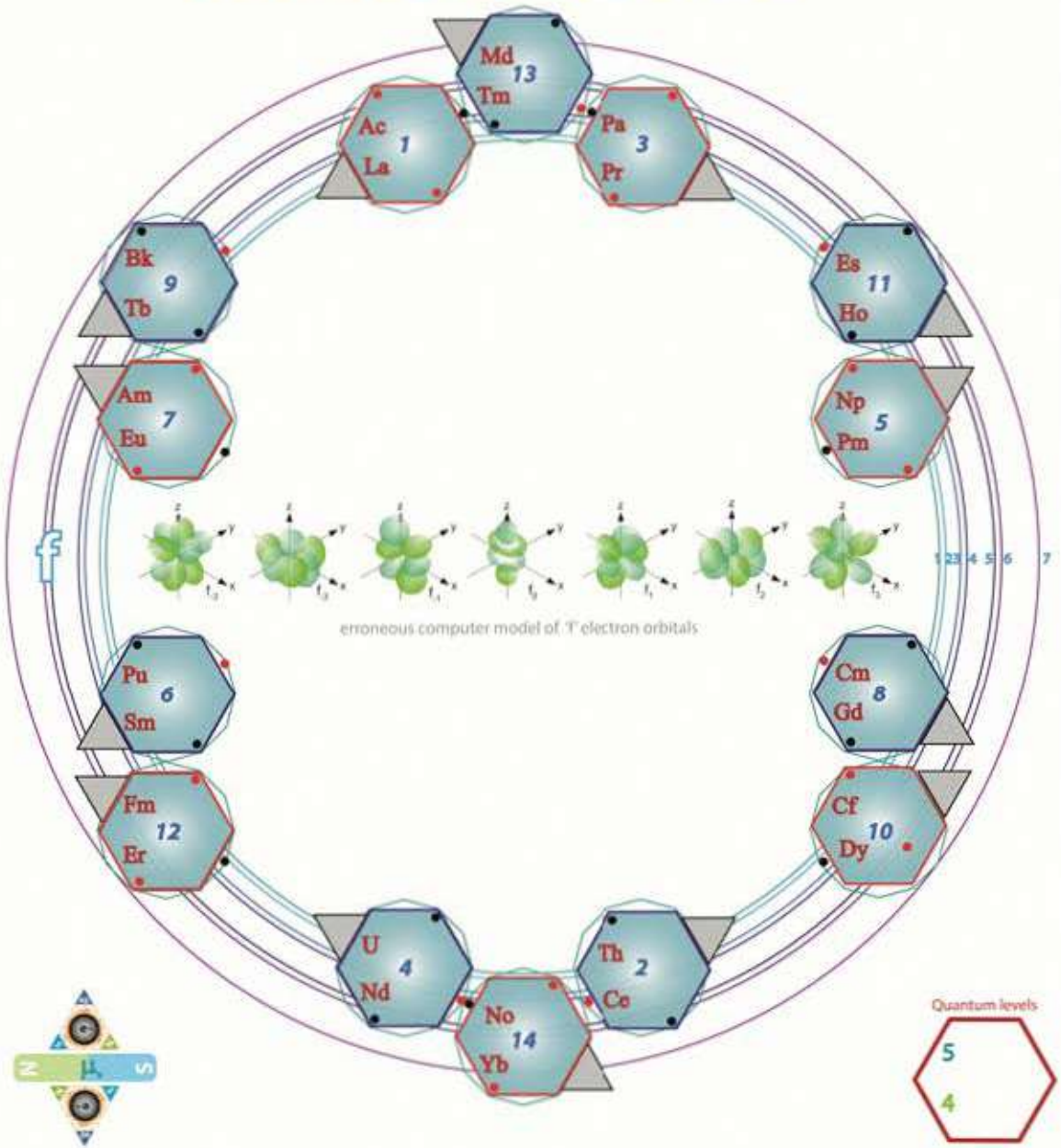
f Orbital

7 Orbits (14 electrons max)





Lanthanoids & Actinoids



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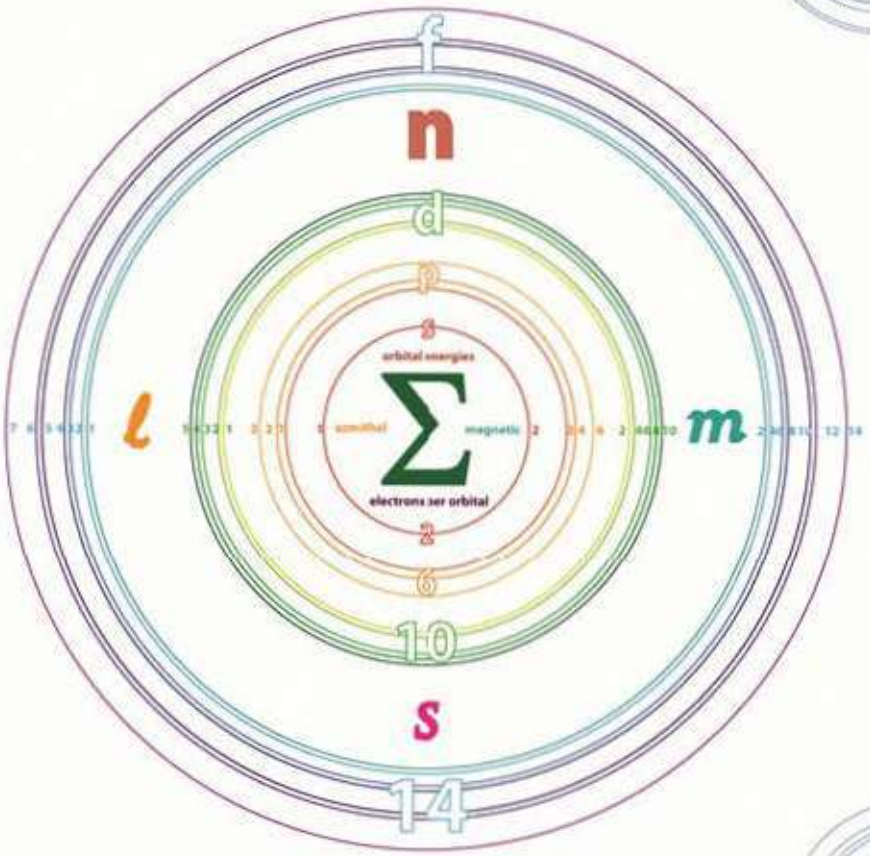
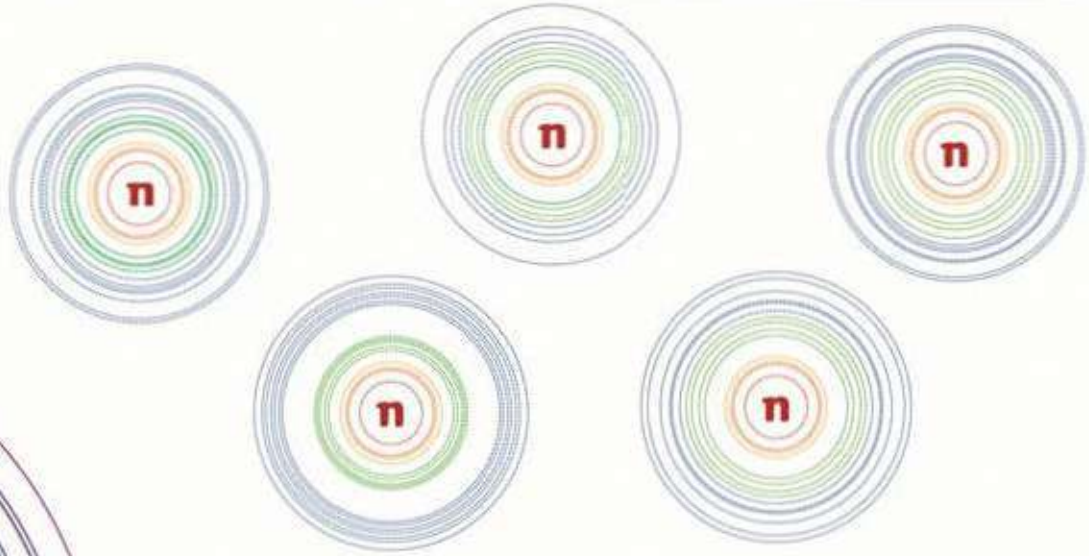
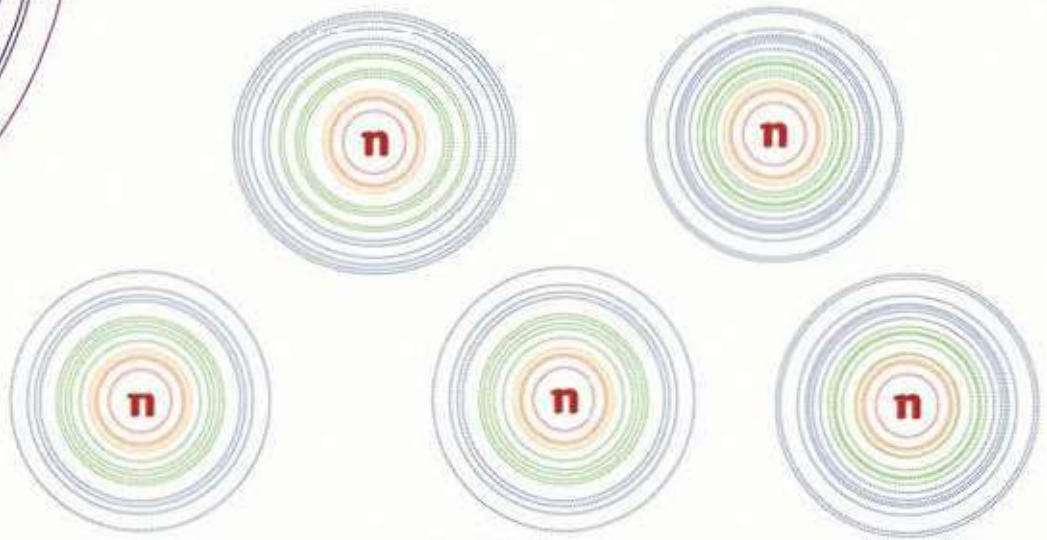
Orbital energy variations

All Elements have stable core electron configurations of s & p orbitals for each energy level as revealed through diffraction studies





As additional nuclei bind to form d & f orbitals they can do so by bonding in many positions, with each location producing different orbital energies for each electron that binds to nuclei in that position



The final energy levels of each orbital is the result of the energy of the Baryons in the nuclei and the spin coupling energies of the photo-electrons bound to them

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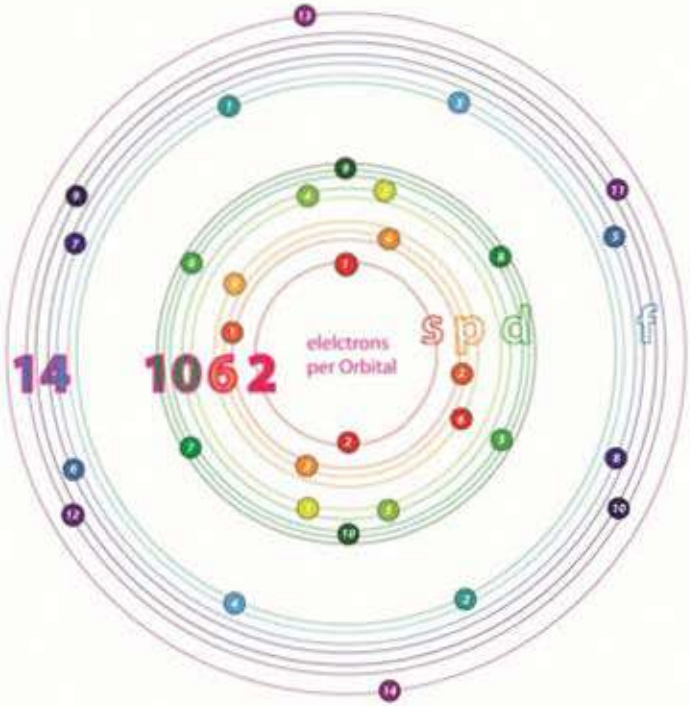
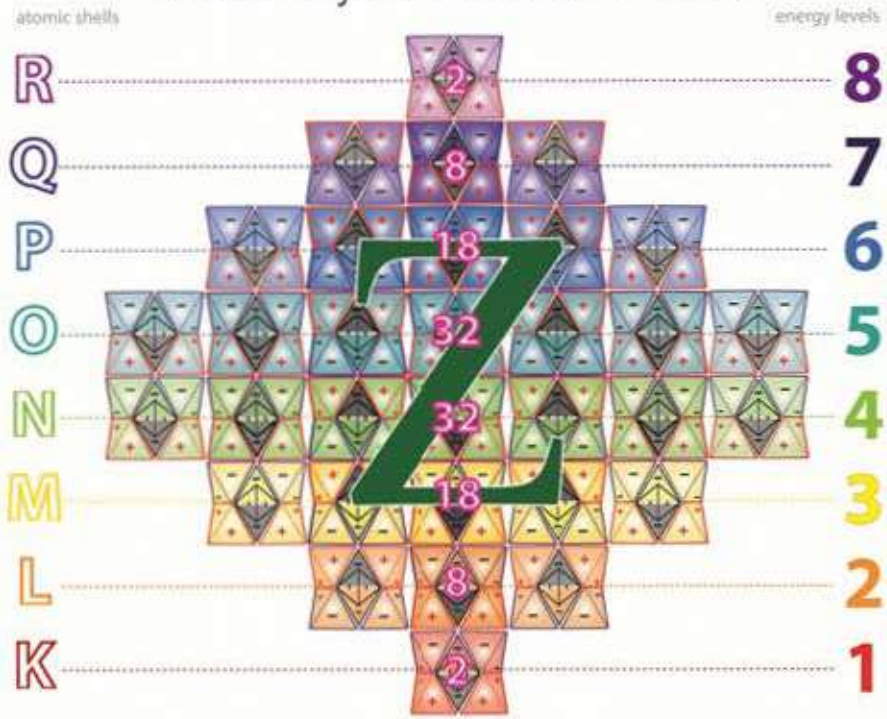
Electrons per shell



Each energy shell of a periodic element can hold only a fixed number of electrons



Atomic Orbitals

f	d	p	s	p	d	f
5, 11, 3, 13, 1, 9, 7	8, 2, 10, 4, 6	5, 1, 3	1-2	6, 2, 4	7, 1, 9, 3, 5	6, 12, 4, 14, 2, 10, 8

7 + 5 + 3 + 2 + 3 + 5 + 7

Rules governing the allowed combinations of Quantum Numbers

The three quantum numbers (n, l, and m) that describe an orbital are integers: 0, 1, 2, 3, and so on

n (1-8) Principal	The principal quantum number (n) cannot be zero.
ℓ (0-3) Azimuthal	The angular quantum number (l) can be any integer between 0 and n - 1.
$m\ell\ (2\ell+1)$ Magnetic	The magnetic quantum number (m) can be any integer between -l and +l.
$m_s \pm \frac{1}{2}$ Spin Projection	The Spin of electrons in any nuclear sub-orbital can only be +1/2 (Spin UP) or -1/2 (Spin DOWN).

Z

1, 2, 3, 4, 5, 6, 7, 8

s, p, d, f

1	2
1, 3, 5	2, 4, 6
1, 3, 5, 7, 9	2, 4, 6, 8, 10
1, 3, 5, 7, 9, 11, 13	2, 4, 6, 8, 10, 12, 14
down up	up down

Quantum Numbers

n	4-5	3-6	2-7	1-8	2-7	3-6	4-5
ℓ	3	2	1	0	1	2	3
m	-3	-2	-1	1	+1	+2	+3
s	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2

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Using Tetryonic charged geometries for mass-ENERGY-Matter,
an electron's position and velocity CAN be modelled simultaneously
(but any attempt to measure or interact with it, will affect its component energy-momenta)

Electron Position Uncertainty

Atomic orbitals are typically described as "hydrogen-like" (meaning one-electron) wave functions over any spatial region of measurement, categorized by n, l, and m quantum numbers, which correspond to the electron's energy, angular momentum, and a vector momentum component, respectively

Erwin Schrödinger

(12 August 1887 – 4 January 1961)

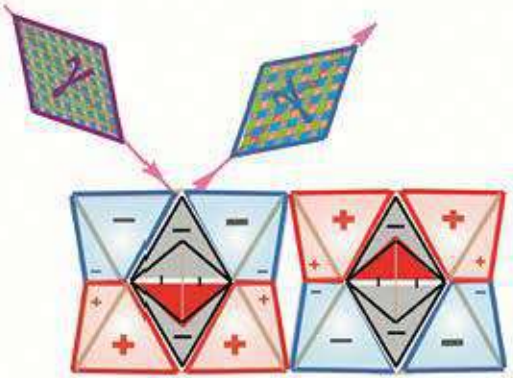
Werner Heisenberg

(5 December 1901 – 1 February 1976)

Lepton's are physically Spin 1 fermion particles that can easily be misconstrued as having entirely different spin numbers without the correct physical topologies to base the observed measurements on

Quantum Mechanics is a mathematical representation of equilateral energy momenta interactions and the charged geometries of mass-ENERGY-Matter

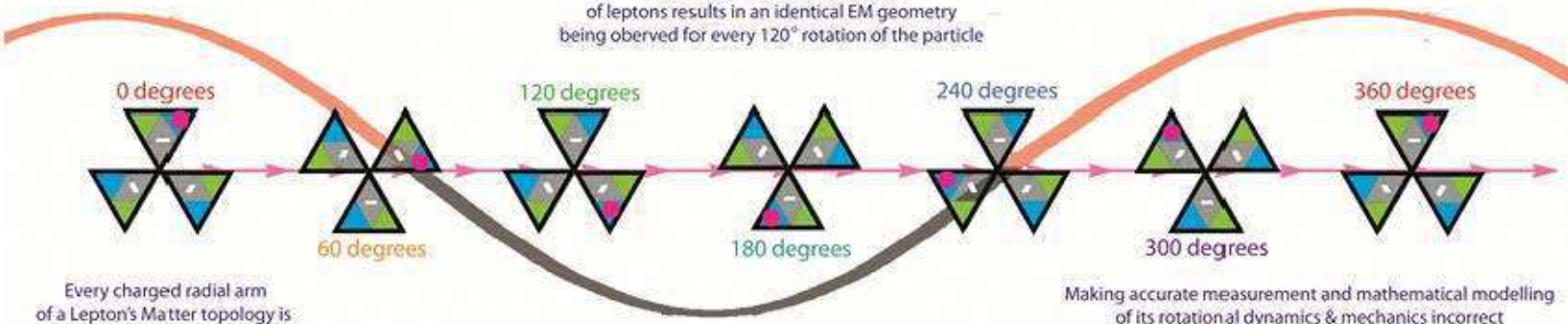
Determining the motion of electrons bound to atomic nuclei is akin to measuring the motion of variable speed electric fan blades mounted at various heights within a rotating carousel



The energies of photo-electrons are determined by the Baryons they bind to & incident photons

Leptons are 12 loop quantum rotors

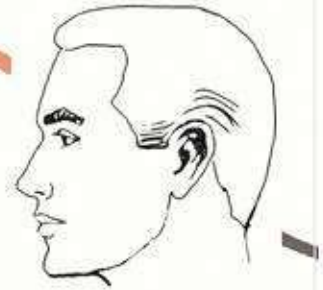
The unique 12 faceted topology
of leptons results in an identical EM geometry
being oberved for every 120° rotation of the particle



Every charged radial arm
of a Lepton's Matter topology is
identical to every other

Making accurate measurement and mathematical modelling
of its rotational dynamics & mechanics incorrect
without the correct physical topologies

Leading to the interpretation that
the Lepton disappears and re-appears
when being 'observed' or measured



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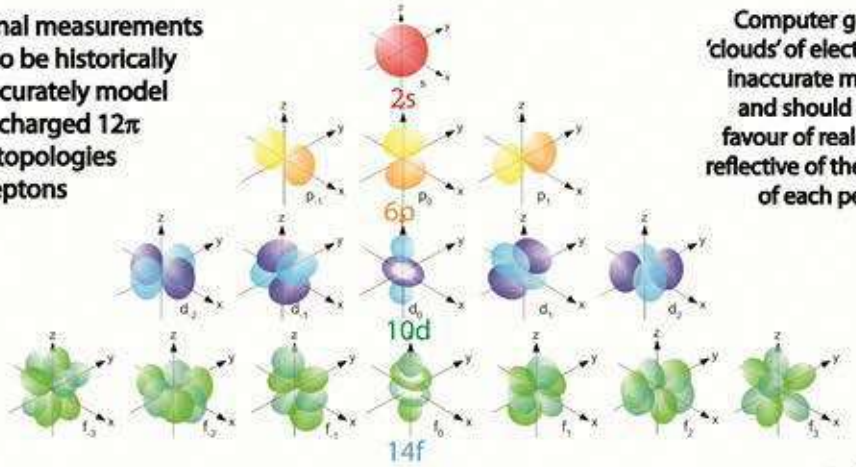
Electron modelling & probability calculations

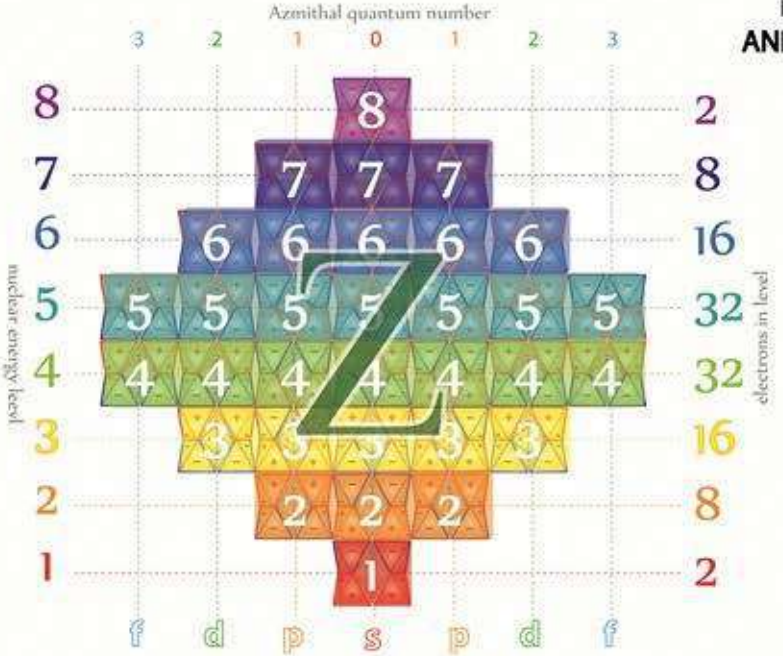
Electron positional measurements have proven to be historically difficult to accurately model due to the charged 12π rotating topologies of leptons



Computer generated plots of 'clouds' of electron probabilites are inaccurate mis-representations and should be abandoned in favour of realistic atomic models reflective of the charged geometry of each periodic element

Every elemental atom can be viewed as a quantum carousel with a unique number of oscillating fans positioned around it.

Each fan has 3 blades and a fixed speed n[1-8] related to its height above ground level, AND the carousel is turning around on its axis



All periodic elements are made form Deuterium nuclei

The baryonic energies of nuclei determines the energies of bound photo-electrons

The current computer generated electron probability diagrams in popular use at present can now be show to be a misrepresentative model of mathematical modelling of electron sub-orbital energies

The nuclear quantum levels [n], intrinsic quantised angular momentum [h] and orbital angular momentum [l] of each electron bound within atomic nuclei are all the direct result of the Baryonic energies of the nuclei they are bound to

Each level of the quantum carousel can contain only a limited number of fans each running at a specific speed

Imagine trying to measure (or model) the motion of any 1 quantum scale blade while the carousel rotates

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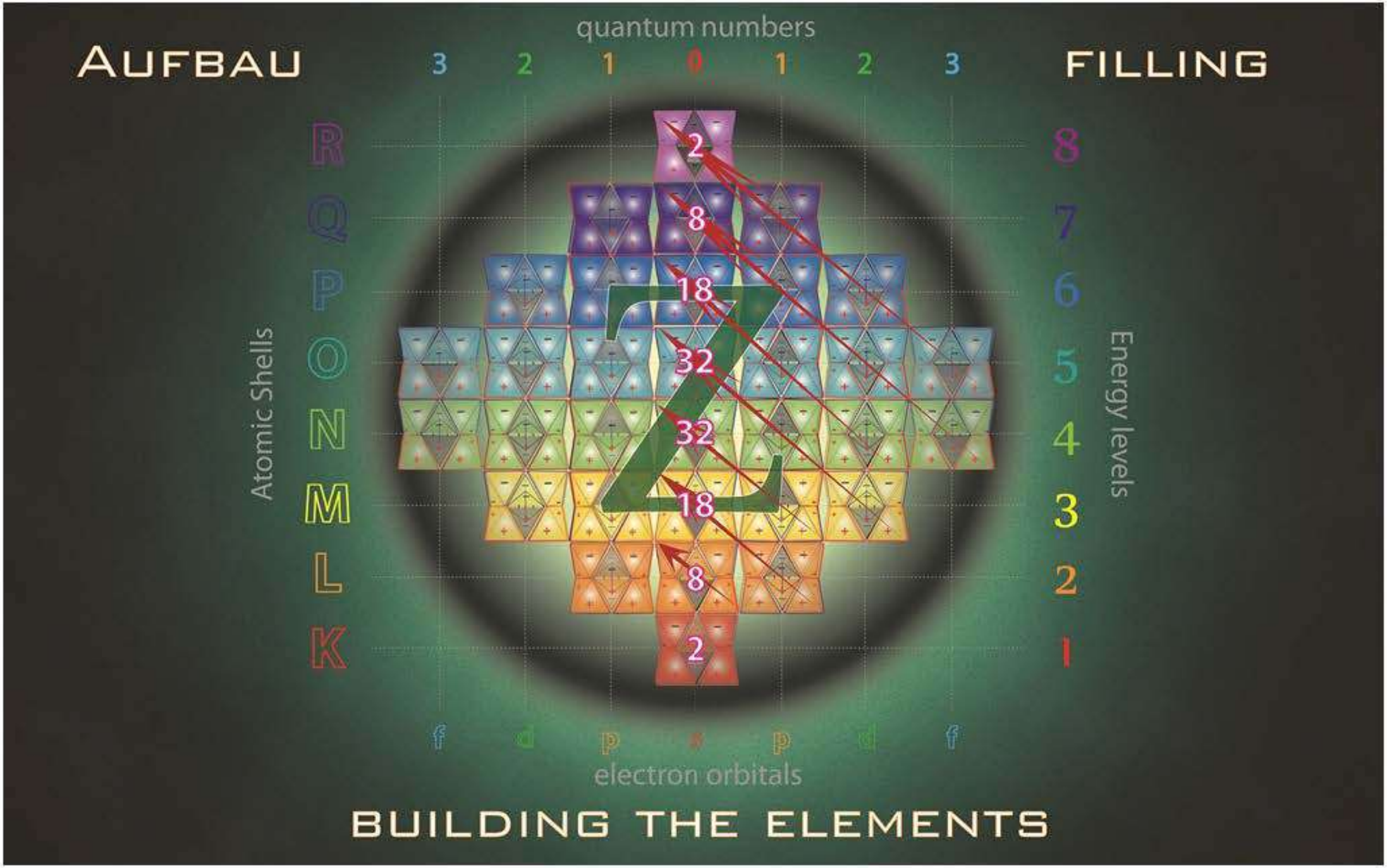

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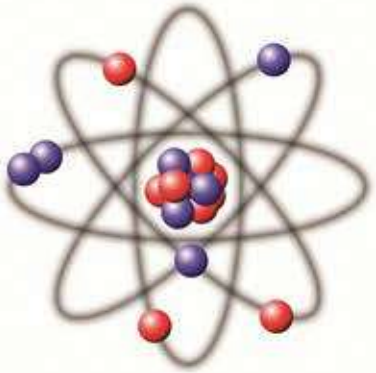
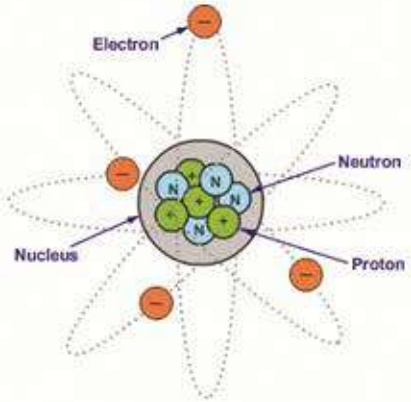
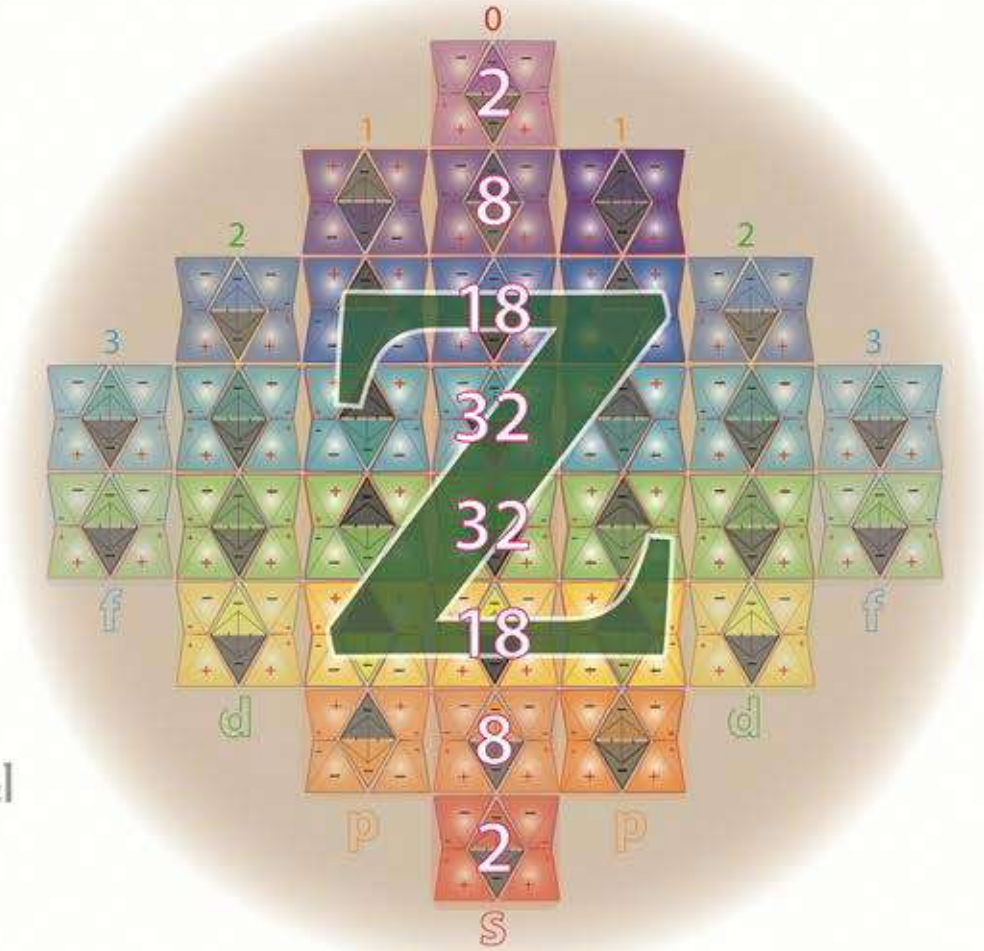
Quantum Topologies





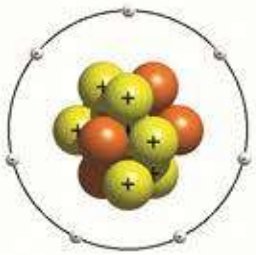
Dalton Model

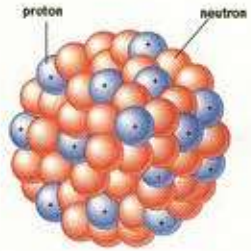


Quantum Model

Thomson Model

Rutherford Model





Historically viewed as a spherical object
Tetryonic charge geometry has finally revealed the
true quantum topology of all atoms

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Element numbers

The rule dictating how many nuclei form each Atomic shell is known as the Aufbau principle.

The physical and chemical properties of elements is determined by the atomic structure. The atomic structure is, in turn, detemined by the electrons and which shells, subshells and orbitals they reside in.

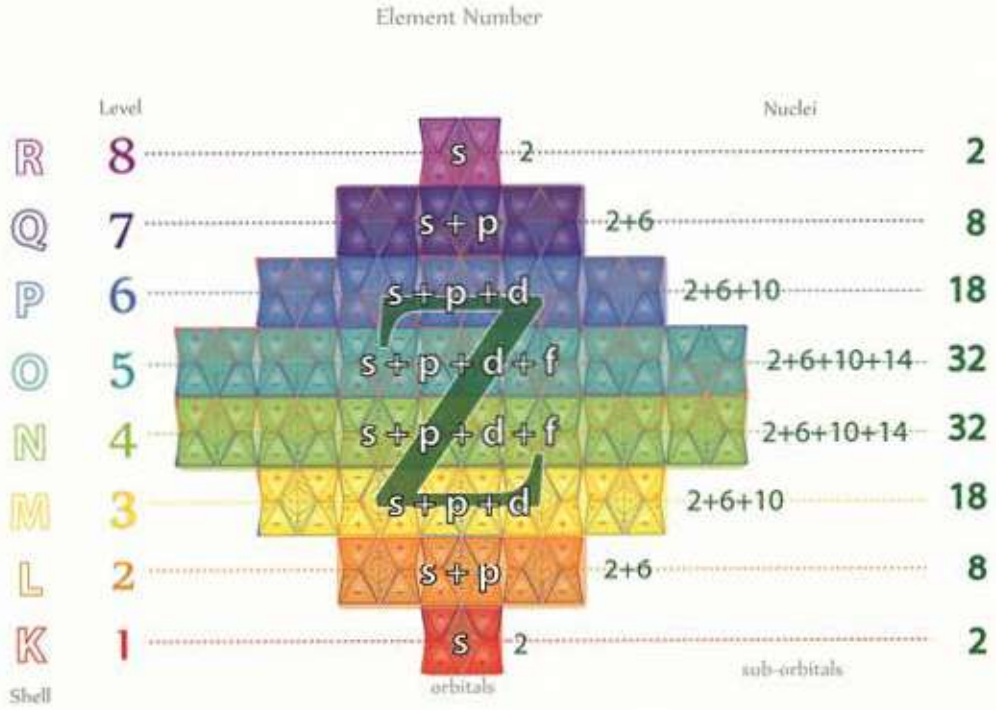
The maximum periodic elemental number is 120

$$Z = \sum_{1}^{1\,2\,3\,4\,4\,3\,2\,1} 2(n^2) = 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2$$

Number of nuclei per level	Element #
2	120
+	119
8	118
+	111
18	110
+	93
32	92
+	61
32	60
+	29
18	28
+	11
8	10
+	3
2	2
	1

The number of nuclei per quantum level is reflective of photonic energy levels and provides the foundational geometry for all of the periodic elements

The number of possible nuclei in each Quantum level follows aufbau principle 'numbers' which can be determined using the following summation formula


Element Number
Level
Nuclei
R 8 s 2 2
Q 7 s + p 2+6 8
P 6 s + p + d 2+6+10 18
O 5 s + p + d + f 2+6+10+14 32
N 4 s + p + d + f 2+6+10+14 32
M 3 s + p + d 2+6+10 18
L 2 s + p 2+6 8
K 1 s 2 2
Shell
orbitals
sub-orbitals

Deuterium is the building block of all elements

Each element has equal numbers of Protons, electron & Neutrons with their stored mass-energies making up the molar masses of elements not excess neutron as currently modelled

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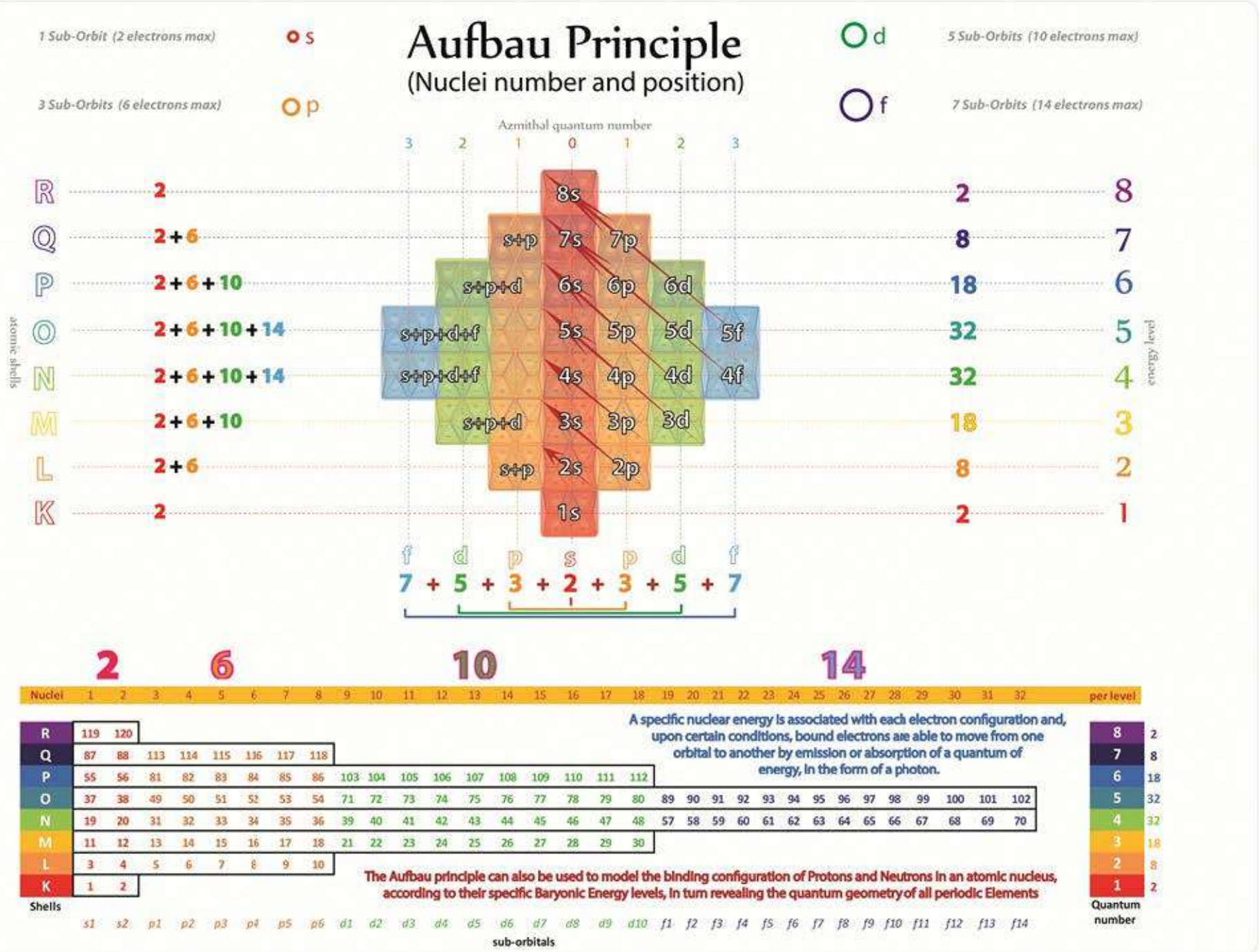
Aufbau Principle
(Nuclei number and position)
1 Sub-Orbit (2 electrons max)
s
3 Sub-Orbits (6 electrons max)
p
d
5 Sub-Orbits (10 electrons max)
f
7 Sub-Orbits (14 electrons max)
Azmithal quantum number
3 2 1 0 1 2 3
R 2
Q 2+6
P 2+6+10
O 2+6+10+14
N 2+6+10+14
M 2+6+10
L 2+6
K 2
atomic shells
8s
s+p 7s 7p
s+p+d 6s 6p 6d
s+p+d+f 5s 5p 5d 5f
s+p+d+f 4s 4p 4d 4f
s+p+d 3s 3p 3d
s+p 2s 2p
1s
2 8
8 7
18 6
32 5
32 4
18 3
8 2
2 1
energy level
f d p s p d f
7 + 5 + 3 + 2 + 3 + 5 + 7
2 6 10 14
Nuclei 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 per level
R 119 120
Q 87 88 113 114 115 116 117 118
P 55 56 81 82 83 84 85 86 103 104 105 106 107 108 109 110 111 112
O 37 38 49 50 51 52 53 54 71 72 73 74 75 76 77 78 79 80 89 90 91 92 93 94 95 96 97 98 99 100 101 102
N 19 20 31 32 33 34 35 36 39 40 41 42 43 44 45 46 47 48 57 58 59 60 61 62 63 64 65 66 67 68 69 70
M 11 12 13 14 15 16 17 18 21 22 23 24 25 26 27 28 29 30
L 3 4 5 6 7 8 9 10
K 1 2
Shells
s1 s2 p1 p2 p3 p4 p5 p6 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 f1 f2 f3 f4 f5 f6 f7 f8 f9 f10 f11 f12 f13 f14
sub-orbitals
A specific nuclear energy is associated with each electron configuration and, upon certain conditions, bound electrons are able to move from one orbital to another by emission or absorption of a quantum of energy, in the form of a photon.
The Aufbau principle can also be used to model the binding configuration of Protons and Neutrons in an atomic nucleus, according to their specific Baryonic Energy levels, in turn revealing the quantum geometry of all periodic Elements
8 2
7 8
6 18
5 32
4 32
3 18
2 8
1 2
Quantum number

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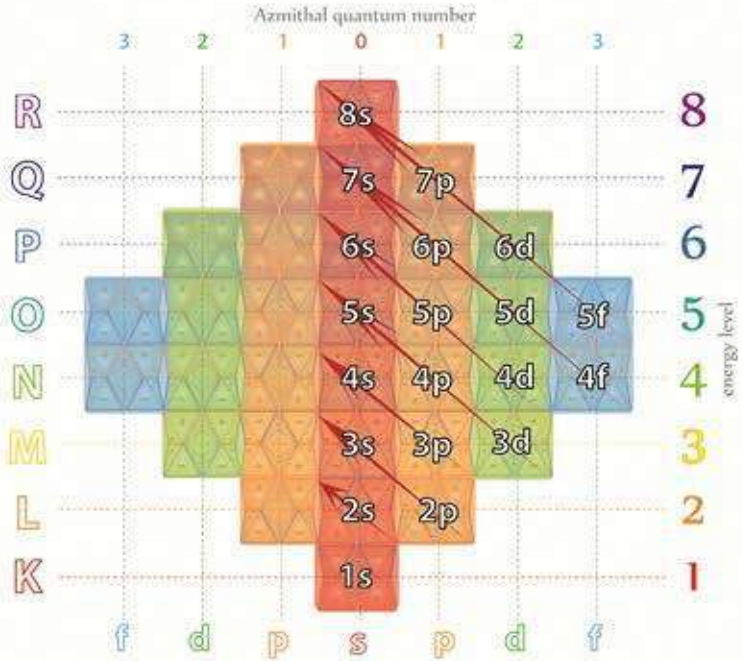
Wolfgang Pauli

(25 April 1900 – 15 December 1958)



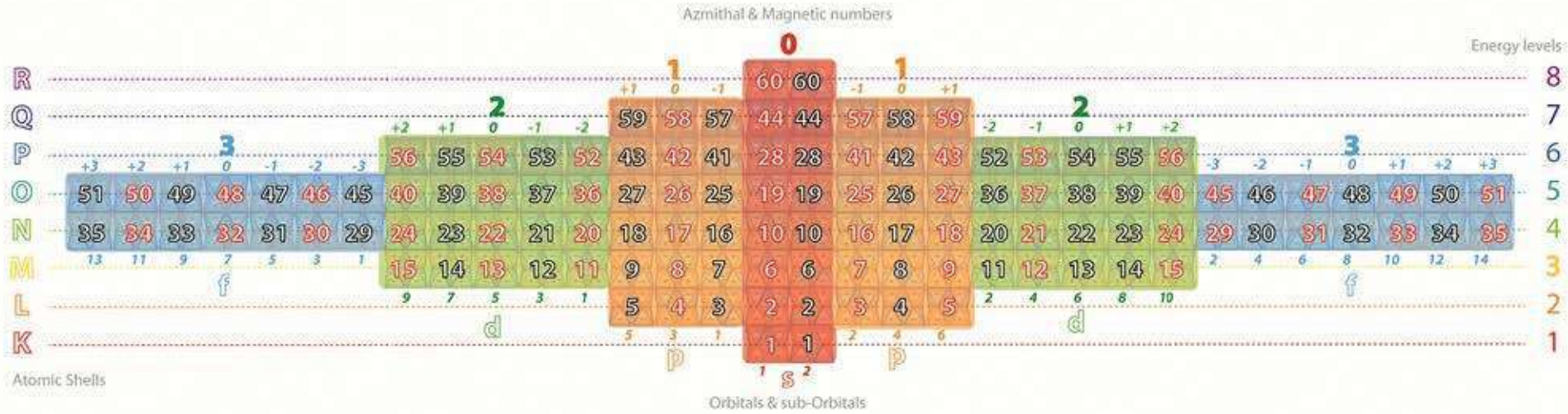
Friedrich Hermann Hund

(4 February 1896 - 31 March 1997)

The orbitals of lower energy are filled in first with the electrons and only then are the higher energy orbitals filled.

aufbau electron orbital filling

Orbitals of equal energy are each occupied by one electron before any orbital is occupied by a second electron, and all electrons in singly occupied orbitals must have the same spin state



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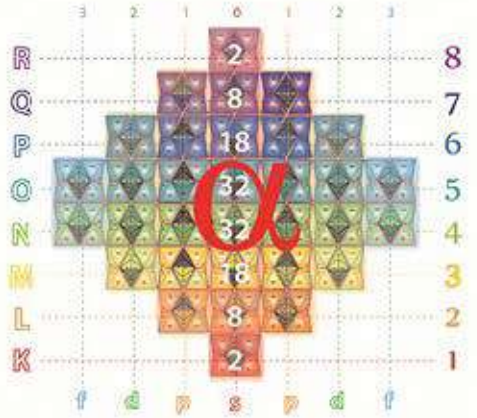
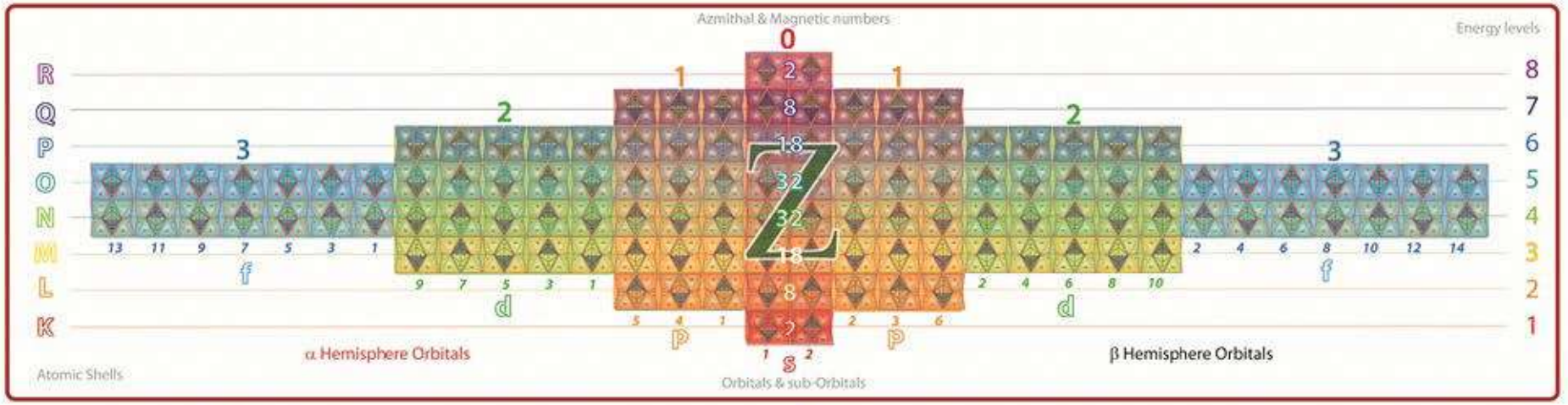
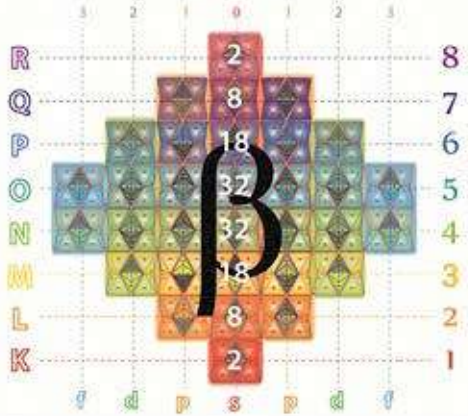
Aufbau construction

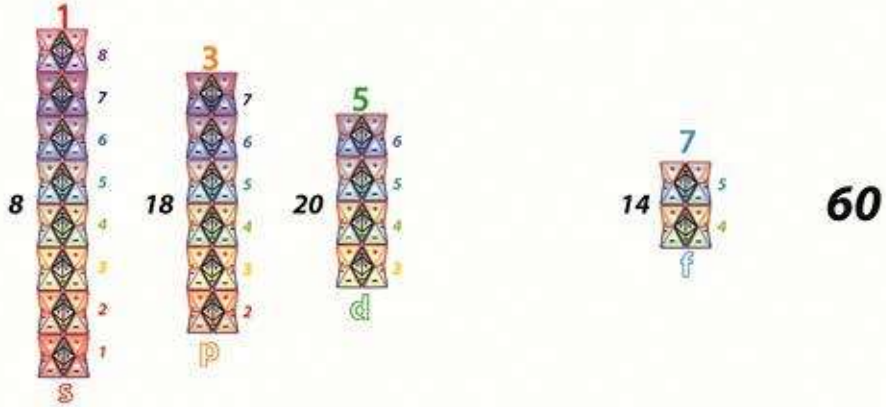
Proton base Hemisphere







Neutron base Hemisphere



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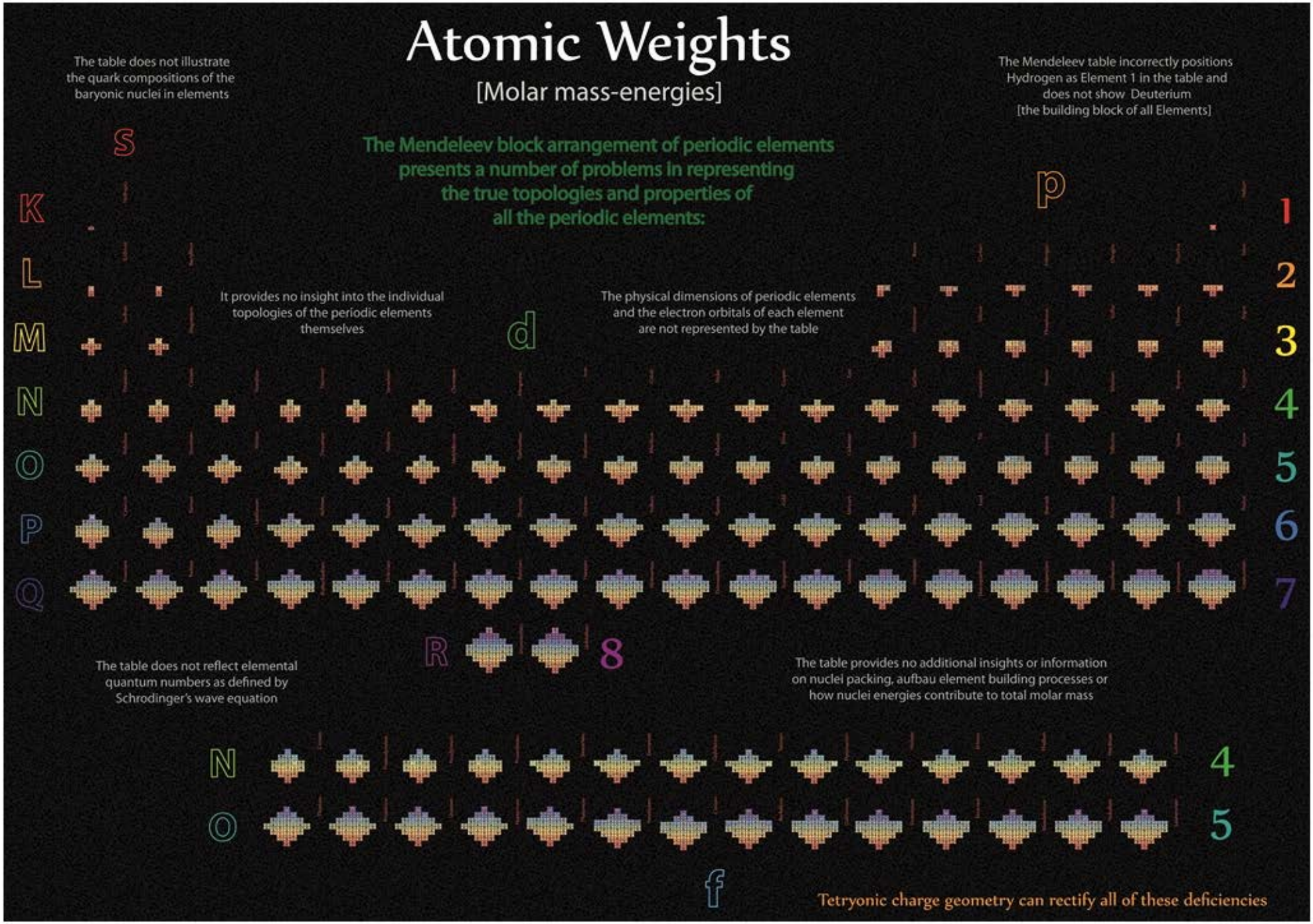
Atomic Weights
[Molar mass-energies]
The table does not illustrate the quark compositions of the baryonic nuclei in elements
The Mendeleev table incorrectly positions Hydrogen as Element 1 in the table and does not show Deuterium [the building block of all Elements]
The Mendeleev block arrangement of periodic elements presents a number of problems in representing the true topologies and properties of all the periodic elements:
It provides no insight into the individual topologies of the periodic elements themselves
The physical dimensions of periodic elements and the electron orbitals of each element are not represented by the table
The table does not reflect elemental quantum numbers as defined by Schrodinger's wave equation
The table provides no additional insights or information on nuclei packing, aufbau element building processes or how nuclei energies contribute to total molar mass
Tetryonic charge geometry can rectify all of these deficiencies

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Baryon mass-energies

n

E

The quantum level mass-energies of Baryons determines the kinetic energies of electrons

1n - 1 e19v

electron KEM field

hv^2

73,728	n32	v8	3.268969693 e15
69,192	n31	v7	2.502804921 e15
64,800	n30	v6	1.838795452 e15
60,552	n29	v5	1.276941286 e15
56,448	n28	v4	8.172424232 e14
52,488	n27	v3	4.596988631 e14
48,672	n26	v2	2.043106058 e14
45,000	n25	v1	5.107765145 e13

Compton frequencies

930 MeV

1.2 e20 electron rest Matter is velocity invariant

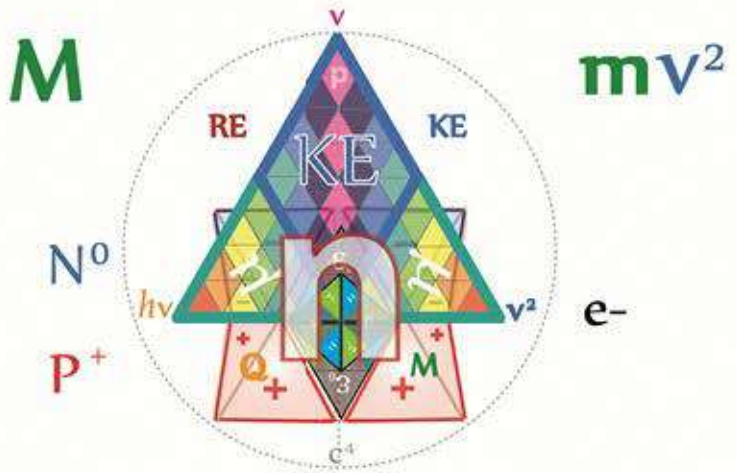
496 keV

spectral frequencies

13.6 eV

Atomic nuclei mass-energies

Each element's weight [mass-Matter in a gravitational field] is the result of the total quanta comprising that element



The nuclei forming each atomic shell have specific mass-energy quanta

$$\sum_{1}^{8} n \left[[72(n)^2] + [12e19] + [m_e v^2] \right]$$

Baryon rest masses — lepton rest mass — KEM

Deuterium mass-energy per shell

Despite having differing mass-energies each Deuterium nuclei has the same velocity invariant Matter geometry [84π]

spin orbital coupling in synchronous quantum convertors

Electrons act as quantum scale rotating armatures in atomic nuclei and can only have specific energies reflective of the electron orbital energy level of the Baryons in which they are found

They acheive these energy levels by absorbing or emitting photons to acheive the specific angular momentum required

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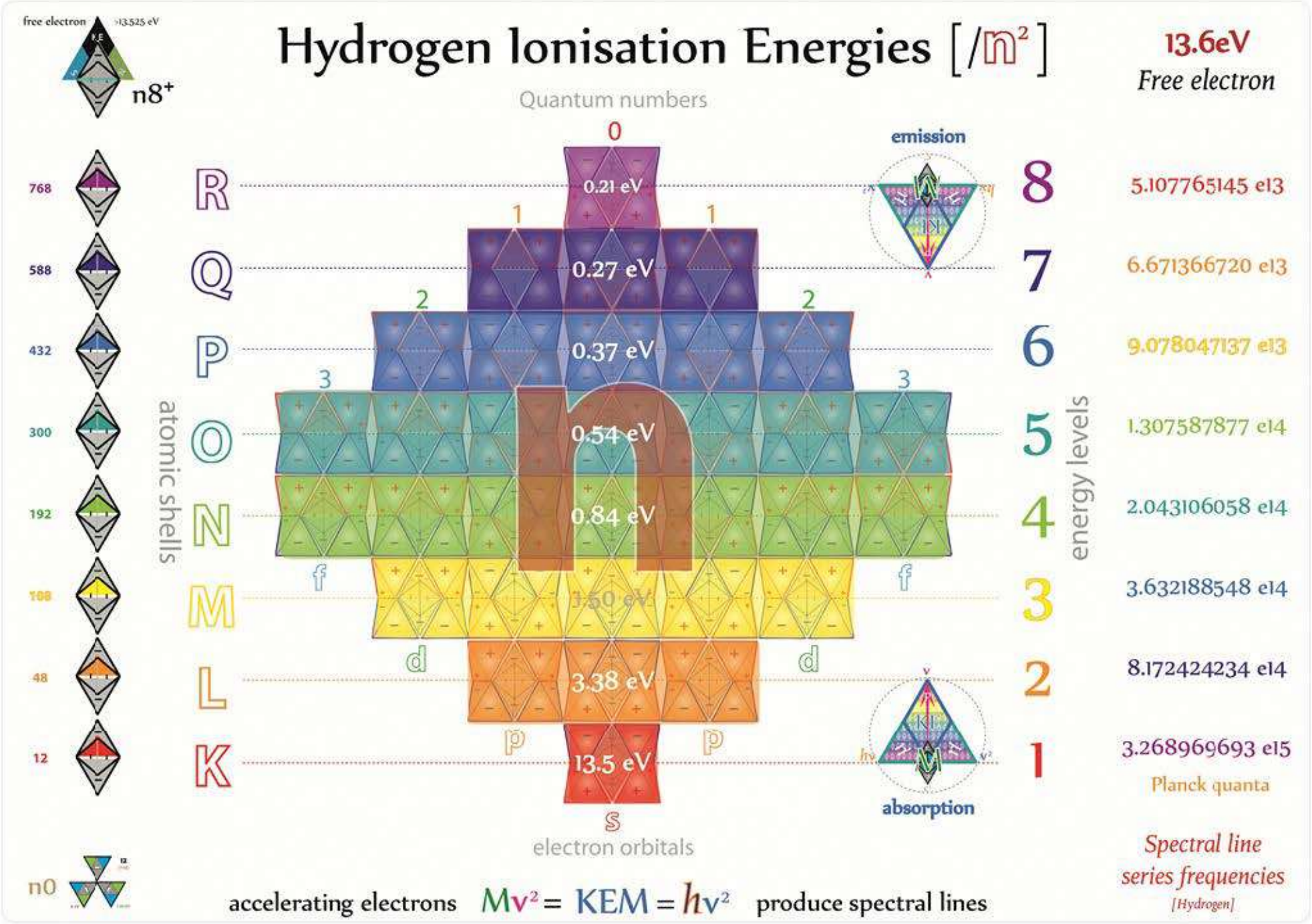

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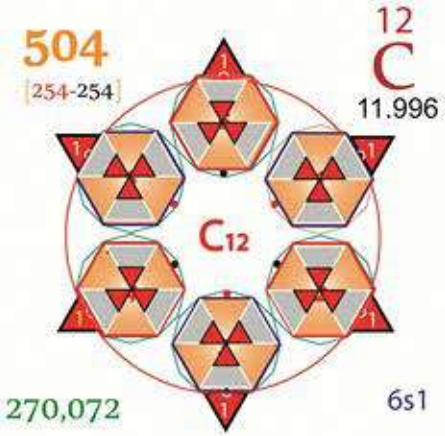
Redefining Atomic weights

Atomic weight (symbol: Ar) is a dimensionless physical quantity, the ratio of the average mass of atoms of an element (from a given source) to 1/12 of the mass of an atom of carbon-12 (known as the unified atomic mass unit)

Carbon 12



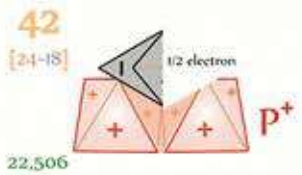
The 'unified atomic mass unit' currently in use is known to be inaccurate and must be corrected in order to bring clarity & increased accuracy to the atomic weights of all elements

$A_r = 22{,}512$ Hydrogen

Defining Hydrogen as having an exact atomic Planck mass of 22512n quanta provides uniformity with Tetryonics

1/12 C_{12}

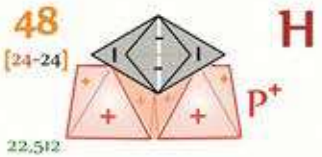
$A_r = 22{,}506$



1.660096209e-27 kg

1 Proton [24-12]
.5 electron 0-6
n1

Unified atomic Matter unit



1.660538783e-27 kg

1 Proton [24-12]
1 electron [0-12]
n1

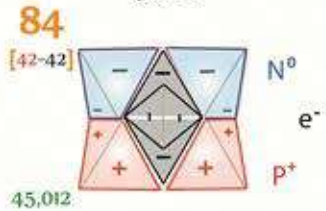
Deuterium is the building block of all elements in the period table

$A_r = 45{,}012$ Deuterium

Defining Deuterium as having an exact atomic Planck mass of 45012n quanta reflects the true charged geometries of all Elements & their topologies

D

1/6 C



3.320192418e-27 kg

1 Proton [24-12]
1 Neutron [18-18]
1 electron [0-12]
n1

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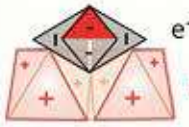
Planck mass-energy units

NAu = 0.001 kg

48
[24-24]



22,512

^{1}H

1.660538841 e-27 kg

One Da is approximately equal to the mass of one proton or one neutron

The unified atomic mass unit (symbol: u) or Dalton (symbol: Da) is a unit that is used for indicating mass on an atomic or molecular scale

270,072

1/12 the mass of a C12 graphene atom at rest in its electronic ground state

1.660538782(83)×10−27 kg

22,506

is an inaccurate means of determining the exact rest mass of a Hydrogen atom

22,512

Carbon 12 has 270,072n planck quanta (270,072 / 12 = 22,506)

Hydrogen has a mass of 22,512n (22,500+12) requiring all mass to be calculated directly using the Planck mass-energy quantum (.001kg / N_A / 22,512) & Tetryonic charge geometries

NA(12u) = 0.012 kg

504
[254-254]

12
C
11.996

270,072

6 [s1]

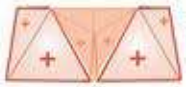
36
[18-18]

22,500

0.499866702 H

1.659653693 e-27 kg

36
[24-12]



22,500

0.499866702 H

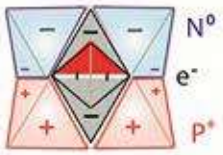
6 Protons [24-12]
6 Neutrons [18-18] n1
6 electrons [0-12]

Carbon has a number of differing atomic configurations (allotropes)

6 Protons [24-12]
6 Neutrons [18-18] n1-2
6 electrons [0-12]

Deuterium is the building block of all elements

84
[42-42]



45,012

^{2}H

3.320192534 e-27 kg

Using Tetryonic theory to define

n Planck mass = $7.376238634 \times 10^{-32}$ Kg

(see Tetryonics QM 15.04)

exact atomic rest masses for all particles, elements and compounds can be determined directly from atomic theory

N_A = 6.02214179 e23

The mole is the amount of substance of a system which contains as many elementary entities as there are atoms in 0.012 kilogram of carbon 12; its symbol is "mol".

504
[252-252]

6
C
12.6493

284,760

[He] 2s2 2p2

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Planck mass-energy contributions to the measured weights of periodic, elementary mass-Matter topologies

36
[18-18]
N^0
45,000n

1.659653693 e-27 kg

36
[24-12]
P^+
45,000n

Baryons have 2,25e23 Planck quanta comprising their rest Matter topologies

[930.974 MeV]

Δ 1875 x

[496.5 keV]

12
[0-12]
e-
12n

8.851486361 e-31 kg

Leptons have 1.2 e20 Planck quanta comprising their rest Matter topologies

[496.5 keV]

Δ 36,711 x

[13.6 eV]

2.41110961l e-35 kg

n
[v-v]
γ

0
KEM

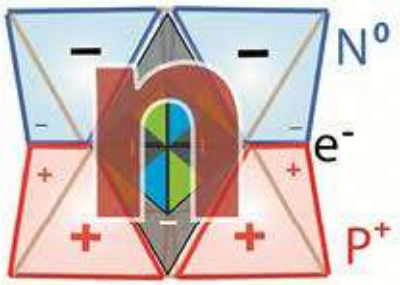
Photons are planar geometries [Matter-less] (purely Kinetic mass-Energy and momenta)

The Lyman alpha spectral line mass-energy contribution to the mass of a Deuterium nucleus is negligible

Electron quantum level energies are determined by the energy of the Nuclei they bind to in elements

D^+
[1.862 GeV]

84
[42-42]



90,012n+

Photons contribute spectral mass-energies to the nuclei mass but are themselves Matterless [2D zero rest mass-energies]

Photons are 2π charge mass-energy geometries

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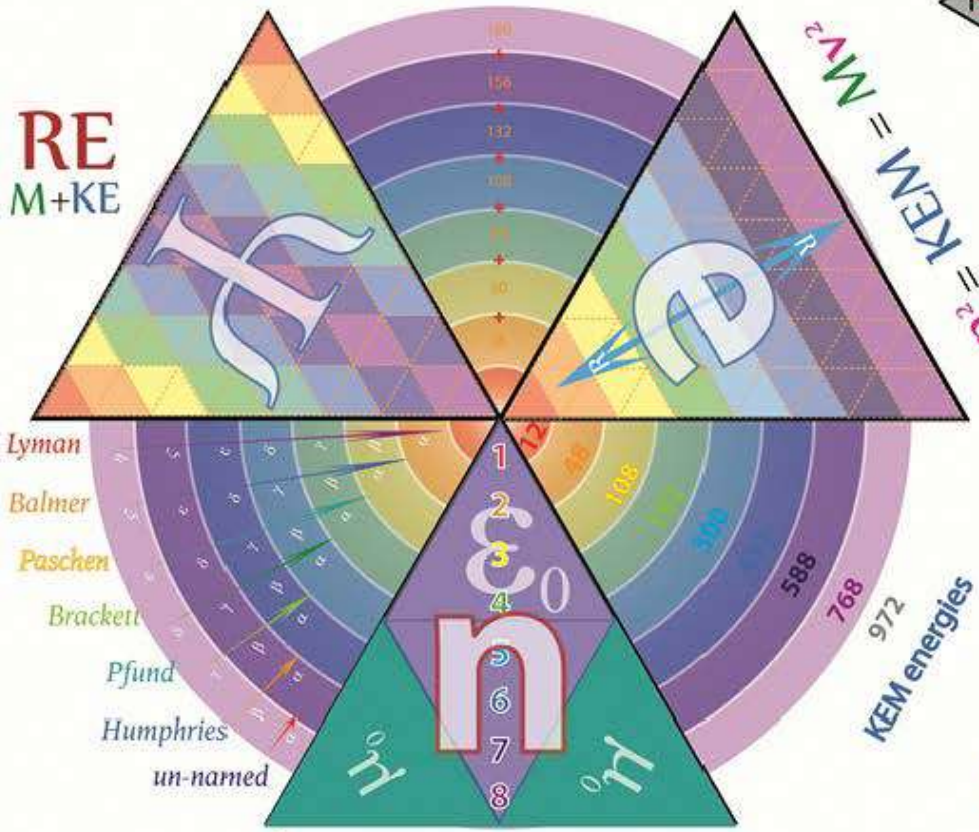
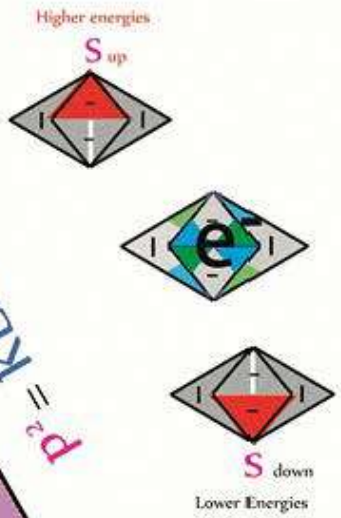
Ionisation energies

Fractional quantum differentials





$hf = \Delta Mv = \Delta p$

spectral lines are produced by accelerating electrons

Note: this is an Illustrative schema for modelling KEM field energies
All KEM fields possess the same physical spatial geometry
in radial-time defined spatial co-ordinate systems

c^2 c^4

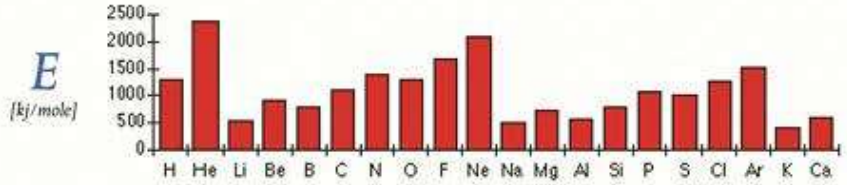
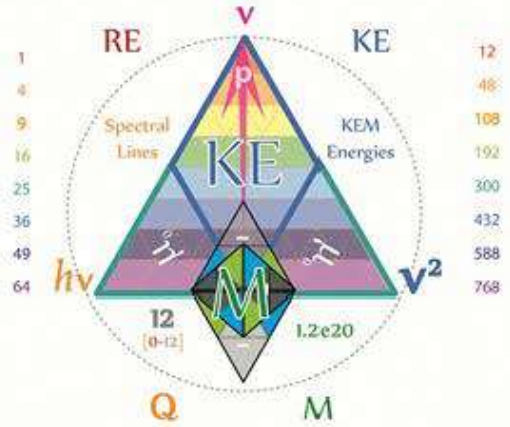


Photo-electrons absorb/emit spectral energies

$$E = eV = \frac{1}{4\pi\epsilon_0}\frac{ne^2}{a}$$

photo-electronic energy momenta



Mapping photo-electron transition energies to Tetryonic energy momenta geometries reveals many key facts about the ionisation energies of nuclei

$$E = -\frac{Z^2}{n^2}\frac{ke^2}{2a_0} = -\frac{13.6Z^2}{n^2}eV$$

The differing fractional KEM field energy momenta of electrons that results from their transitions to specific energy nuclei in elements results in differing QAM quanta and produces spectral lines and fine line splitting

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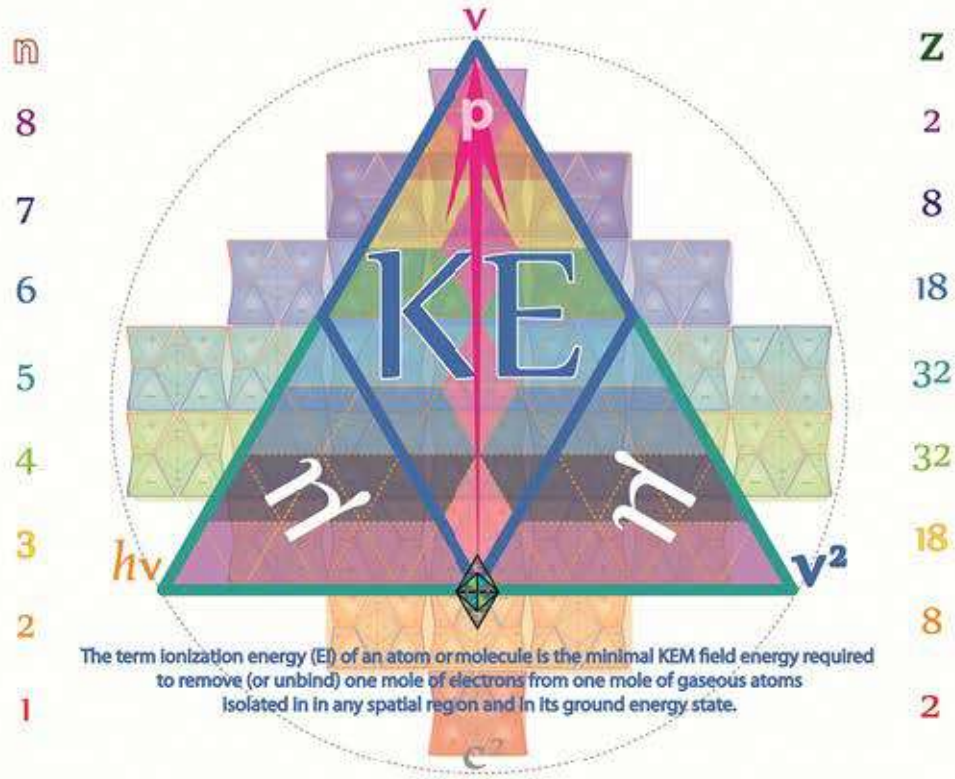
Elementary ionisation energies



The term ionization energy (EI) of an atom or molecule is the minimal KEM field energy required to remove (or unbind) one mole of electrons from one mole of gaseous atoms isolated in in any spatial region and in its ground energy state.

The term "ionization energy" is sometimes used as a name for the work needed to remove (or un-bind) the highest energy photoelectron from an atom or molecule.

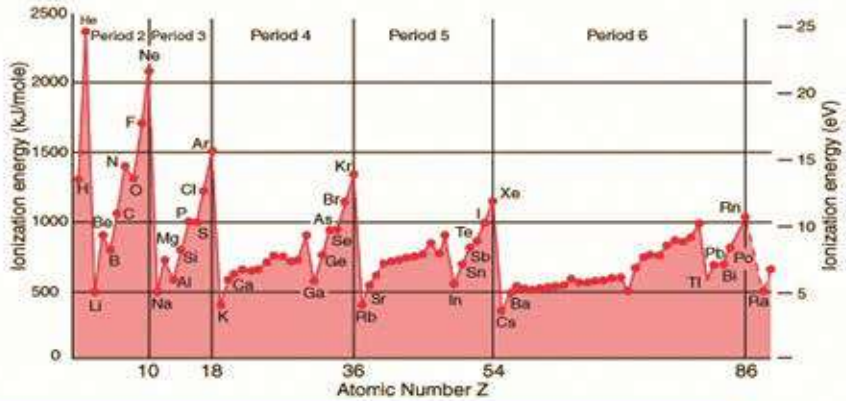
However, due to interactions with surfaces, this value differs from the ionization energy of the atom or molecule in question when it is located by itself in free space.

So, in the case of surface-adsorbed atoms and molecules, it may be better to use the more general term "electron binding energy", in order to avoid confusion.

Both these names are also sometimes used to describe the work needed to remove an electron from a "lower" orbital (i.e., not the topmost orbital) for both free and adsorbed atoms; in such cases it is necessary to specify the orbital from which the electron has been removed

$$E = -\frac{Z^2}{n^2}\frac{ke^2}{2a_0} = -\frac{13.6Z^2}{n^2}eV$$

Every electron in each elementary orbit has a unique ionisation energy



Nuclei	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	per shell

Element number

R	119	120																															
Q	87	88	113	114	115	116	117	118																									
P	55	56	81	82	83	84	85	86	103	104	105	106	107	108	109	110	111	112															
O	37	38	49	50	51	52	53	54	71	72	73	74	75	76	77	78	79	80	89	90	91	92	93	94	95	96	97	98	99	100	101	102	
N	19	20	31	32	33	34	35	36	39	40	41	42	43	44	45	46	47	48	57	58	59	60	61	62	63	64	65	66	67	68	69	70	
M	11	12	13	14	15	16	17	18	21	22	23	24	25	26	27	28	29	30															
L	3	4	5	6	7	8	9	10																									
K	1	2																															
Shells																																	
	s1	s2	p1	p2	p3	p4	p5	p6	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12	f13	f14	

Orbitals

sub-orbitals

8	2
7	8
6	18
5	32
4	32
3	18
2	8
1	2

Energy level

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Hyperfine splitting and Lamb Shifts

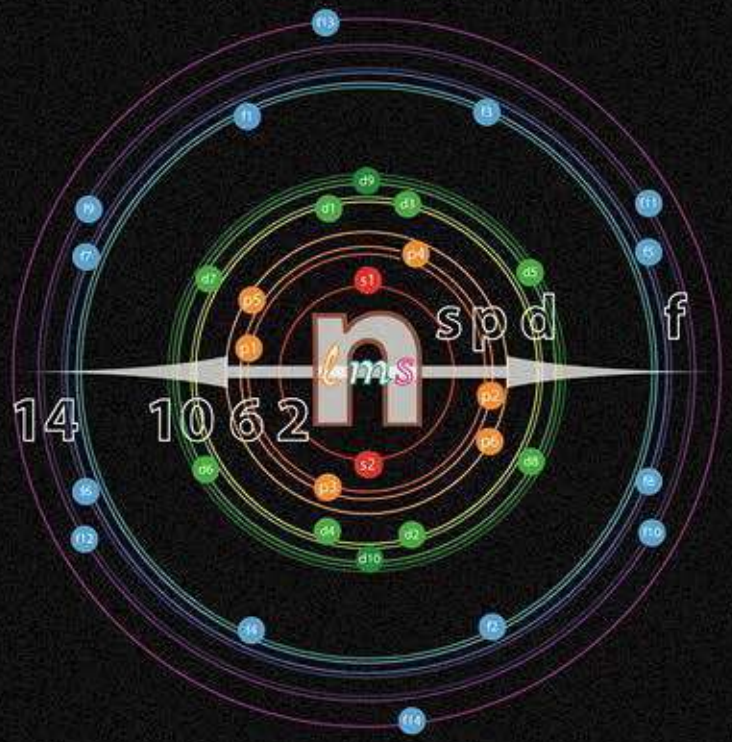
When the spectral lines of the hydrogen spectrum are examined at very high resolution, they are found to be closely-spaced doublets.
This splitting is called fine structure and was one of the first experimental evidences for electron spin.

The fine structure describes the splitting of the spectral lines of atoms due to first order relativistic corrections (principal quantum energies)

n

Differing electron spins within shells & quantum levels produces Hyperfine splitting

atomic shell energies result from Series addition of baryonic energies



If you measure the atomic energy levels of photo-electrons at an extremely high resolution, you'll find small deviations of individual KEM field energies of electrons in sub-orbitals which are primarily the result of parallel and anti-parallel electron spins

Higher energy
Parallel
Magnetic moments

Lower energy
Anti-parallel
Magnetic moments

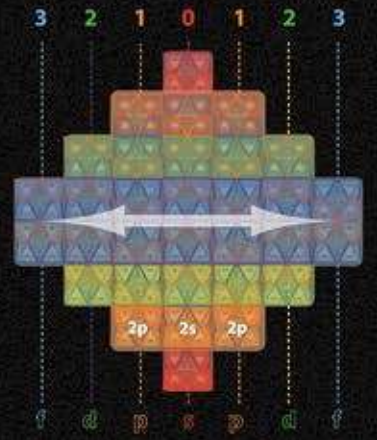
All electron spins are referenced to the Nuclear magneton

The electron energy levels of Hydrogen should depend only on the principal quantum number n.

In 1951 it was discovered that this was not so, the $2p_{(1/2)}$ state is slightly less than the $2s_{(1/2)}$ state resulting in the Lamb shift

l m s

Differing electron sub-Orbtial energies create Lamb Shifts



electron sub-orbital energies are Parallel energy configurations

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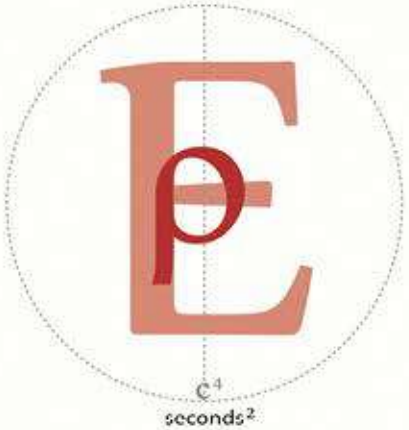
M_0

3D Matter topologies are comprised of charged 2D mass-energies

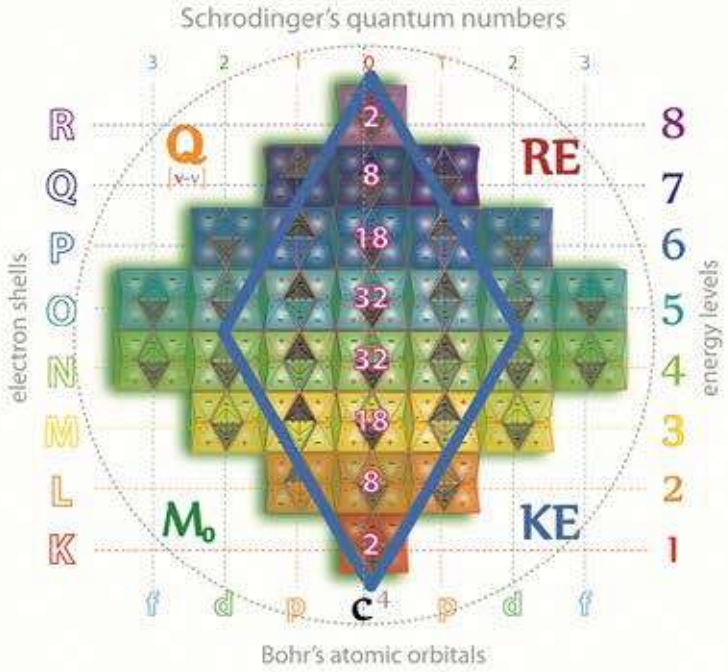
Energy per second²



RE

Relativistic mass-ENERGY-Matter

Relativity fails at the foundational level to explain and differentiate between mass-ENERGY and Matter in physical systems



Einstein's relativistic [Lorentz corrected] stress energy tensor aggregates all forms of energy into a single energy density gradient

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Matter · Planck quanta · mass · velocity

atomic energies

$$\frac{Tmn}{c^4} + \frac{mv^2}{c^2}$$

electron spins

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

mass · Planck quanta · mass · velocity

mass-Matter

standing wave mass-energiescreate
the material substance of all chemical elements

3D rest Matter + Lorentz corrected 2D Kinetic Energies
= total Relativistic Energies

KE

2D equilateral mass-energies are euclidean geometries

Energy per second

mass-energies

radiant planar mass-energies create
EM fields, spectral lines & chemical interactions

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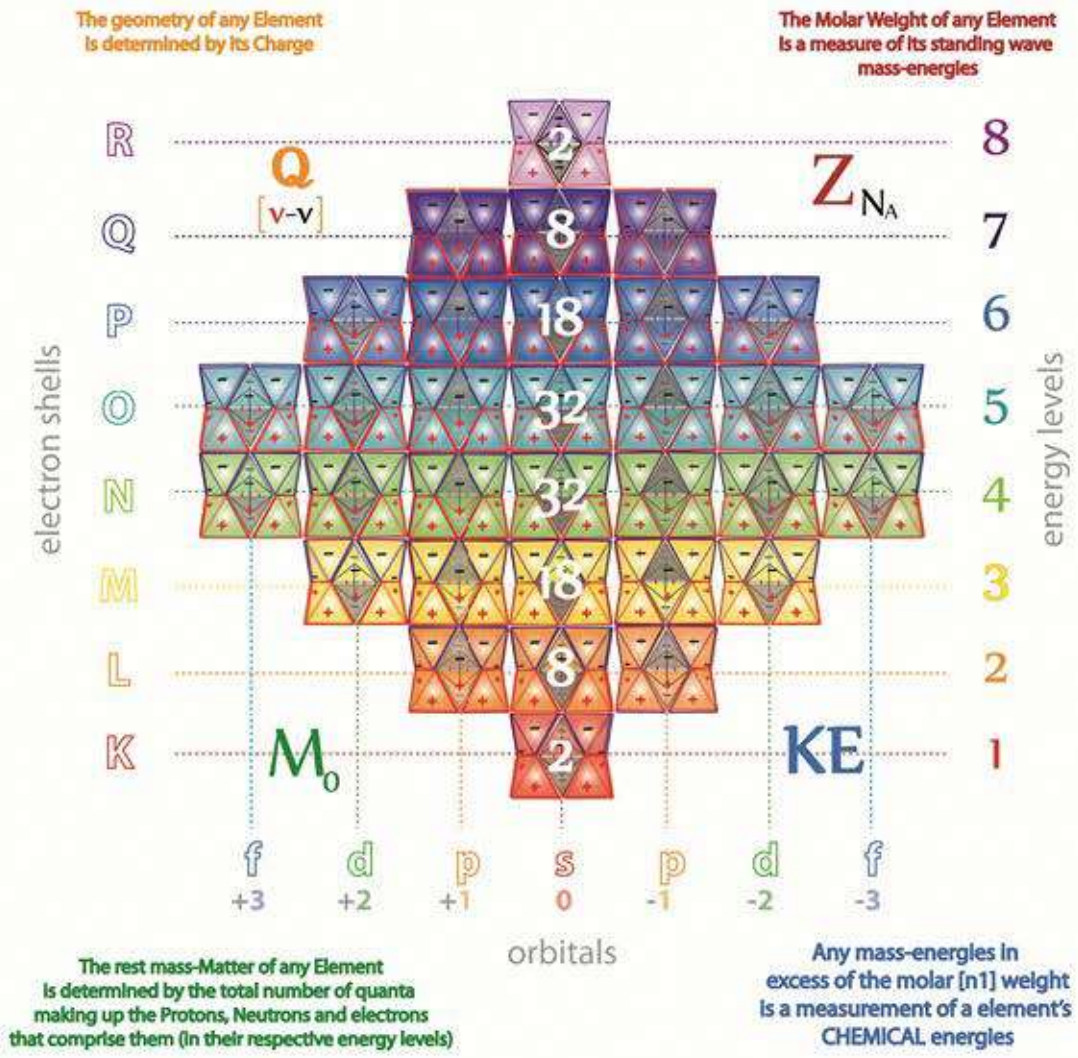
Deuterium is the building block of all Elements (save Hydrogen)



Important point to note:
The Kinetic Energy difference between any Element's total [n1] Deuteron mass-energies and its Molar mass has historically been incorrectly explained as resulting from an excess number of Neutrons in the atom it is not, Z# = (number of Protons = number of electrons = number of Neutrons)

Elementary mass-Matter

$$\sum_{K}^{R}$$

n per nuclei 1e19v = n		
2	2 nuclei [74,496 ea]	120 Unbinilium 119 Ununennium
+		
8	8 nuclei [69,780 ea]	118 Ununoctium 87 Francium
+		
18	18 nuclei [65,232 ea]	112 Copernicium 55 Caesium
+		
32	32 nuclei [60,852 ea]	102 Nobelium 37 Rubidium
+		
32	32 nuclei [56,640 ea]	70 Ytterbuim 19 Potassium
+		
18	18 nuclei [52,596 ea]	30 Zinc 11 Sodium
+		
8	8 nuclei [48,720 ea]	10 Neon 3 Lithium
+		
2	2 nuclei [45,012 ea]	2 Helium 1 Deuterium

The rest mass-Matter of any Element is the sum total of its constituent Z[n²] energy level Deuterium nuclei

Aufbau

$$Z\# \begin{bmatrix} z\ \text{Protons} & [24\text{-}12] \\ z\ \text{Neutrons} & [18\text{-}18] \\ z\ \text{electrons} & [0\text{-}12] \end{bmatrix} n1\text{-}8$$

(ie Calcium [20] = 2+8+10 n level Deuterium nuclei)

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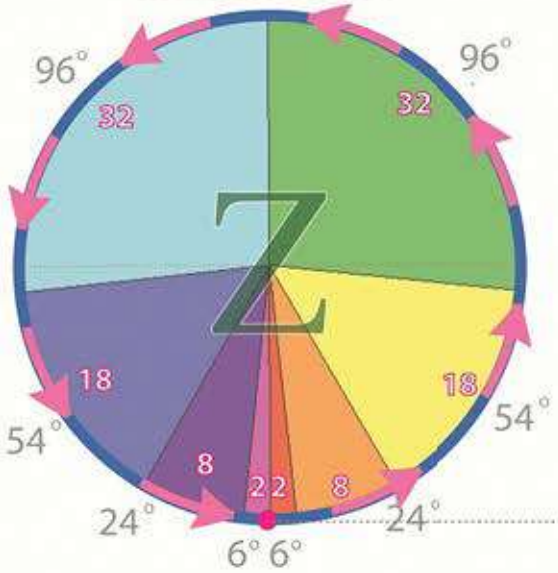
Periodic Harmonic motions

$x = A \cos(\omega t + \varphi)$

Much of the math in of modern physics is predicated on the assumption that π [where it appears] is related to the properties of a circle

$F = -kx$

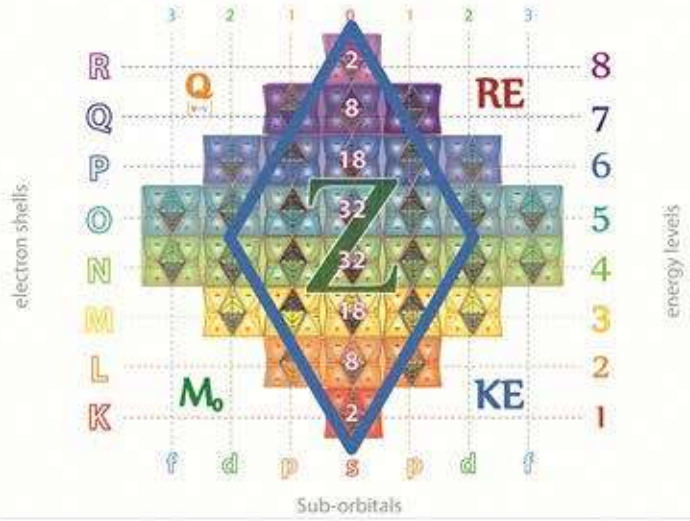
Circular motion



Linear motion

Simple harmonic motion can be visualized as the projection of uniform circular motion onto one axis

Principal Quantum Numbers



circular harmonic motion

Circular motions describe the motion of a body with a changing velocity vector [the result of an acceleration force].

simple harmonic motion

Nuclei per shell in elements follows a 'periodic summation rule' that is reflective of photonic energies

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$$\sum_{K}^{R}$$

nuclei per shell

$$\sum_{K}^{R} \quad {}^{P}\sum Z \quad \sum_{1}^{120} Z$$

element number

Periodic Summation

Periodic summation is a notation developed for Tetryonic theory to model the geometric series addtion of Z[n²] energy level Deuterium nuclei that form the periodic elements

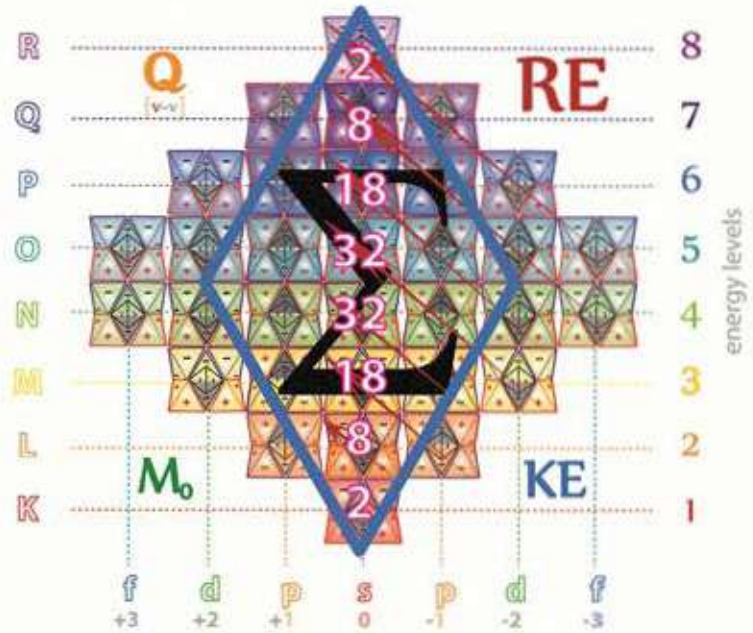
STEP ONE

Periodic summation follows the atomic shell electron config

STEP TWO

Periodic elements build up following the aufbau sequence

$$\begin{matrix}1\\2\\3\\4\\4\\3\\2\\1\end{matrix}\ {}^{R}_{K}\sum {}^{P}\sum 2(x^2) = \begin{matrix}2\\8\\18\\32\\32\\18\\8\\2\end{matrix}\ \begin{matrix}R\\Q\\P\\O\\N\\M\\L\\K\end{matrix}$$



${}^{P}\sum R = 2$	2 nuclei [74.496 ea]	120	Unbinilium
+			
${}^{P}\sum Q = 8$	8 nuclei [69,780 ea]	118	Ununoctium
+			
${}^{P}\sum P = 18$	18 nuclei [65,232 ea]	110	Darmstadtium
+			
${}^{P}\sum O = 32$	32 nuclei [60,852 ea]	92	Uranium
+			
${}^{P}\sum N = 32$	32 nuclei [56,640 ea]	60	Neodymuim
+			
${}^{P}\sum M = 18$	18 nuclei [52,596 ea]	28	Argon
+			
${}^{P}\sum L = 8$	8 nuclei [48,720 ea]	10	Neon
+			
${}^{P}\sum K = 2$	2 nuclei [45,012 ea]	2	Helium
		0	Hydrogen

Each atomic shell can hold only a fixed number of deuterium nuclei

THe LHS of the notation determine the number of nuclei in each atomic shell, from the periodic mass-energy levels for atoms, and the RHS follows the aufbau building principle to determine the rest mass-Matter of any specific element

Aufbau

Each periodic element is made of Z [n² energy] deuterium nuclei

$$Z\# \begin{bmatrix} z\ \text{Protons} & [24\text{-}12] \\ z\ \text{Neutrons} & [18\text{-}18] \\ z\ \text{electrons} & [0\text{-}12] \end{bmatrix} n1\text{-}8$$

Planck mass-energies form the surface integral of rest Matter topologies for each periodic element

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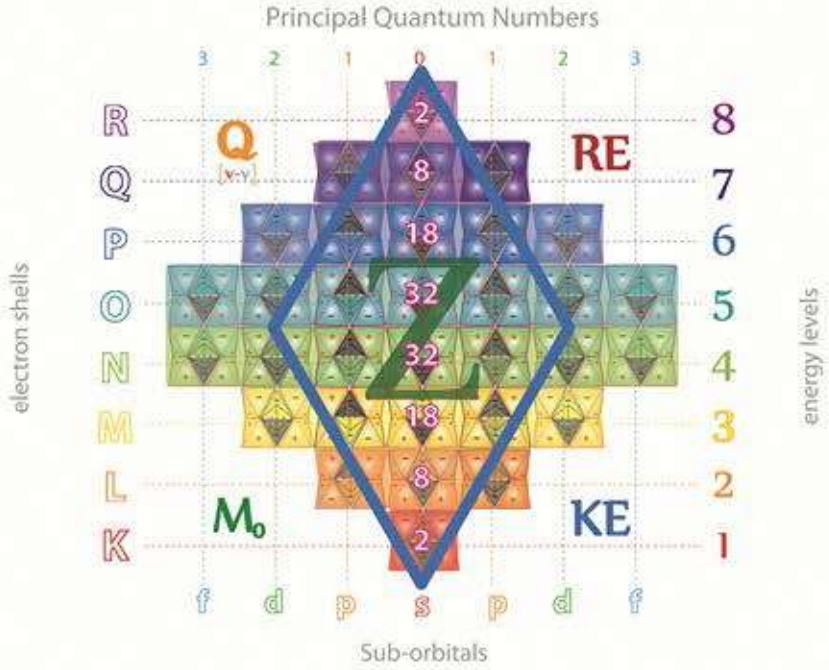
Element numbers

Nuclei per shell in elements follow a 'periodic summation rule' that is reflective of photonic energies

$$\sum_{K}^{R} 2(x^2) = 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2$$

$$Z$$

120	Unbinilium	n8
119	Ununennium	
118	Ununoctium	n7
87	Francium	
112	Copernicium	n6
55	Caesium	
102	Nobelium	n5
37	Rubidium	
70	Ytterbuim	n4
19	Potassium	
30	Zinc	n3
11	Sodium	
10	Neon	n2
3	Lithium	
2	Helium	n1
1	Deuterium	
Hydrogen	0	



Periodic mass-ENERGY-Matter

Following periodic summation rules for shell filling n[1-8] quantum energy deuterium nuclei combine to form elementary Matter

$$\sum_{K}^{R} {}_{25}^{32}\Big[\,[72(n)^2]+[12e19]+[m_e v^2]\,\Big]_{1}^{8}$$

Baryon rest masses · lepton rest mass · KEM

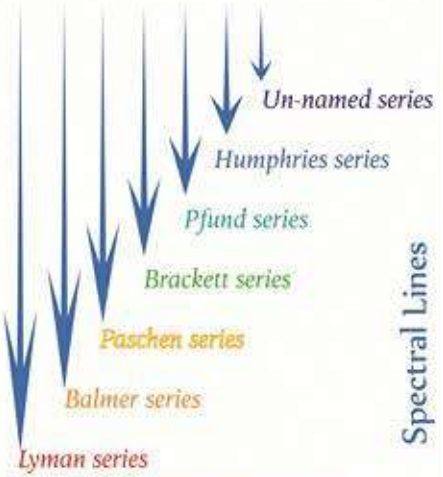
Deuterium mass-energy per shell

The measured weight of Matter in gravitational fields is the result of planar mass-energies in tetryonic standing-wave geometries

The periodicity of all the elements, along with their exact molar rest mass-energies and quantum wavefunctions can be described with Tetryonic geometries

Ionisation energies

$$\gamma$$



$$Mv^2 = KEM = hcR_H$$

Photon emission/absorption

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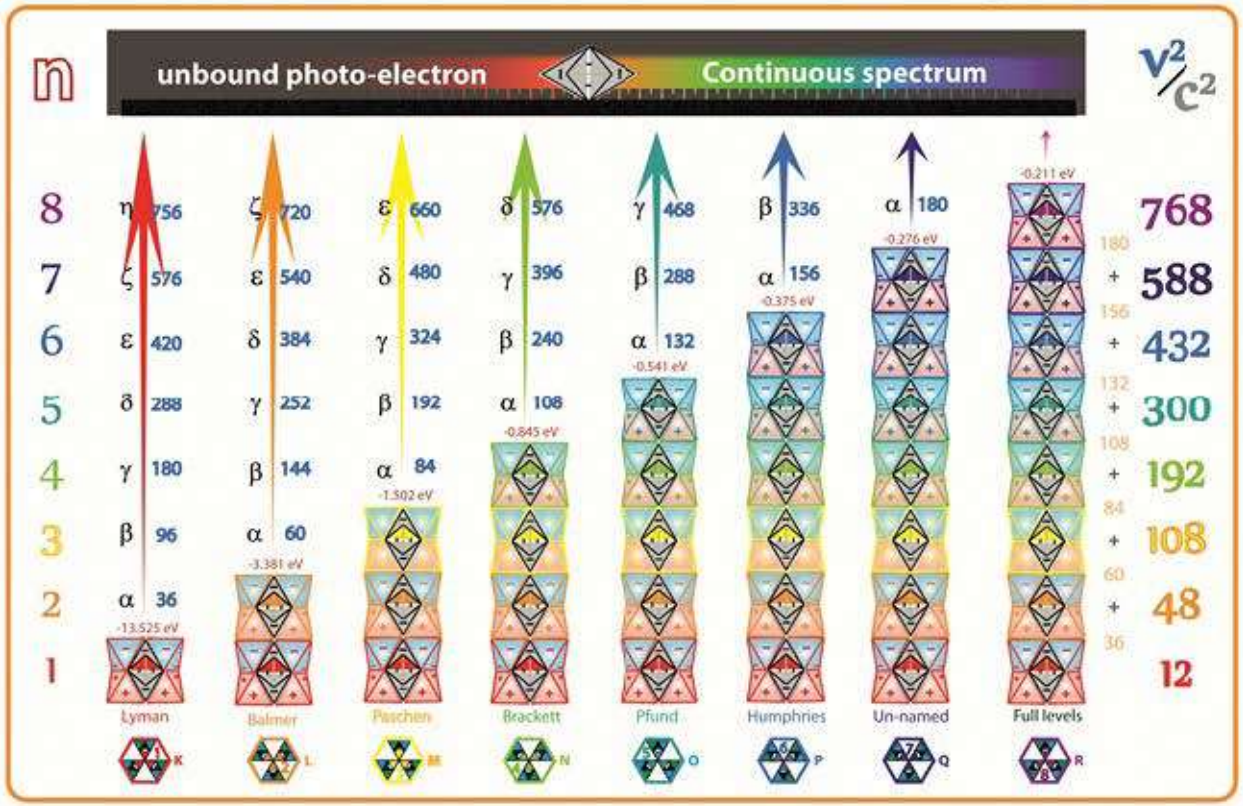
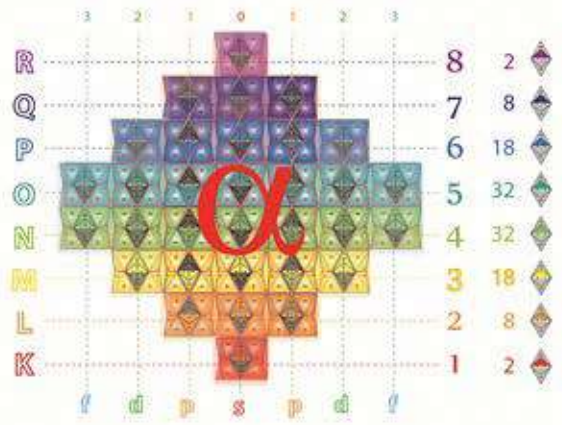
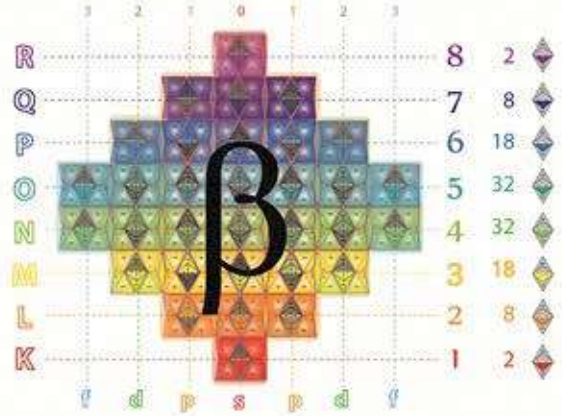
Photo-electron ionisation energies

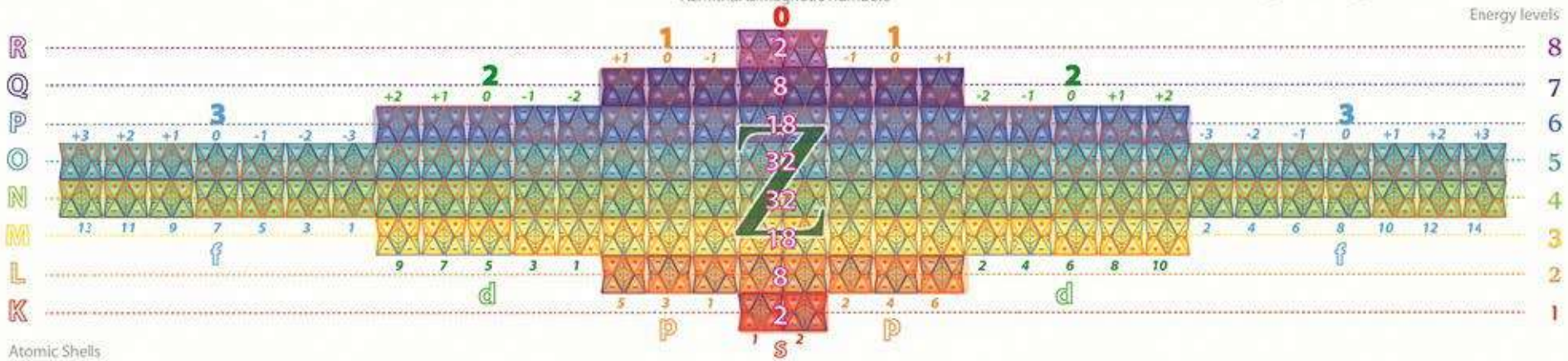




Opposed electron spins results in Hyperfine splitting & Lamb shifts



Energy levels



Azmithal & Magnetic numbers

Atomic Shells

Orbitals & sub-Orbitals

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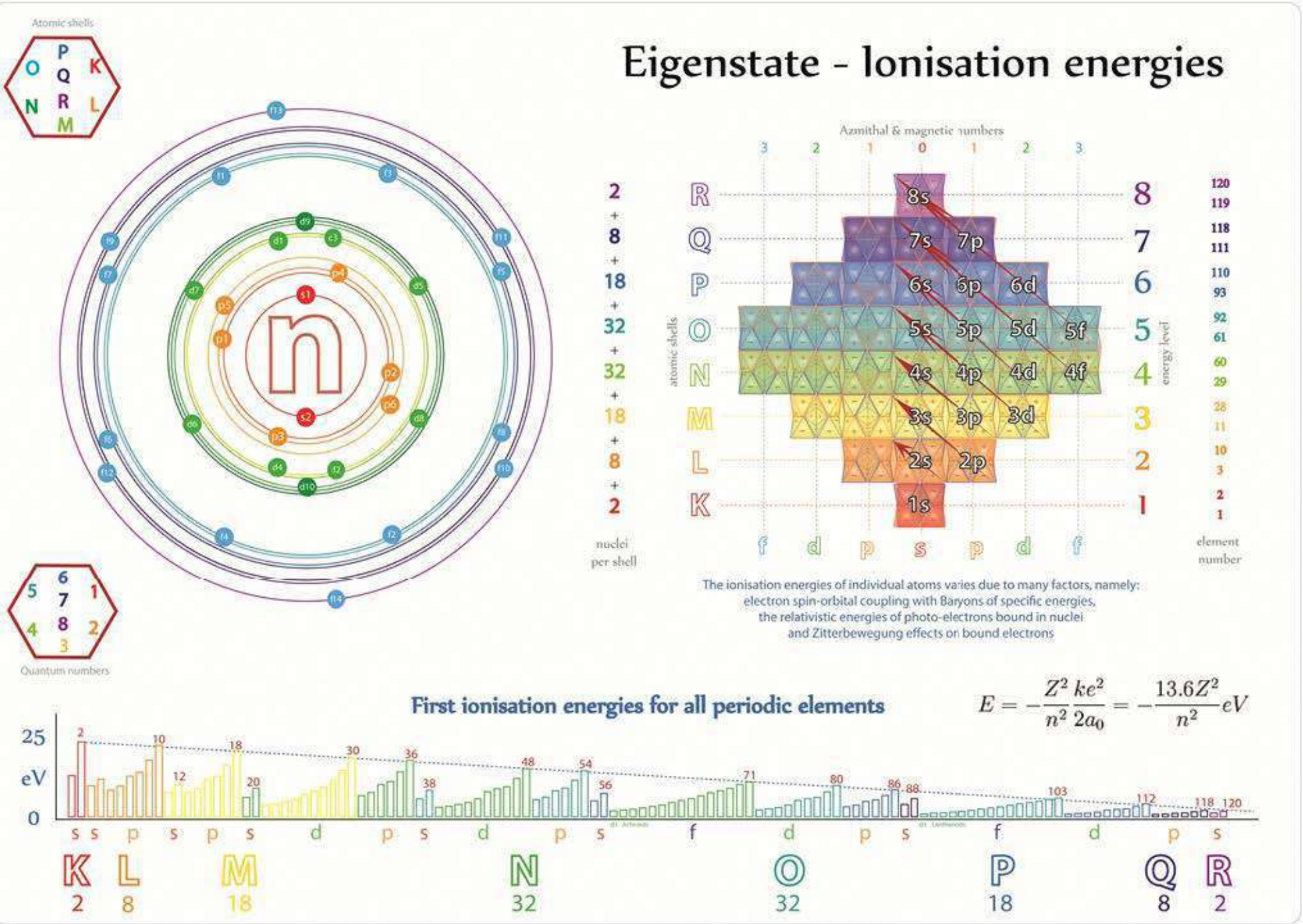

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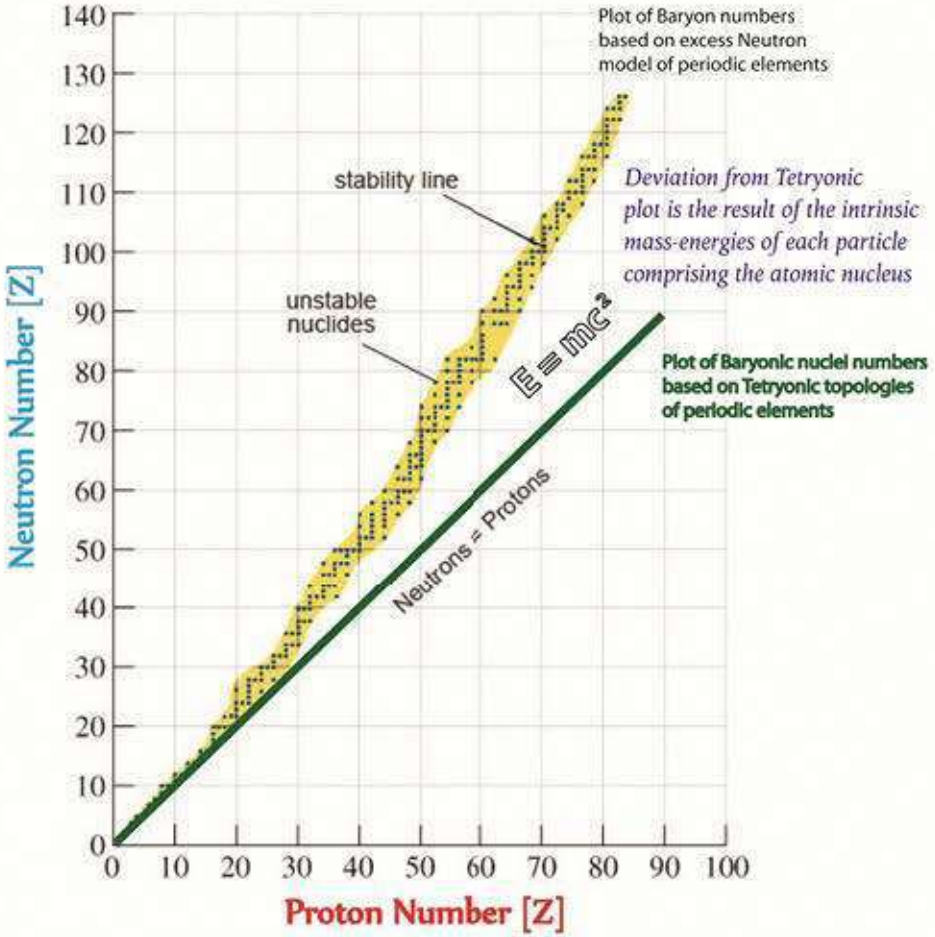
Proton - Neutron Curve

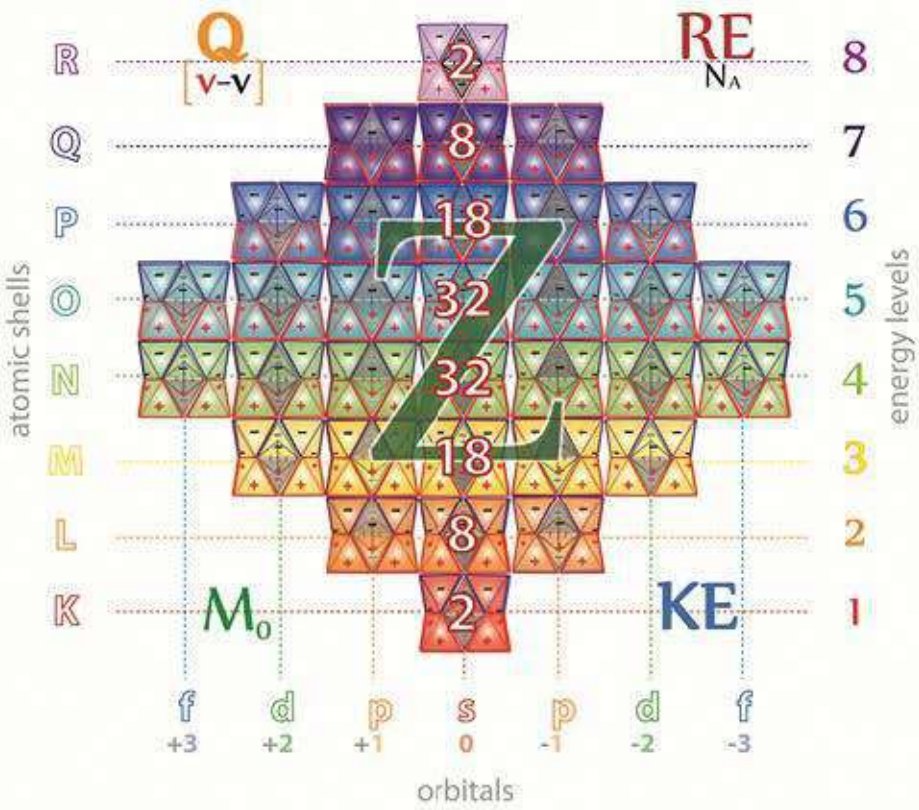
The graph below is a plot of neutron number against proton number.
It is used as rule to determine which nuclei are stable or unstable.


Plot of Baryon numbers based on excess Neutron model of periodic elements
stability line
unstable nuclides
Deviation from Tetryonic plot is the result of the intrinsic mass-energies of each particle comprising the atomic nucleus
E=mc²
Plot of Baryonic nuclei numbers based on Tetryonic topologies of periodic elements
Neutrons = Protons
Neutron Number [Z]
Proton Number [Z]
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Historically, Proton-electron numbers are viewed as being equivalent in neutral elementary matter with the excess molar mass measured being the result of 'excess or extra' Neutrons in the atom

Atomic Nuclei Numbers

All periodic elements have an EQUAL number of Protons, Neutrons & Electrons with their molar mass-Matter being determined by their quantum level mass-energies



Tetryonic modelling of the charged mass-ENERGY-Matter topologies of elementary atoms and the nuclei that comprise them, reveals a DIRECT LINEAR relationship for the number of Protons-electrons-Neutrons in all periodic elements and nuclear isotopes

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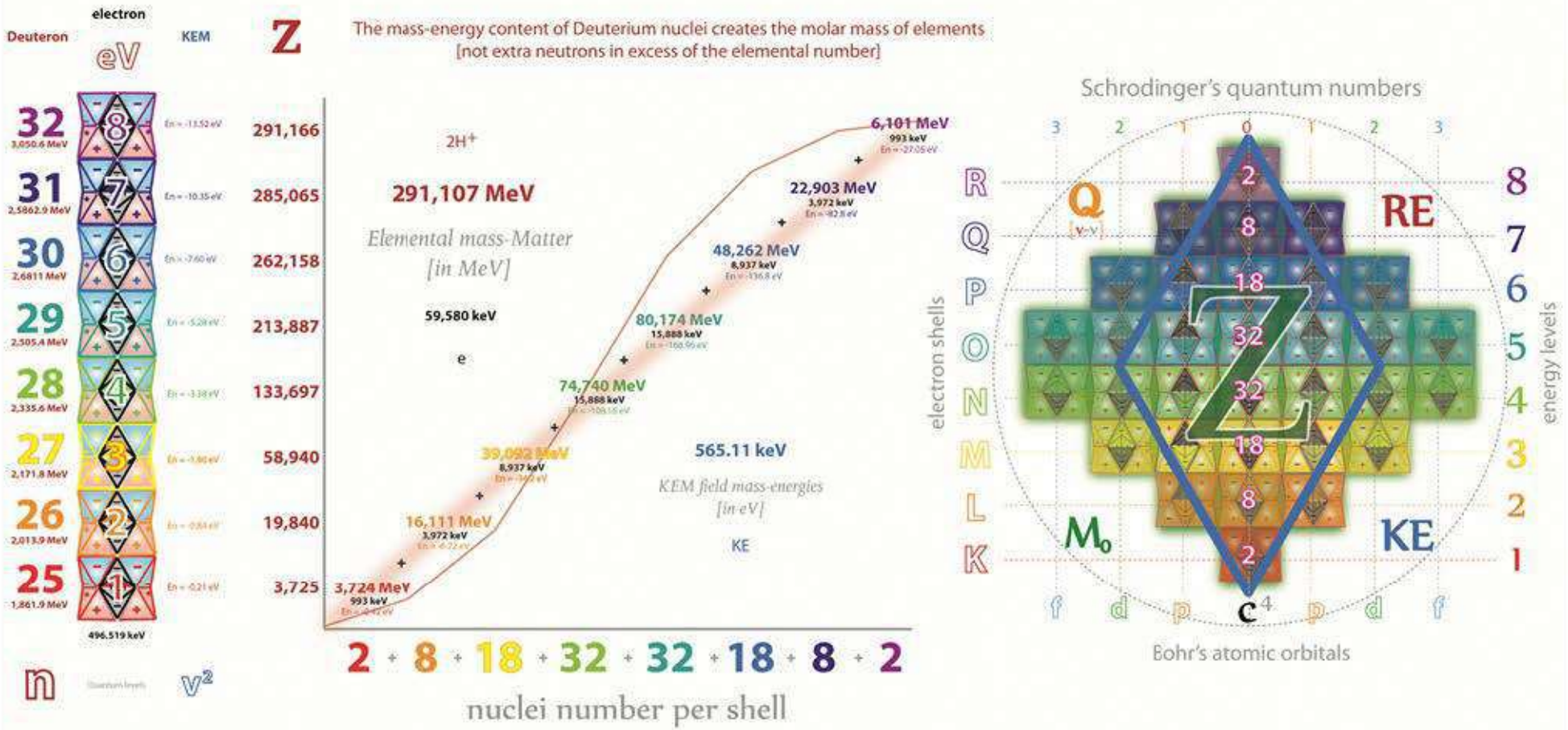
Planck mass-energy contributions to elementary Matter and isotopes



n1 Elementary nuclei

are comprised of equal numbers of Protons, Neutrons & electrons with varying energy levels

Baryons		electrons		KEM fields
930.947 MeV	+	496.519 keV	+	13.525 ev

The mass-energy content of Matter topologies is velocity invariant

The mass-energy content of Baryons determines the KEM field of electrons

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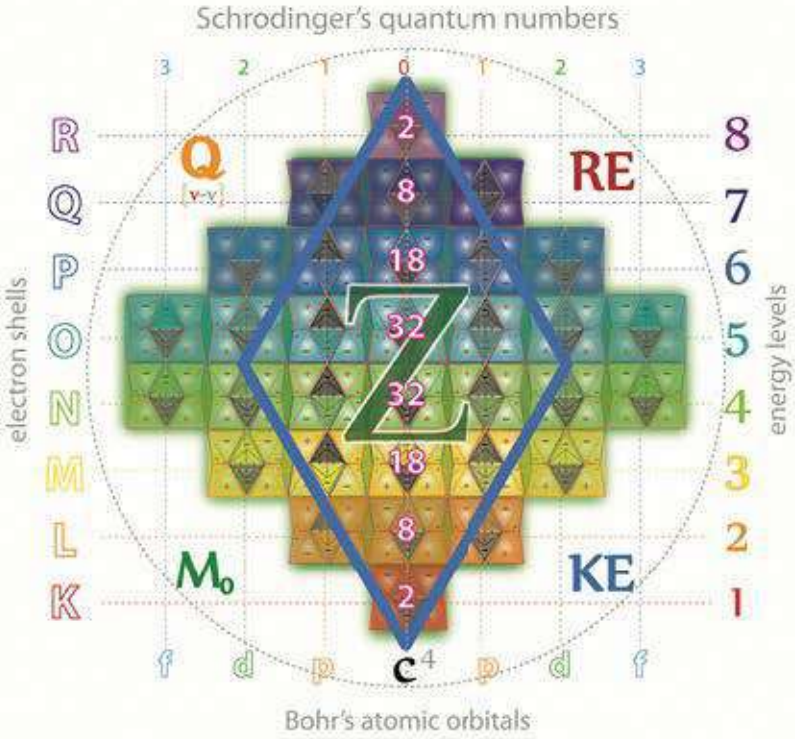
Baryons **930.947 MeV** + KEM fields **13.525 ev** + electrons **496.519 keV**

Mapping Planck mass-energy contributions to elementary Matter and isotopes



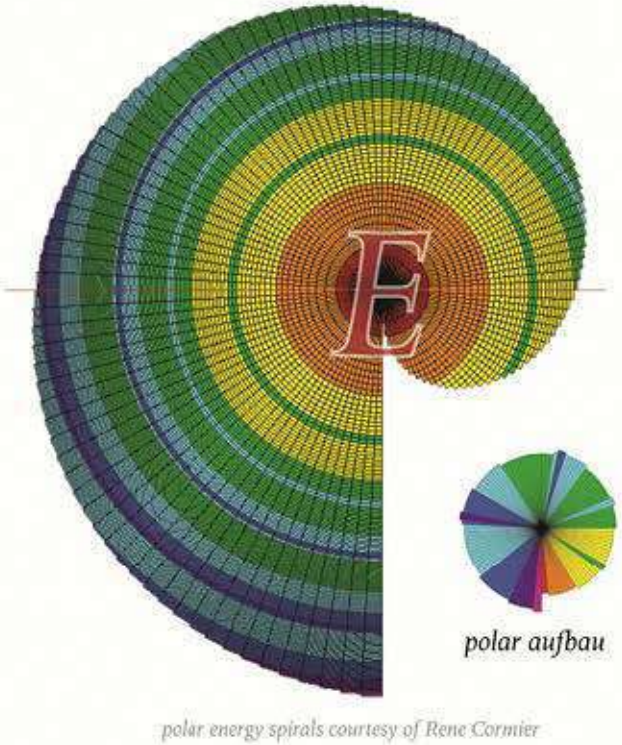
$$E = hv^2$$

$$n^2 + v^2 + e = Z$$

general form quatratic equation

$$ax^2 + bx + c = Z$$

$$E = nhv$$



polar energy spirals courtesy of Rene Cormier

Identifying electron rest Matter topologies as velocity invariant we can re-arrange the component Planck mass-energy geometry formulation of periodic elements to

$$h\left[72[v^2]_{\text{Deuteron rest mass}} + v_{\text{Spectral lines}} + 1.20\,e20\,v_{\text{electron rest mass}}\right]$$

reveal a quadratic formulation for all Z numbers

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All elements are comprised of n level Duetrium nuclei

Baryons **KEM fields** **electrons**

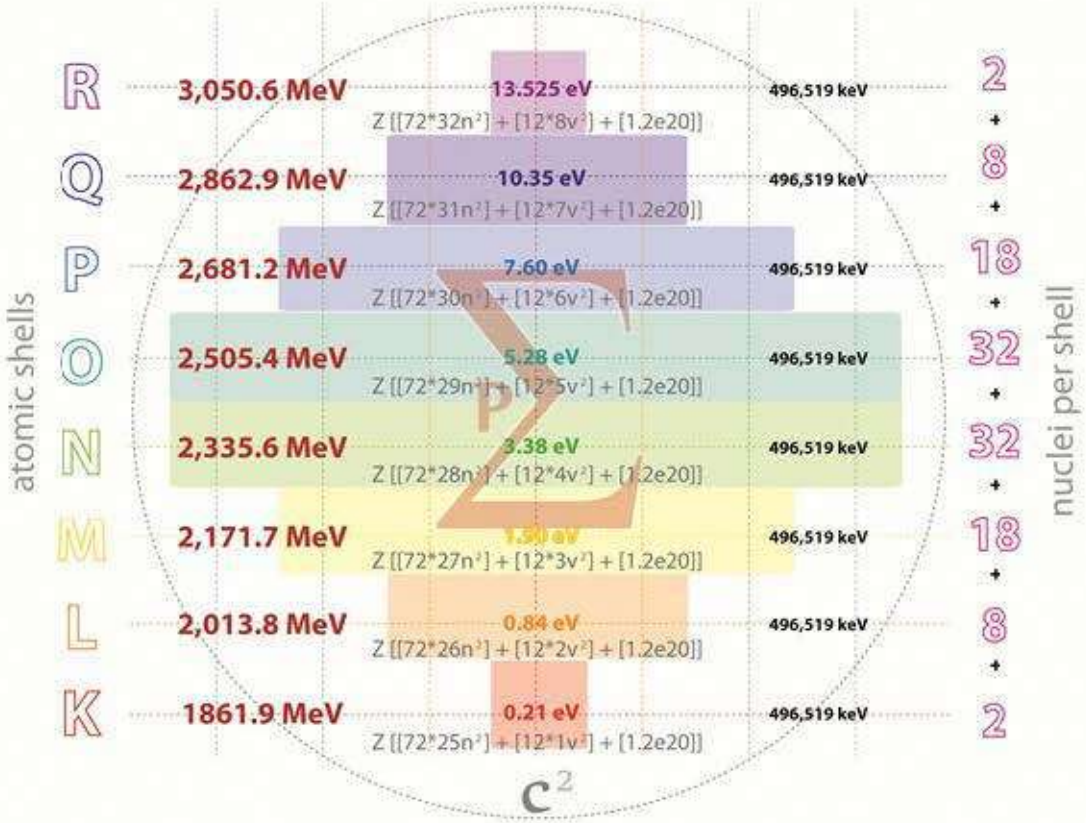
$$Z\,[[72n^2] + [12v^2] + [1.2e20]]$$

1,861,949 MeV **13.525 eV** **496,519 keV**

$2H^+$ $[72n^2]$ Z γ $[M_e v^2]$

Elemental mass-Matter [in MeV]

The atomic shell energy levels of Deuterium nuclei in elements



6,101 MeV
993 keV
En = -27.05 eV
+
22,903 MeV
3,972 keV
En = -82.8 eV
+
48,262 MeV
8,937 keV
En = -316.8 eV
+
80,174 MeV
15,888 keV
En = -168.96 eV
+
74,740 MeV
15,888 keV
En = -108.10 eV
+
39,092 MeV
8,937 keV
En = -34.2 eV
+
16,111 MeV
3,972 keV
En = -6.72 eV
+
3,724 MeV
993 keV
En = -0.42 eV

$[1.2e20]]$

e

Determines the spectral line [KEM field energies] of electrons bound to them

The relativistic rest mass-energy-Matter of all periodic elements

is the sum of the mass-energies of all atomic nuclei and spectral lines that comprise its mass-Matter topology as measured in any spatial co-ordinate system per unit of time

the rest mass-Matter of bound photo-electrons is velocity invariant

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Avagadro's number

1 KG mass
[of Matter]

6.022141579 e26
atoms in 1KG of Matter

1.660538841 e-27 kg
atomic rest mass-Matter

Hydrogen

01

using SI units Avagadro's number can be expressed exactly as the inverse rest mass of Hydrogen

Weighted atomic mass

Carbon

12

5.019789213 e25
atoms in 1KG of Matter

6.02214078 e 23

1.99211552 e-26 kg
atomic rest mass-Matter

Tetryonic charge geometries make weighted atomic mass measurements and calculations obsolete

22,506 1/12 of Carbon 12 [Graphene] is not equal to 1 Hydrogen atom 22,512
(Deuterium is the building block of all atomic elements)

International Avagadro project

1.966225348 e25
atoms in 1KG of Matter

5.085887033 e-26 kg
atomic rest mass-Matter

Silicon

28

The gram was originally defined in 1795 as the mass of one cubic centimeter of water at 4°C,
making the kilogram equal to the mass of one liter of water.

The prototype kilogram, manufactured in 1799 and from which the current kilogram is based
has a mass equal to the mass of 1.000025 liters of water

In recent years two major experiments, namely the Watt balance & Avagadro projects, have been attempting to
measure and define 1KG of mass-Matter in terms of electrical force and the number of atoms respectively
in order to better define 1KG of mass-Matter precisely for all future physical references

Platinum

191

2.817950081 e24
atoms in 1KG of Matter
3.181804449 e23

90% Pt
10% Ir

La Grande K

The La grande K is an alloy of 90% Platinum & 10% Iridium that has been slowly losing mass since its manufacture

3.1893811012 e-25 kg
atomic rest mass-Matter
3.142870708 e-25 kg

All atomic rest masses are for atoms at absolute zero and any deviation is a measure of the topological Matter's Kinetic energy content [chemical energy, KEM fields and/or spectral lines]

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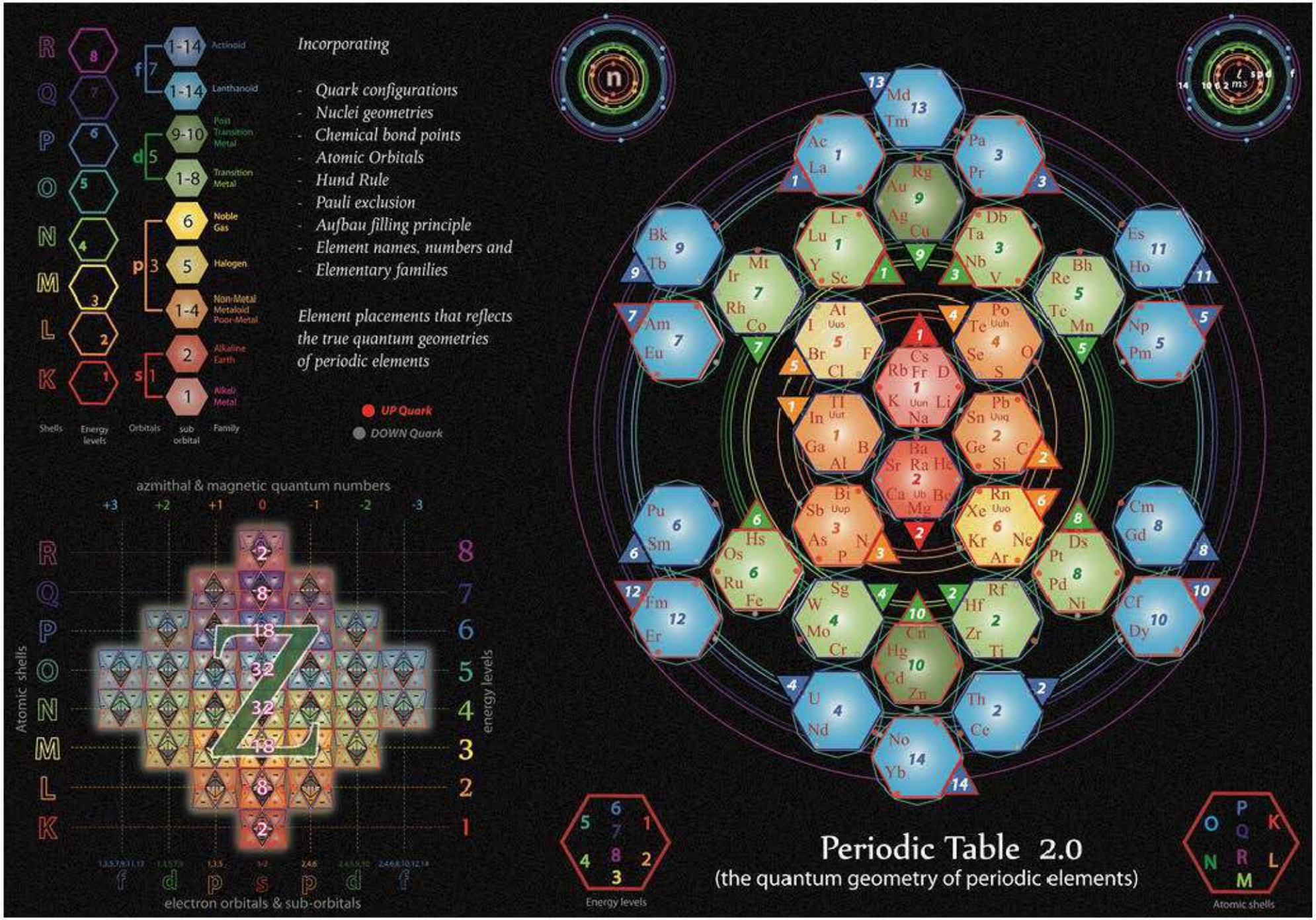

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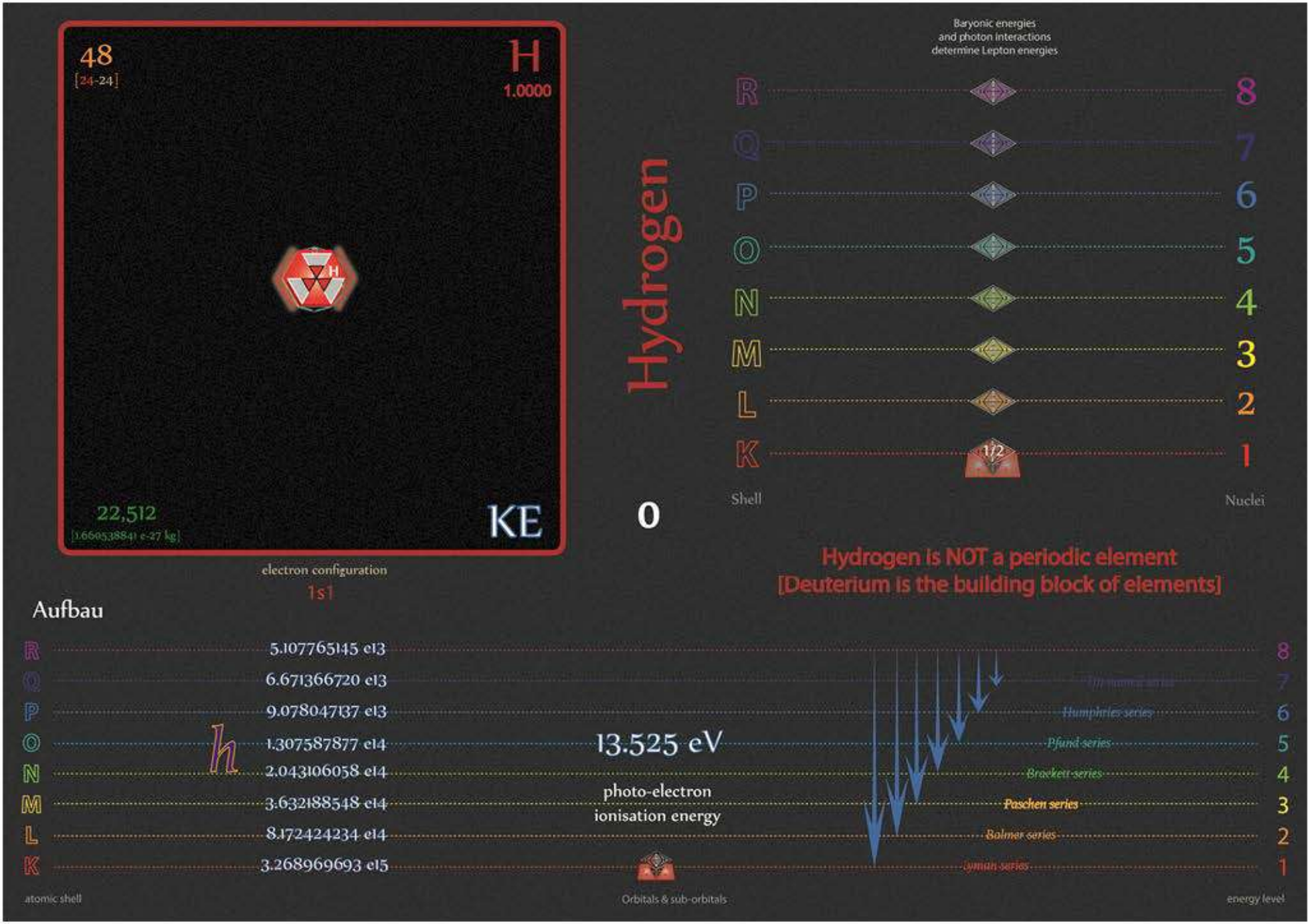

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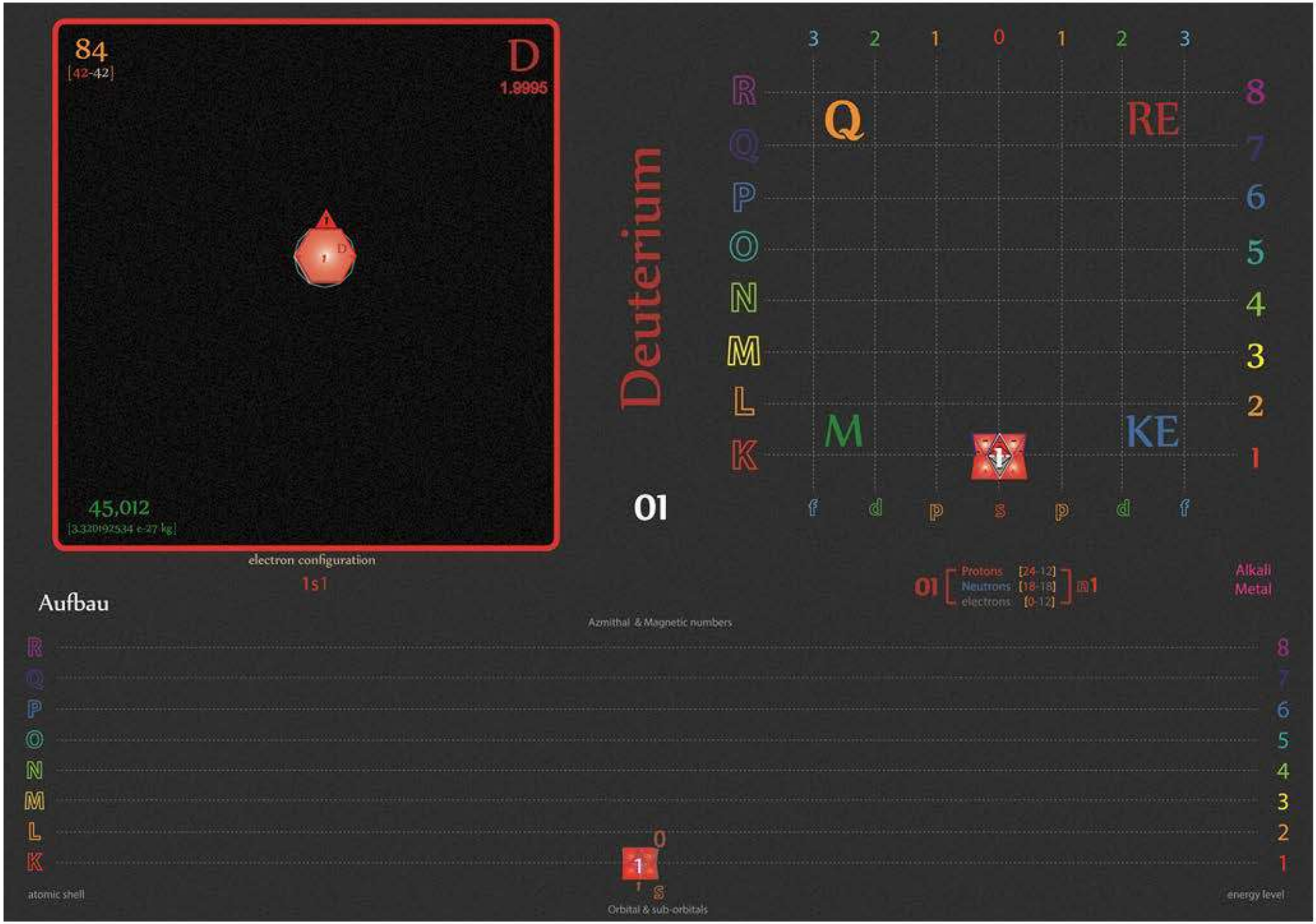

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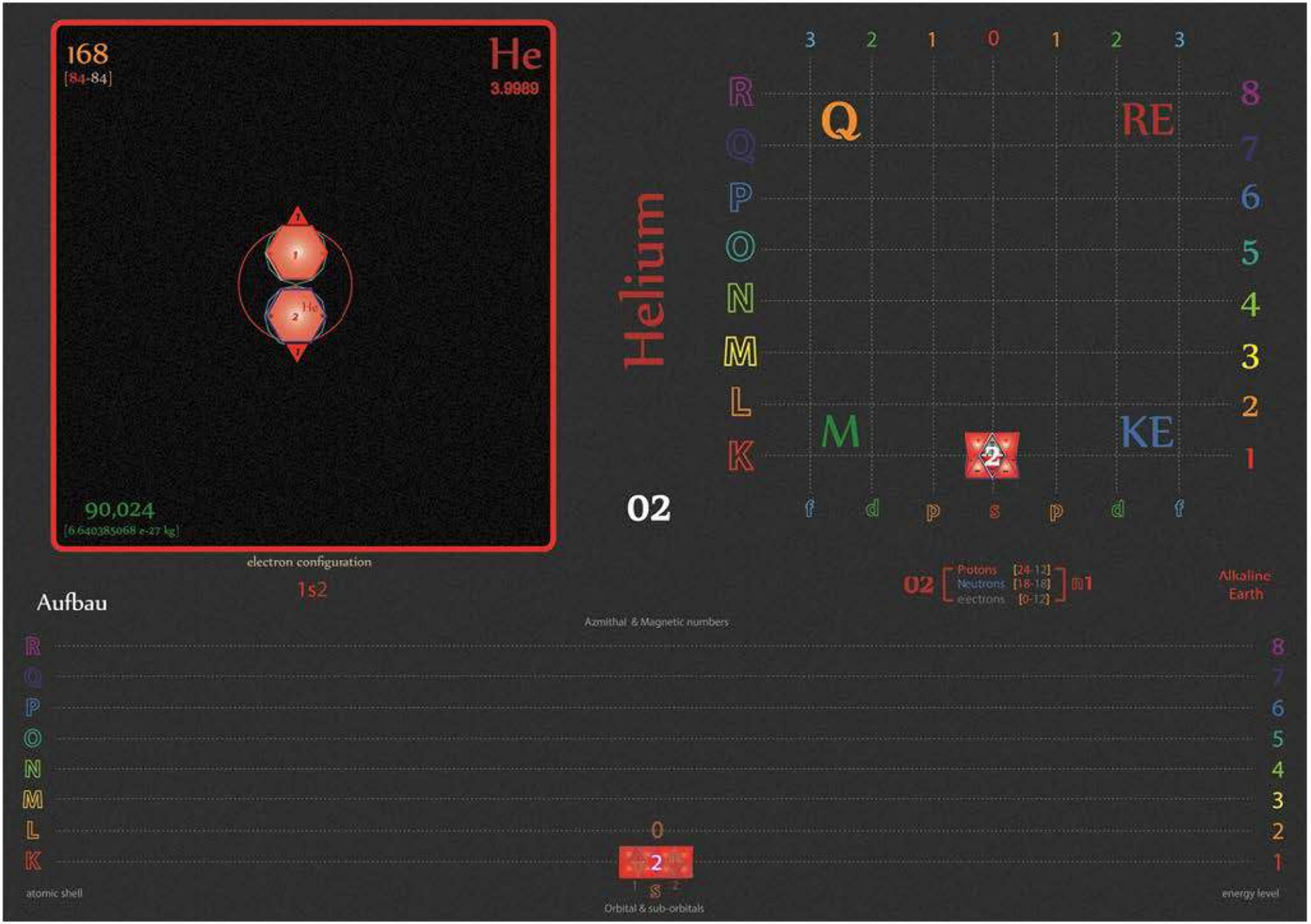

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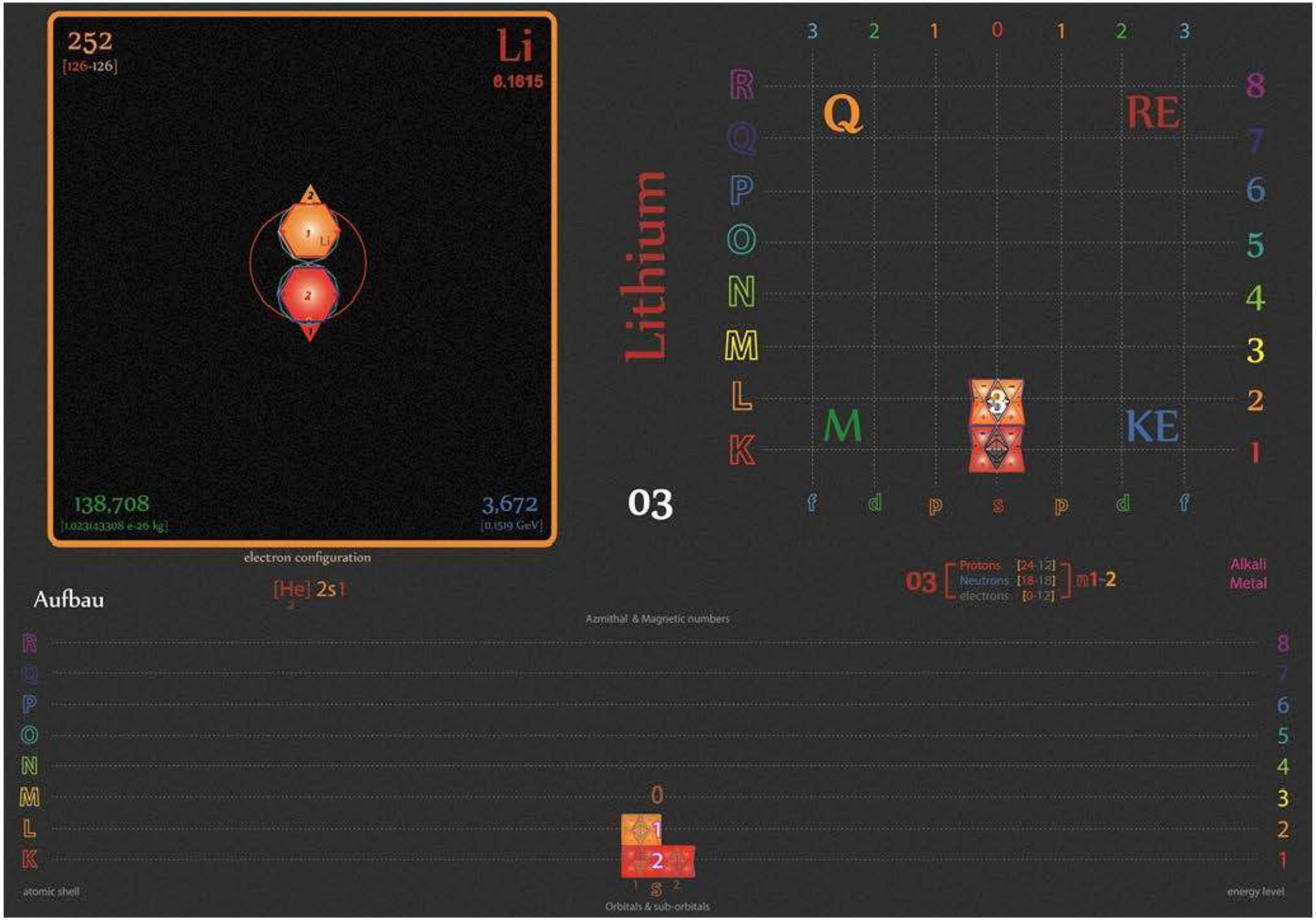

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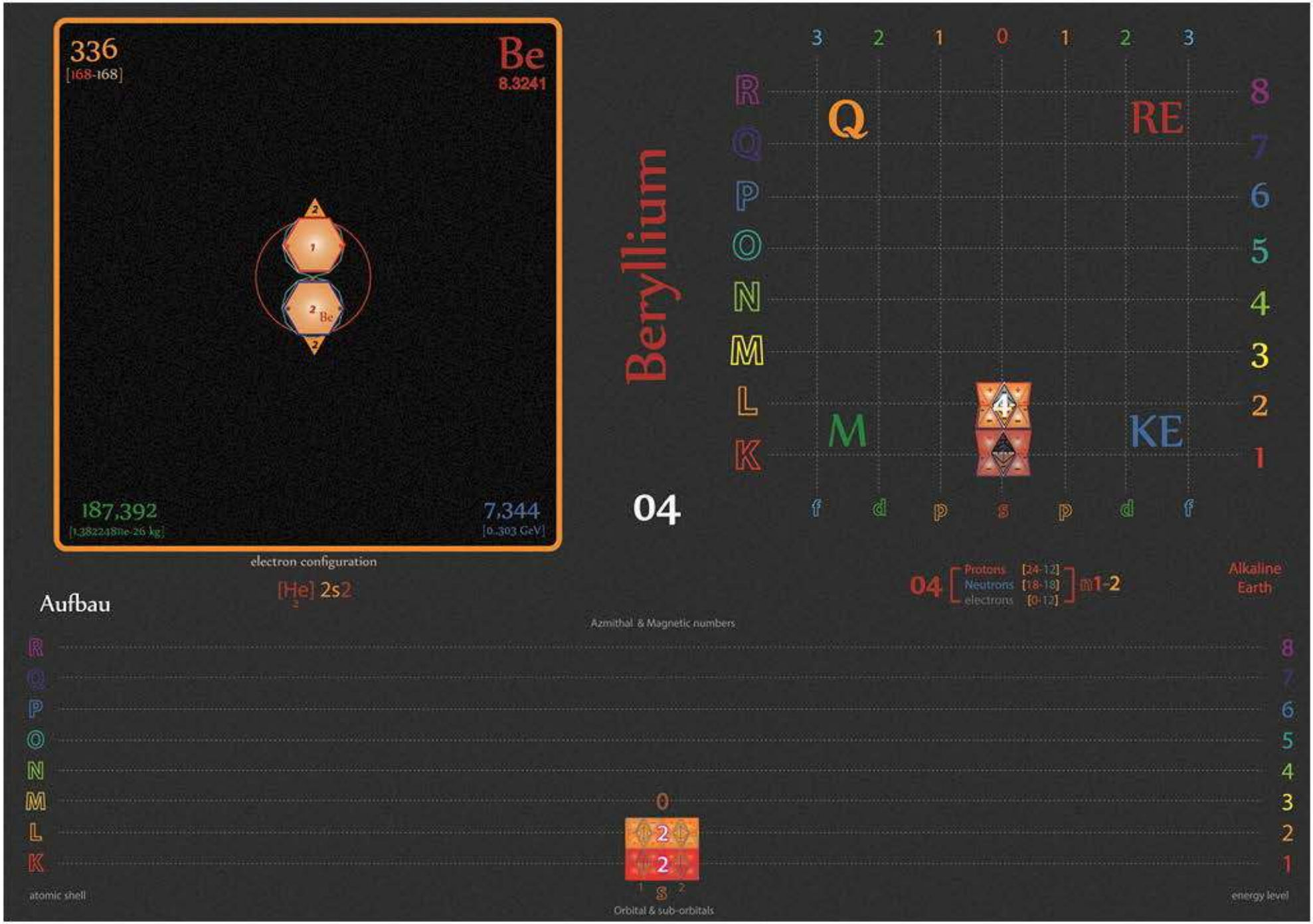

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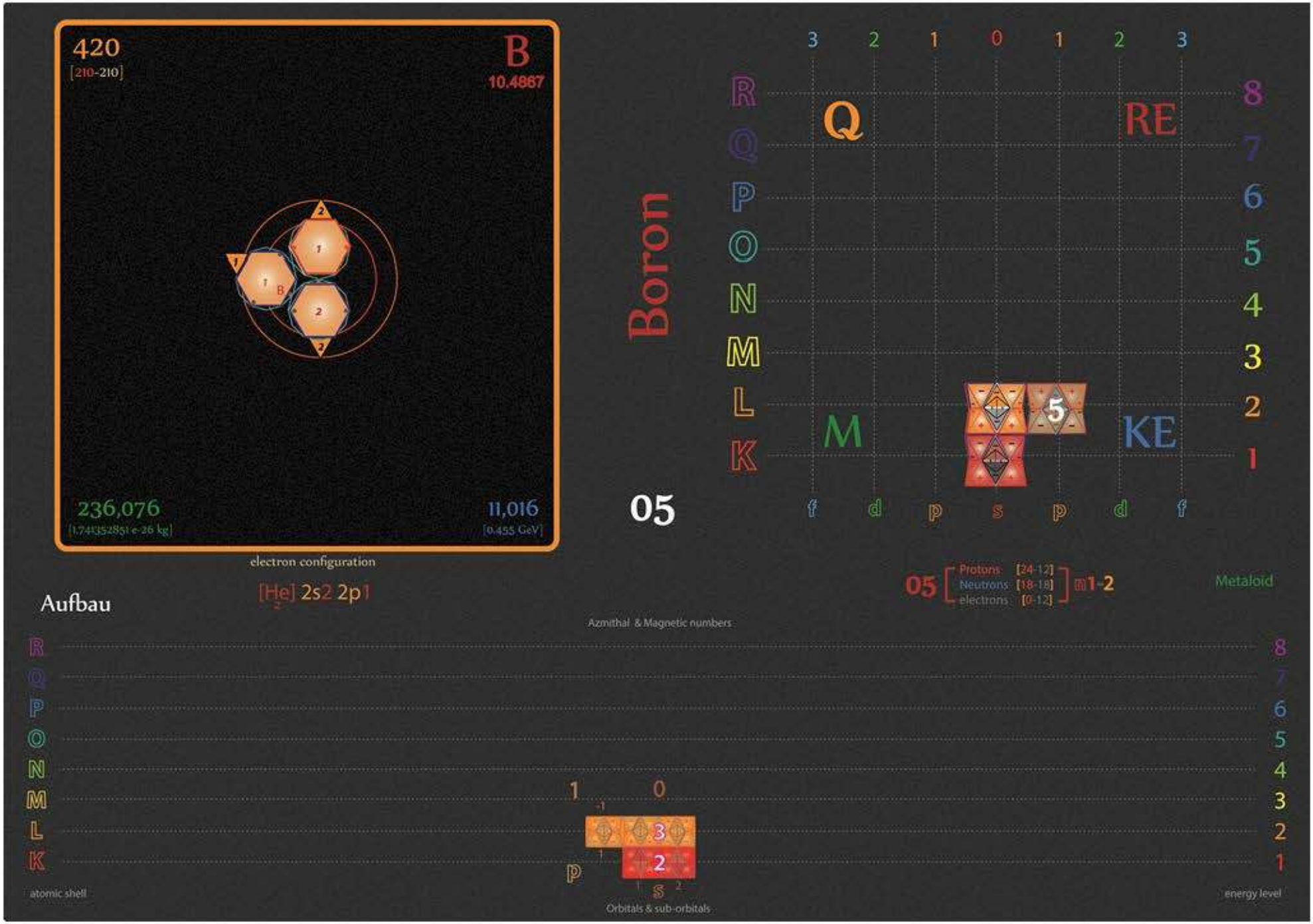

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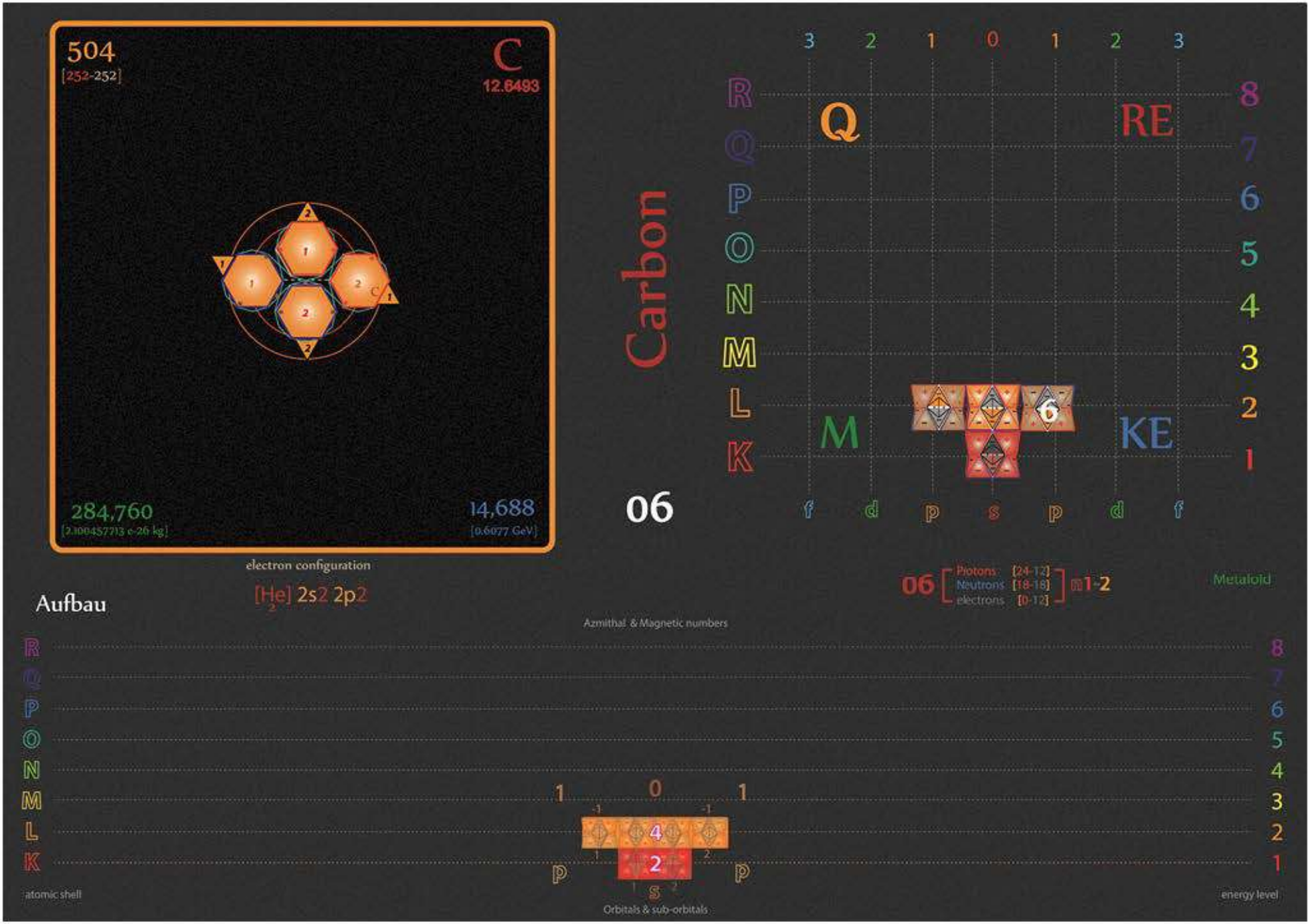

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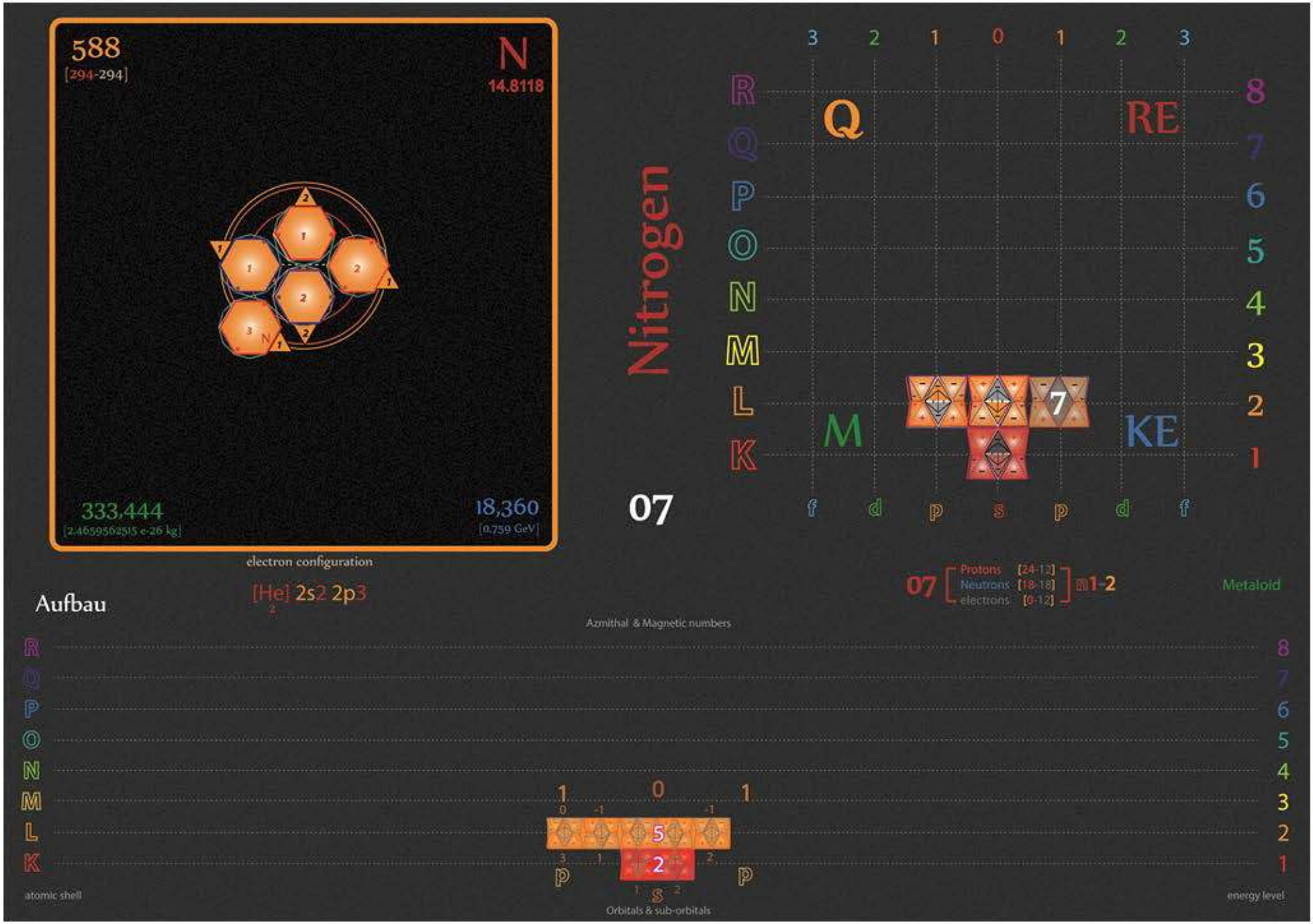

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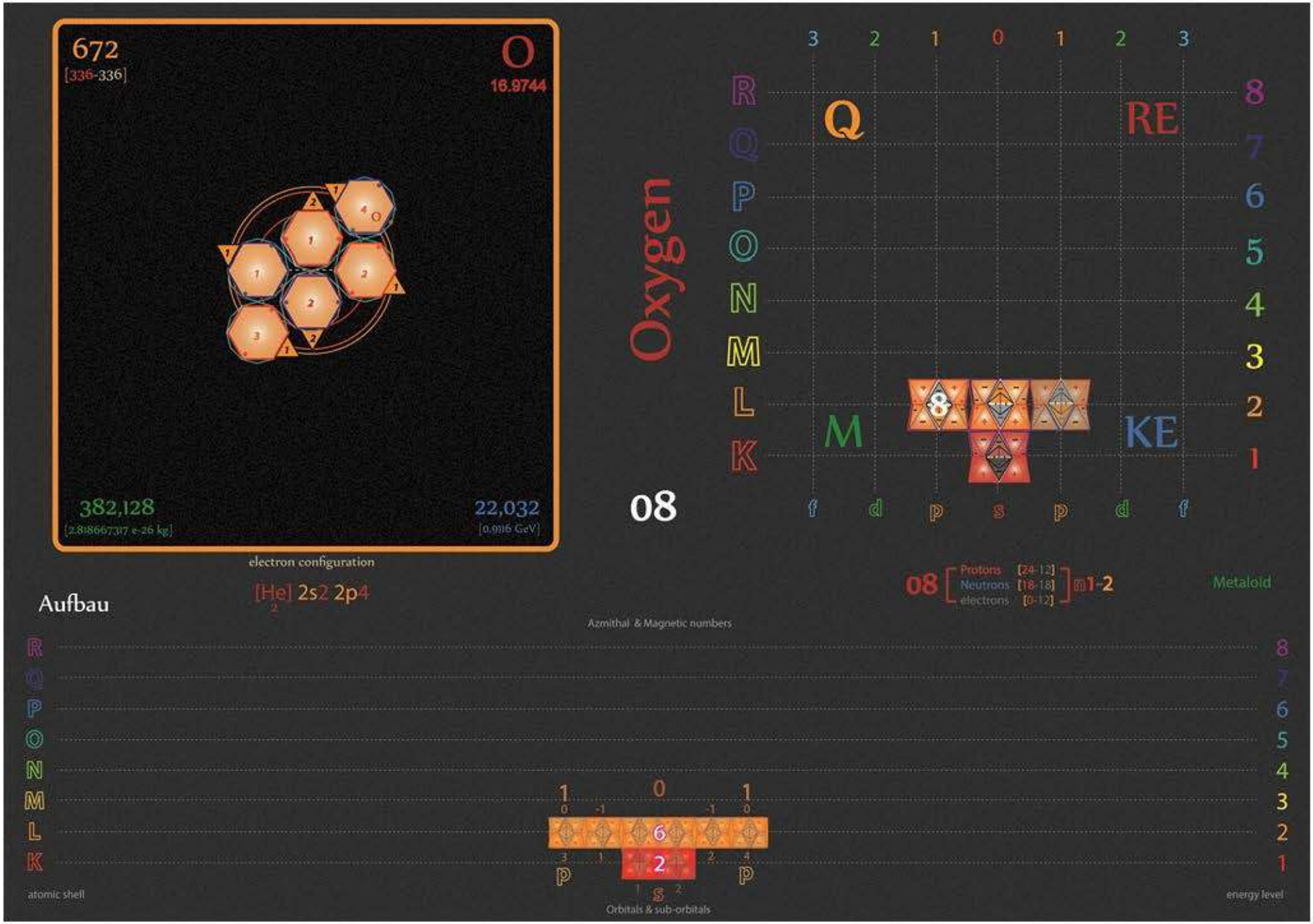

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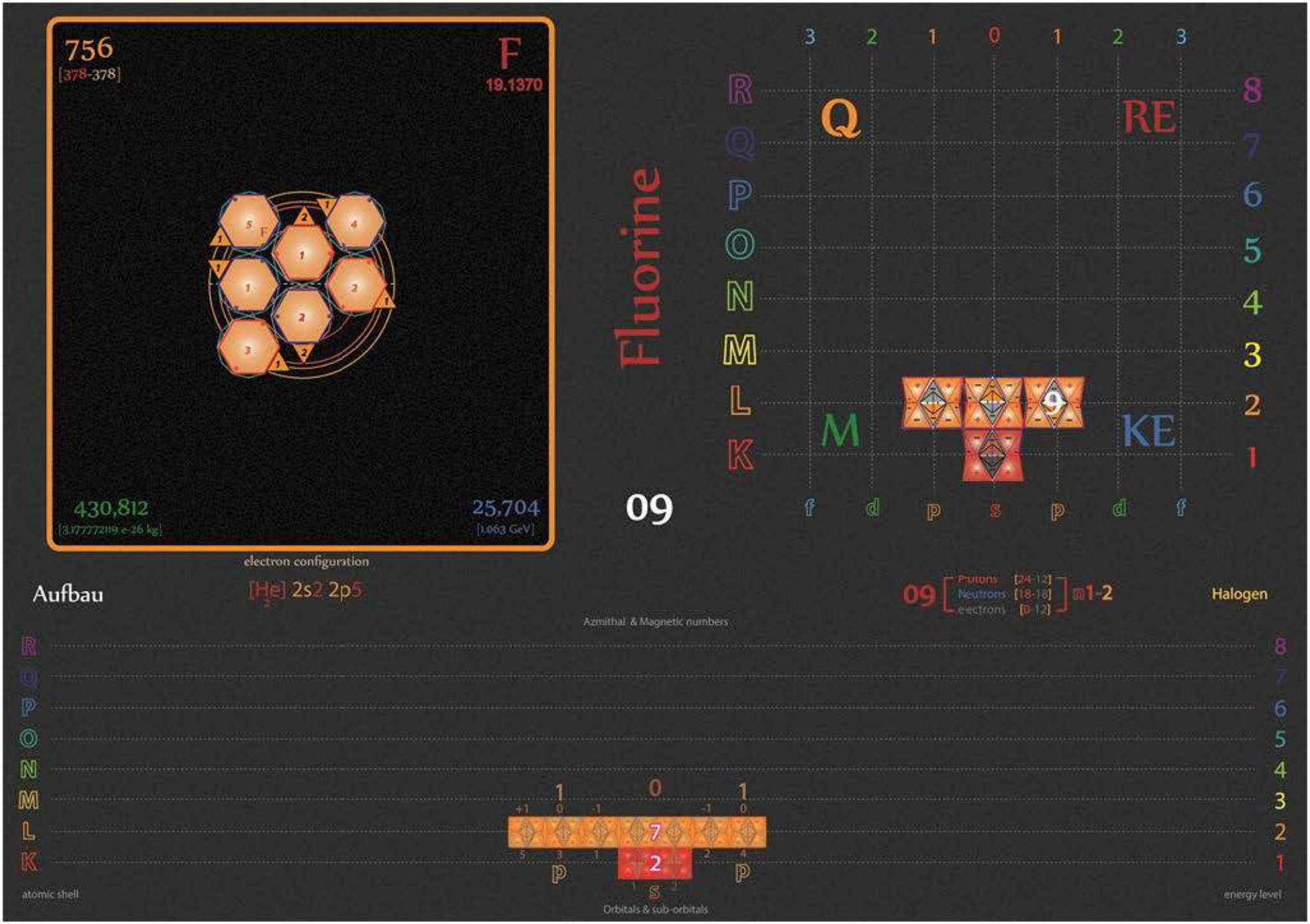

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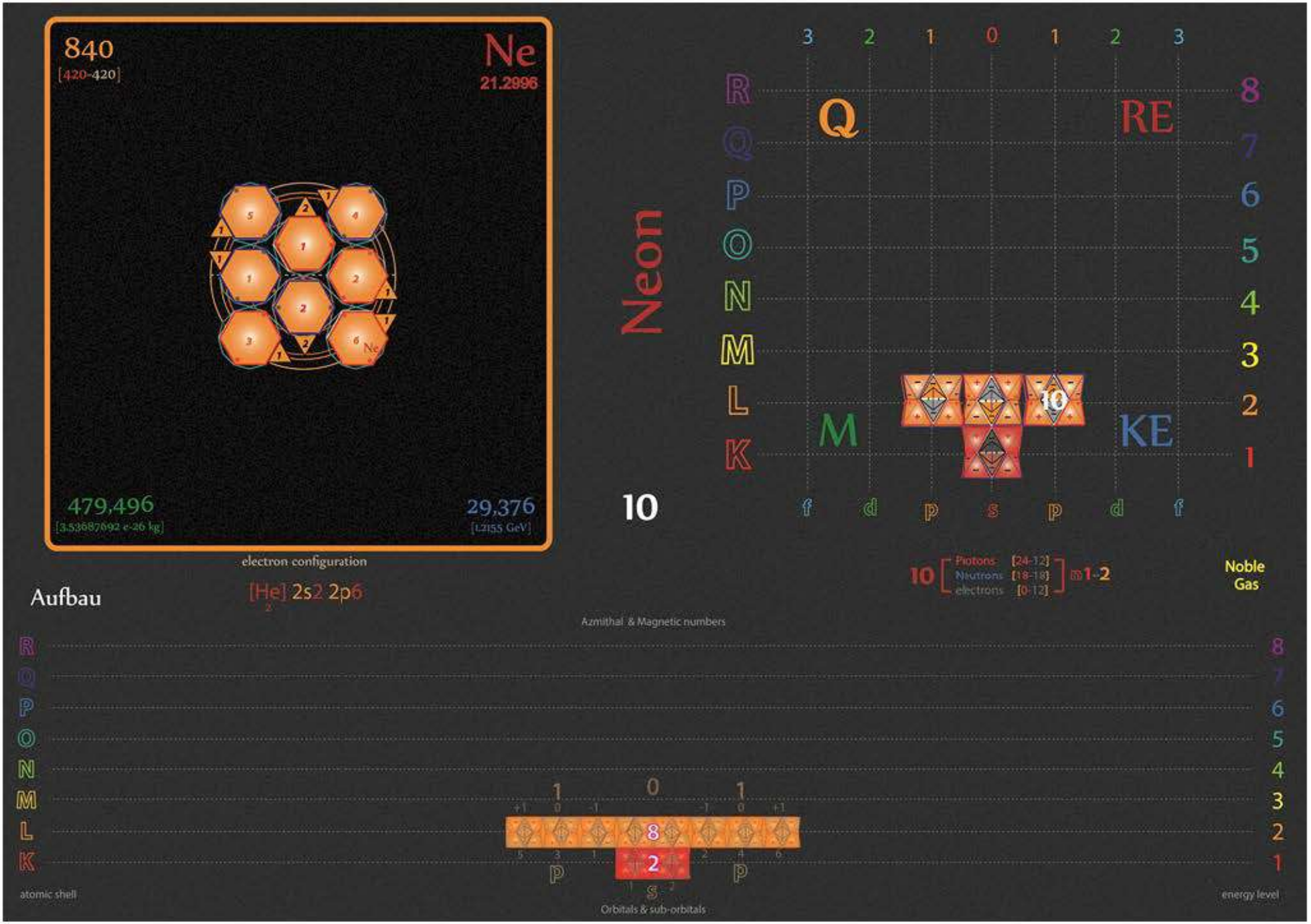

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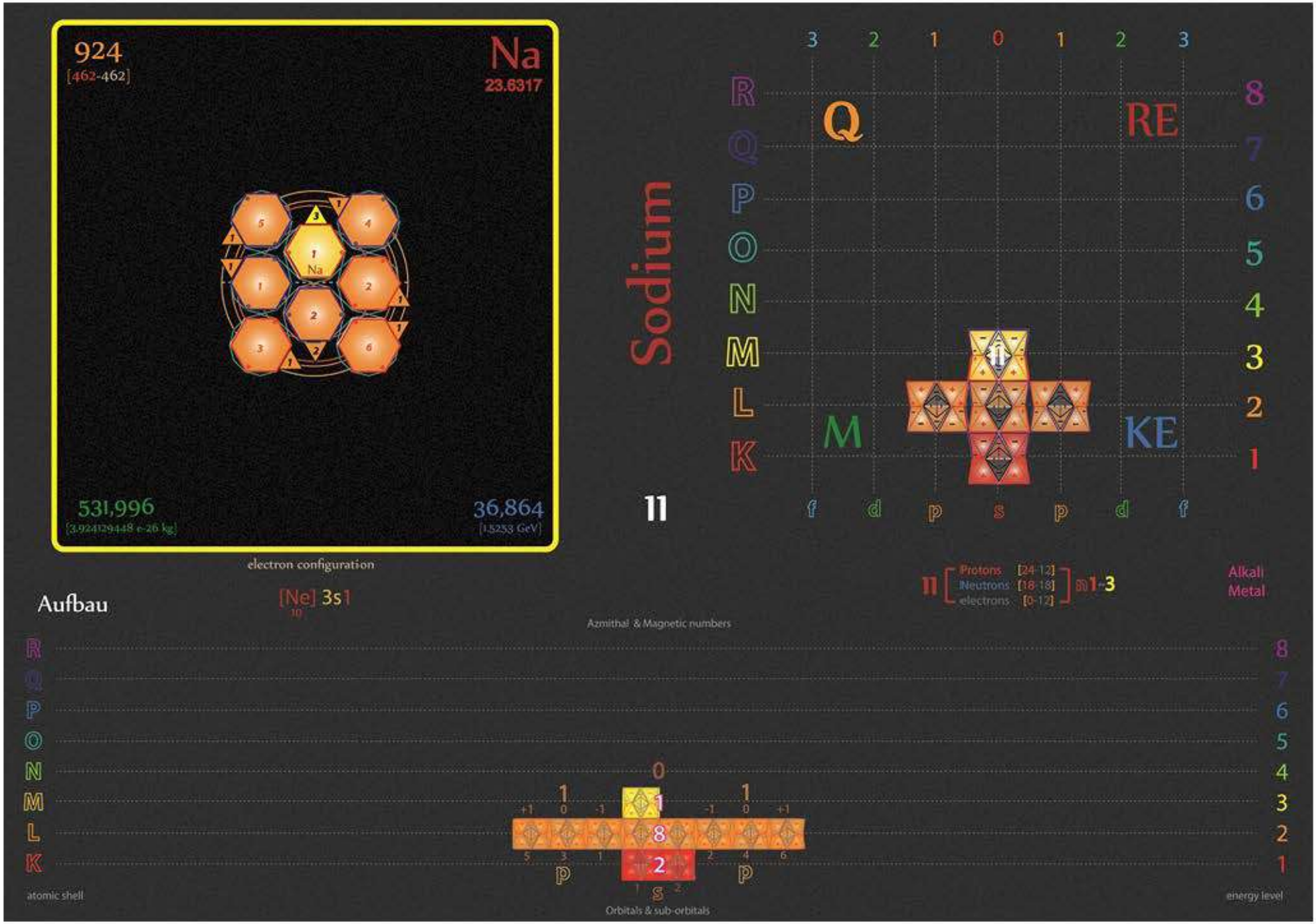

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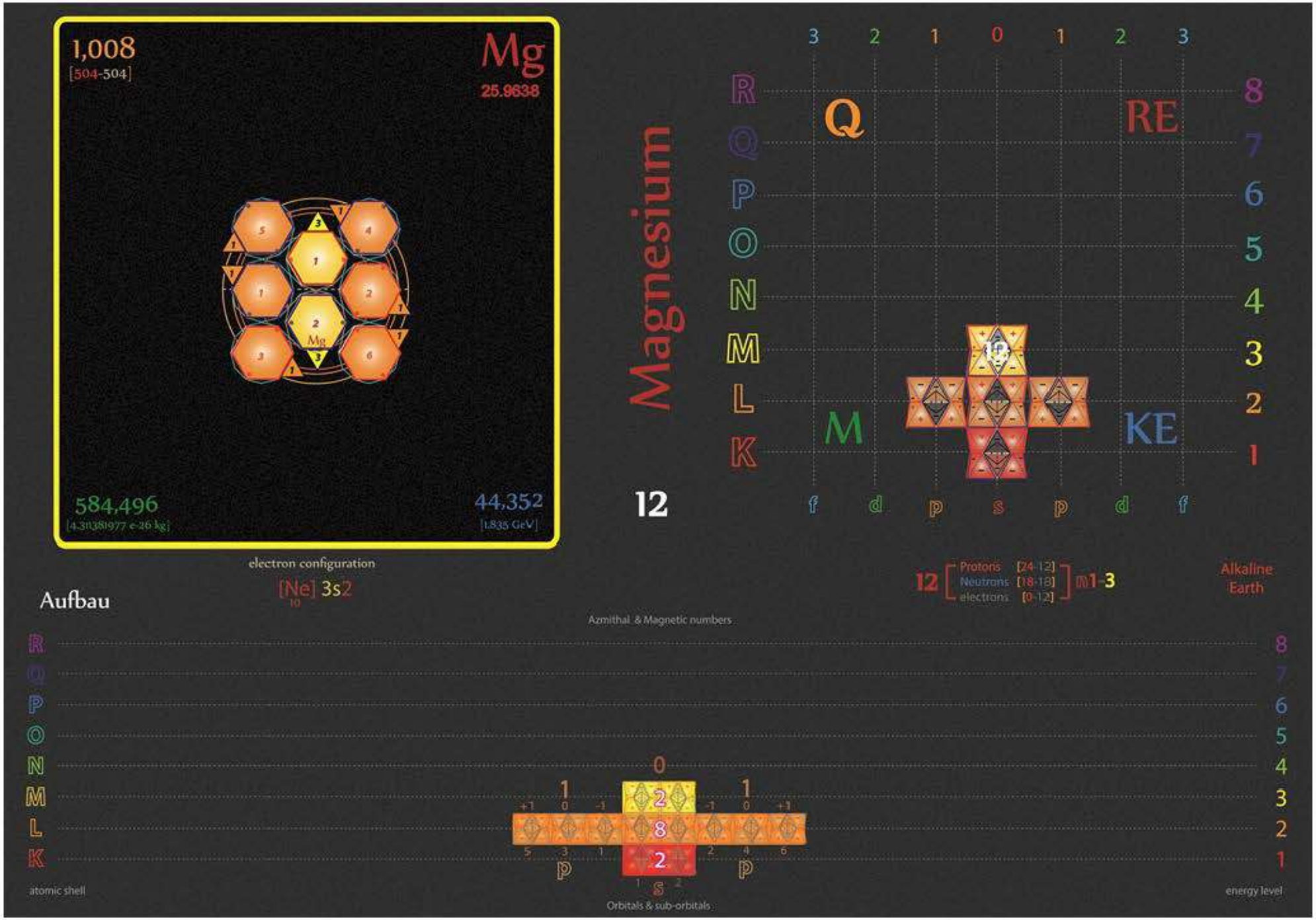

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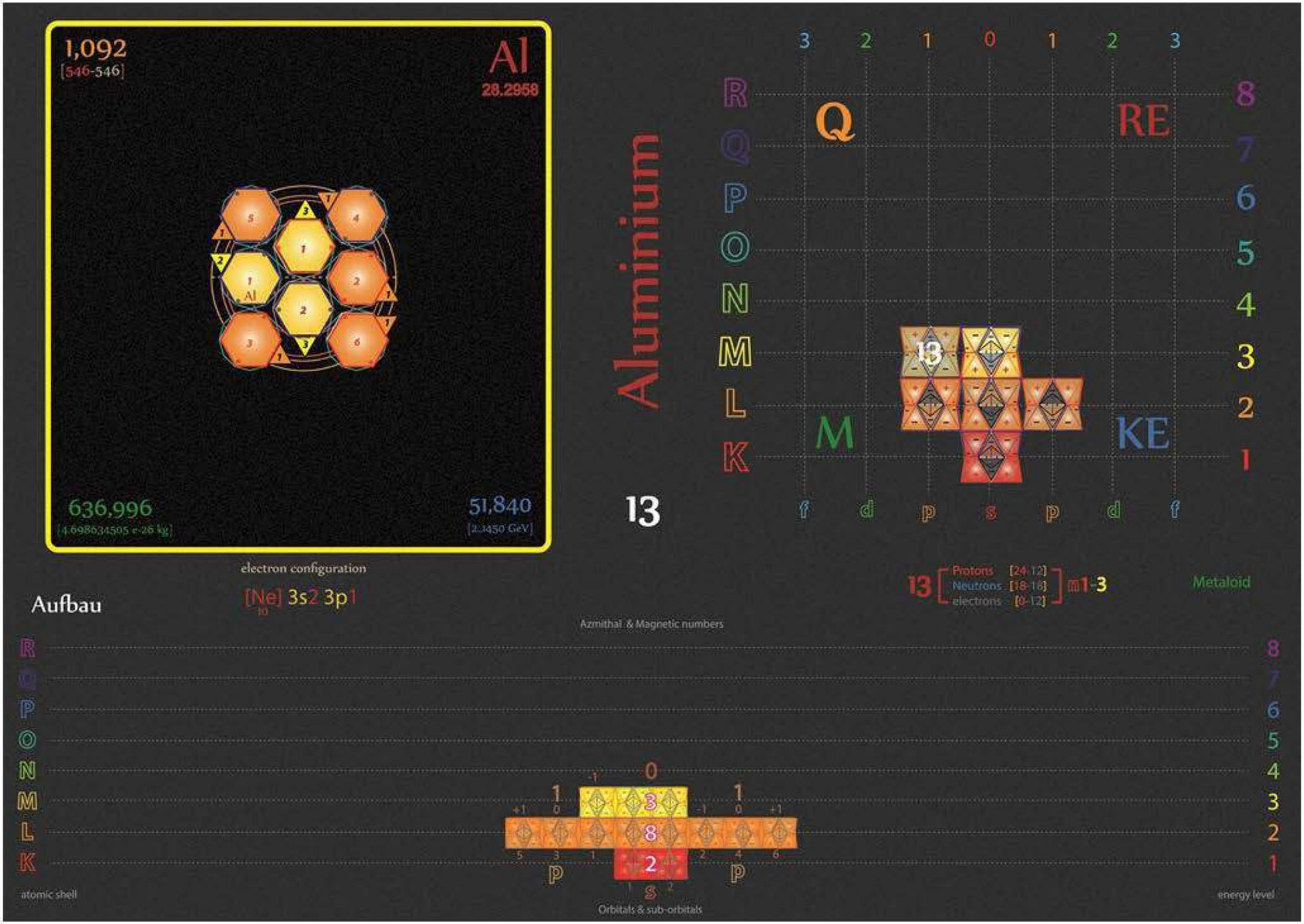

Tetryonics 51.13 - Aluminium atom

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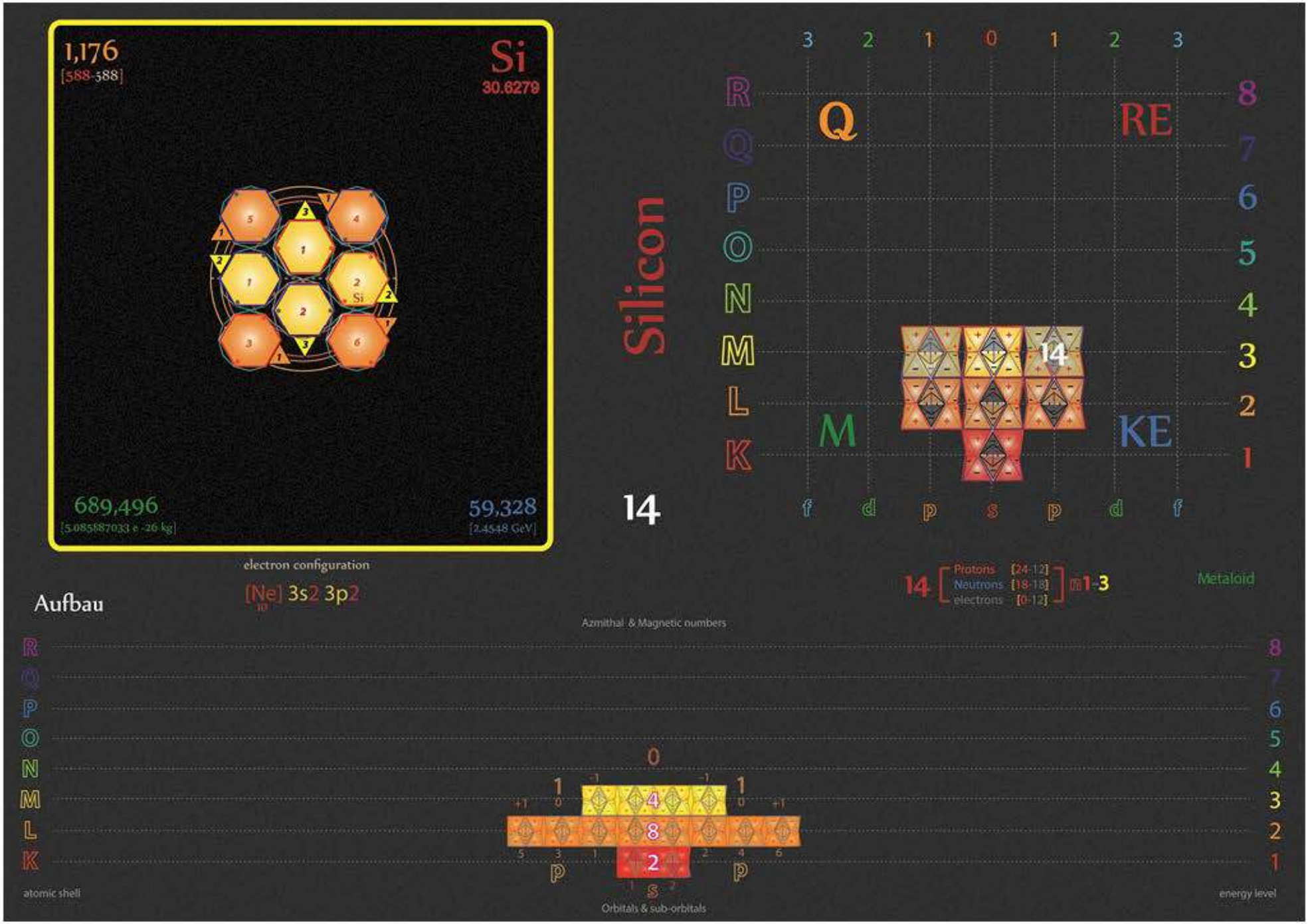

Tetryonics 51.14 - Silicon atom

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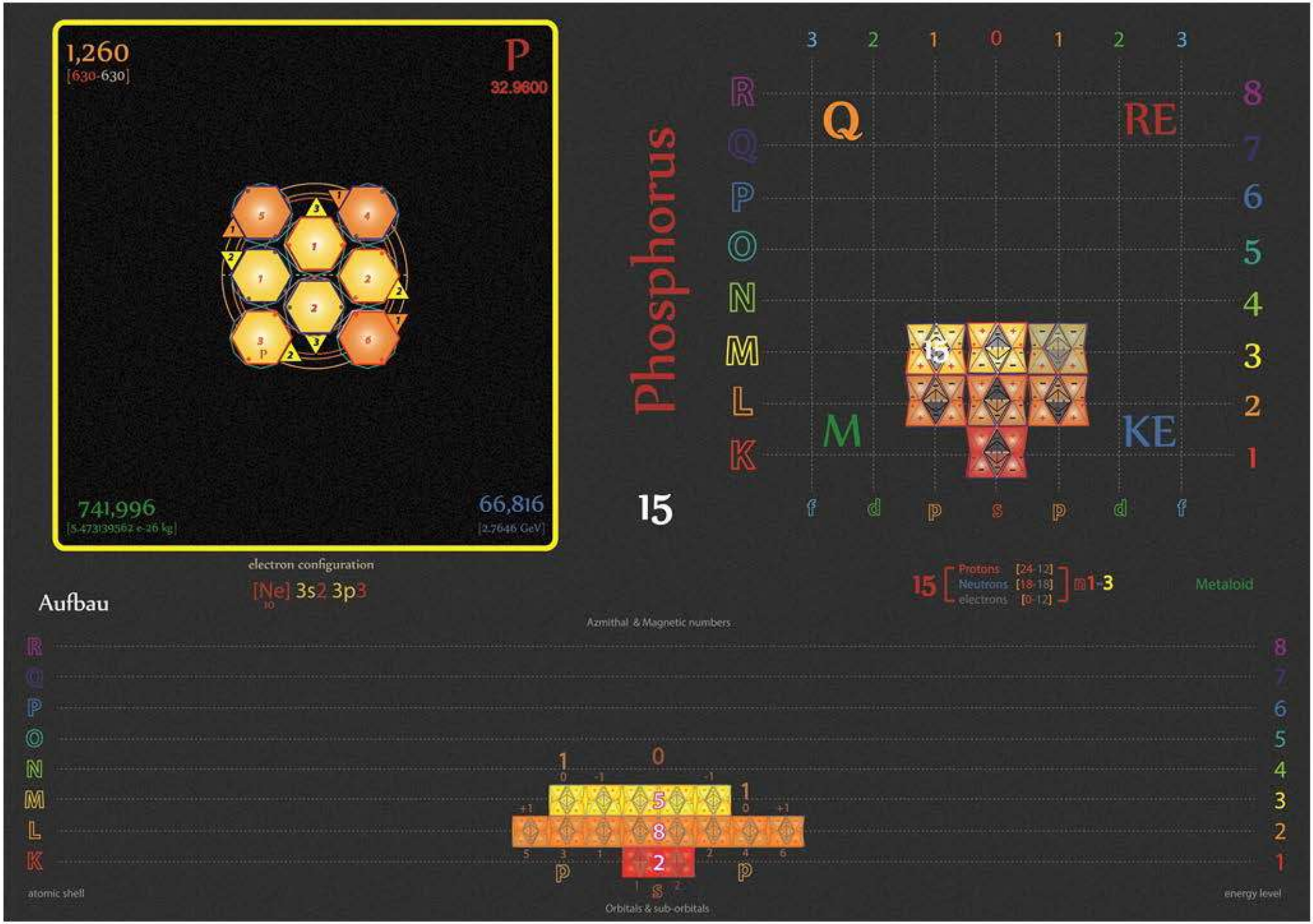

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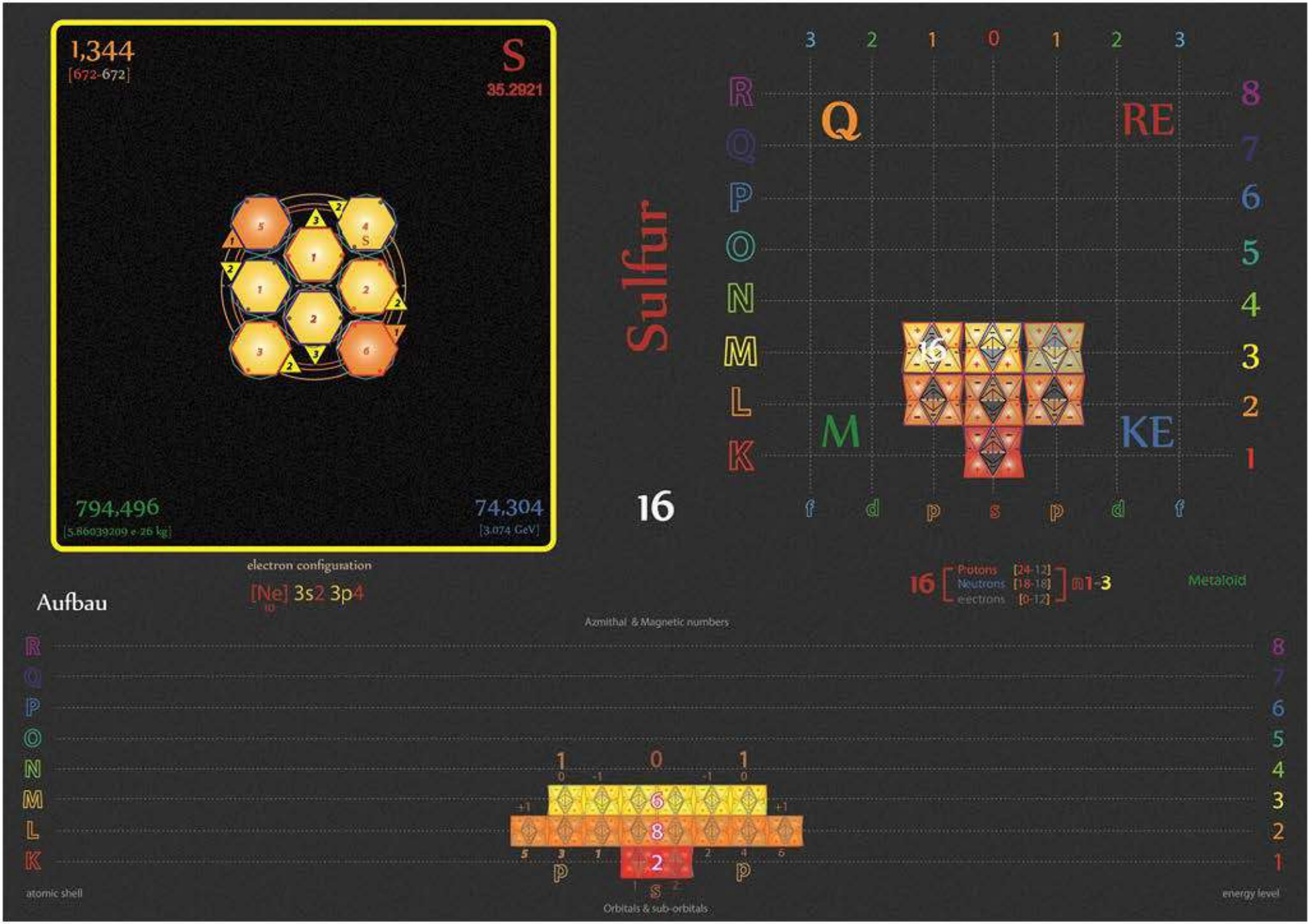

Tetryonics 51.16 - Sulfur atom

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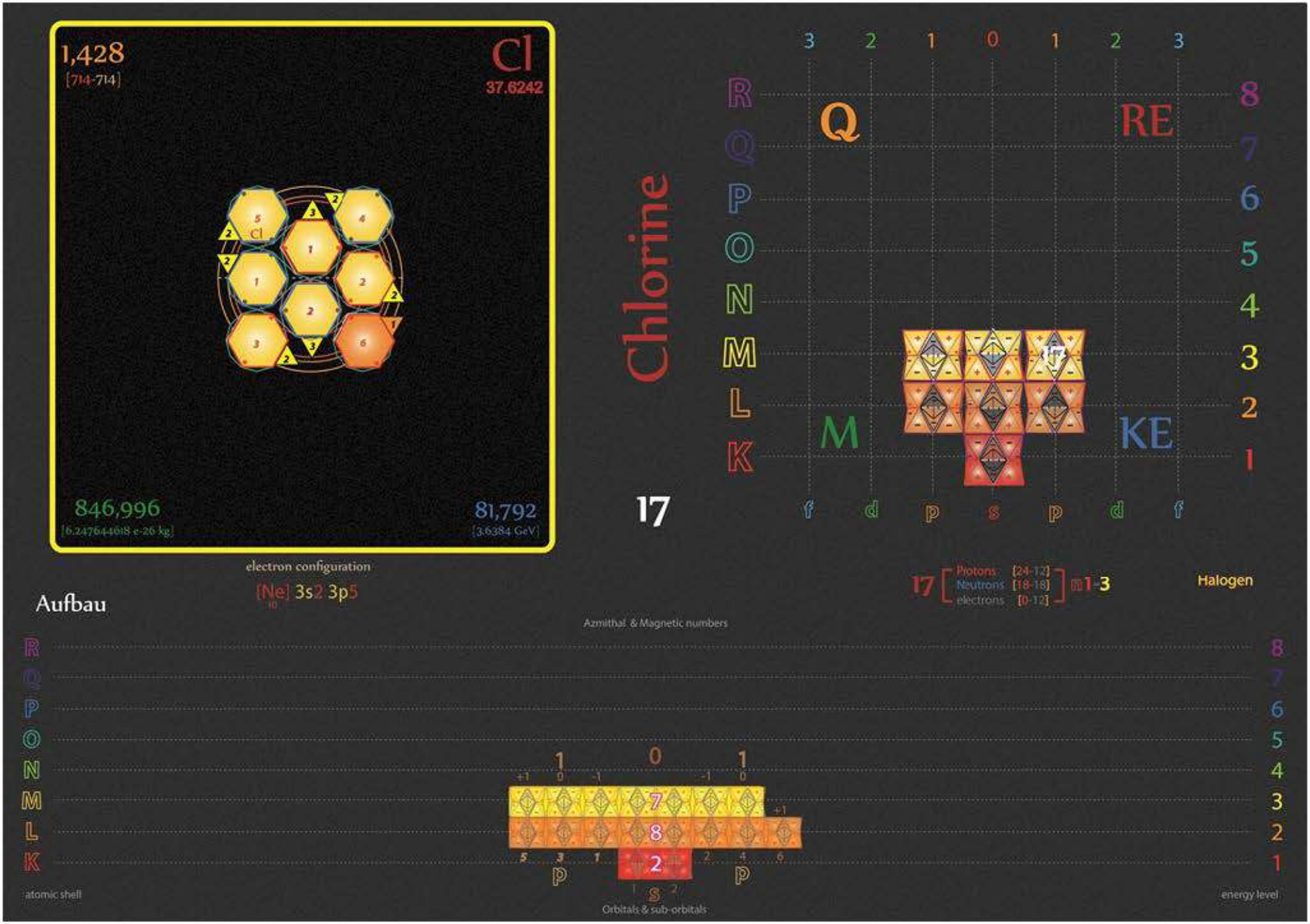

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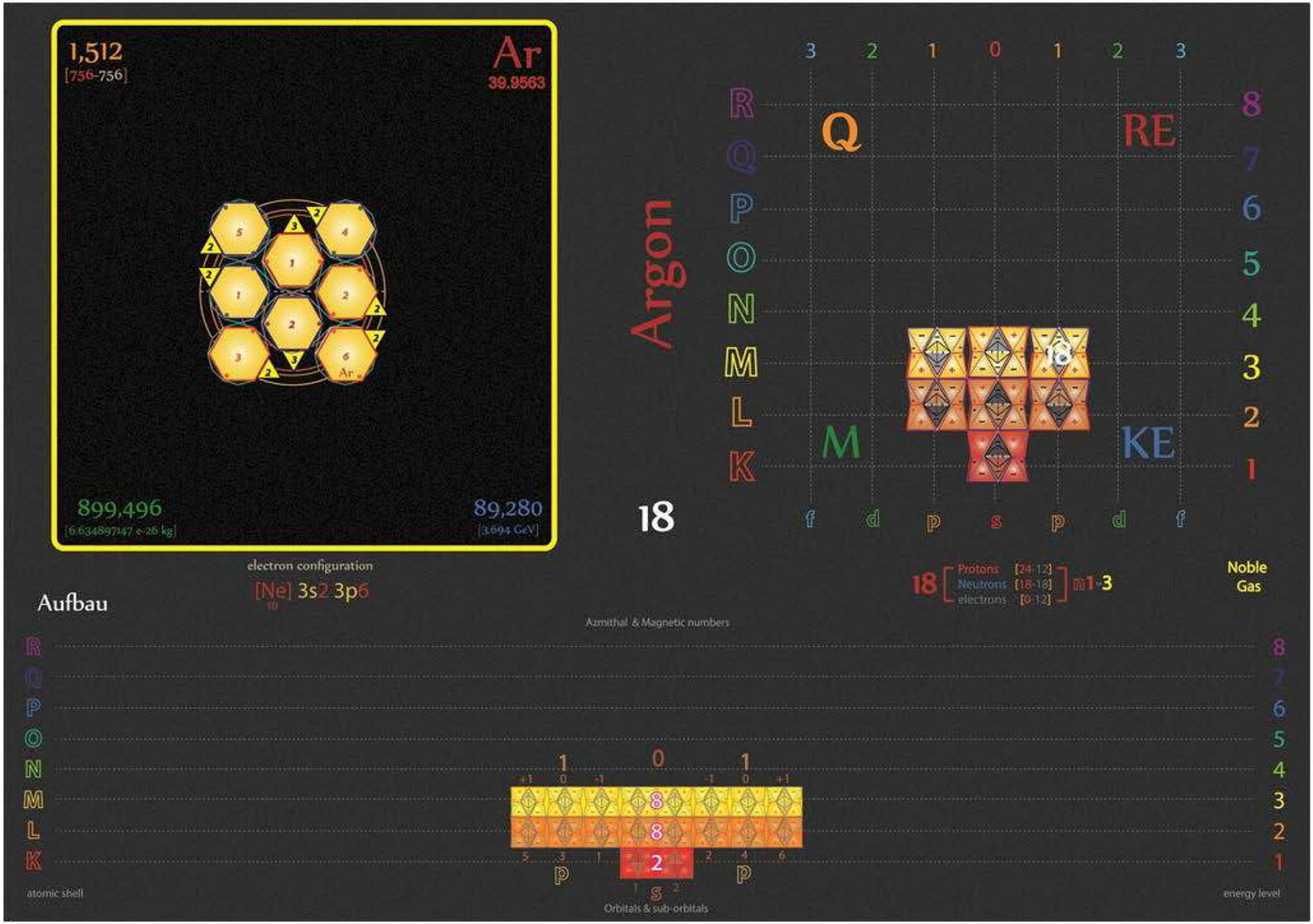

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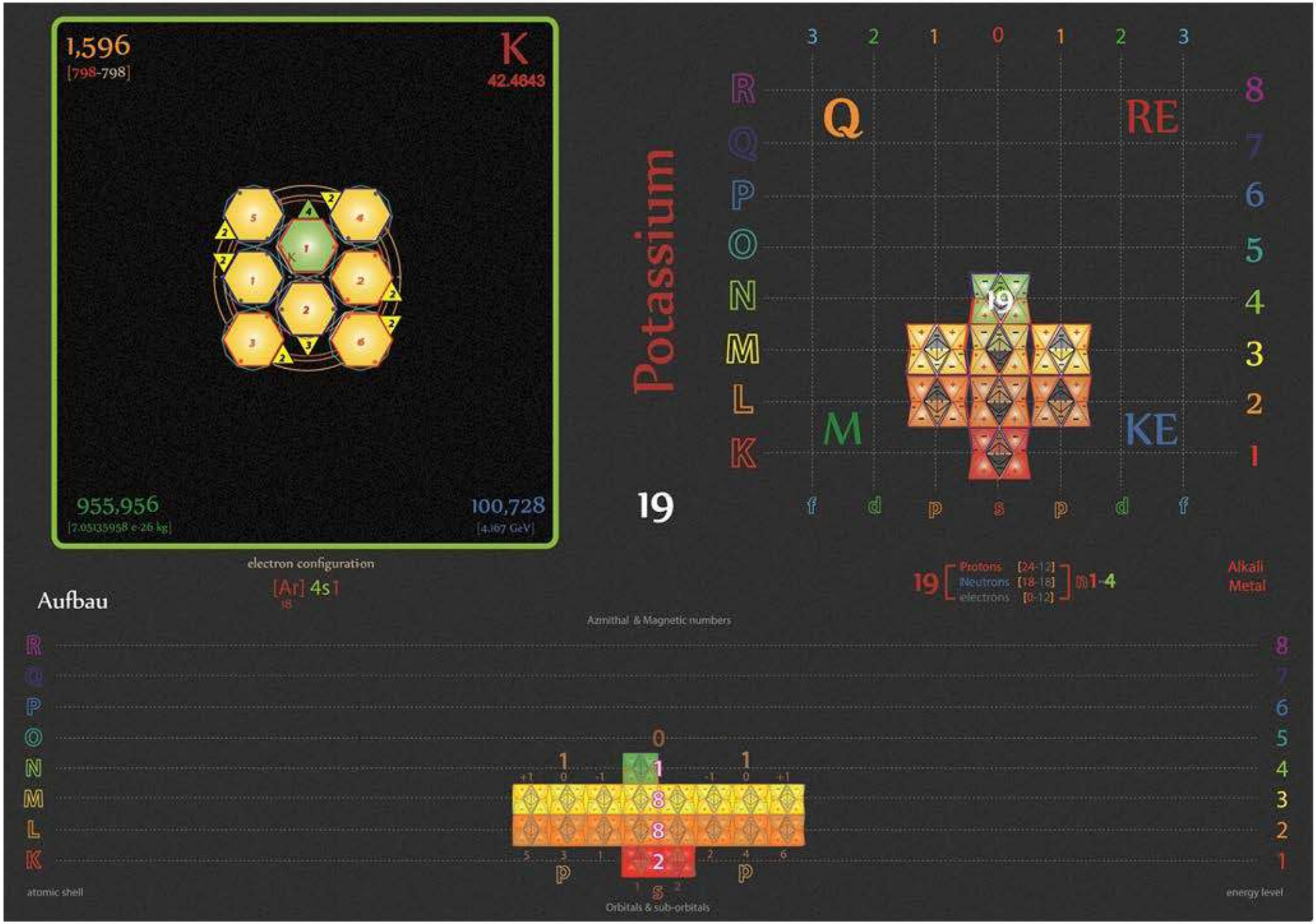

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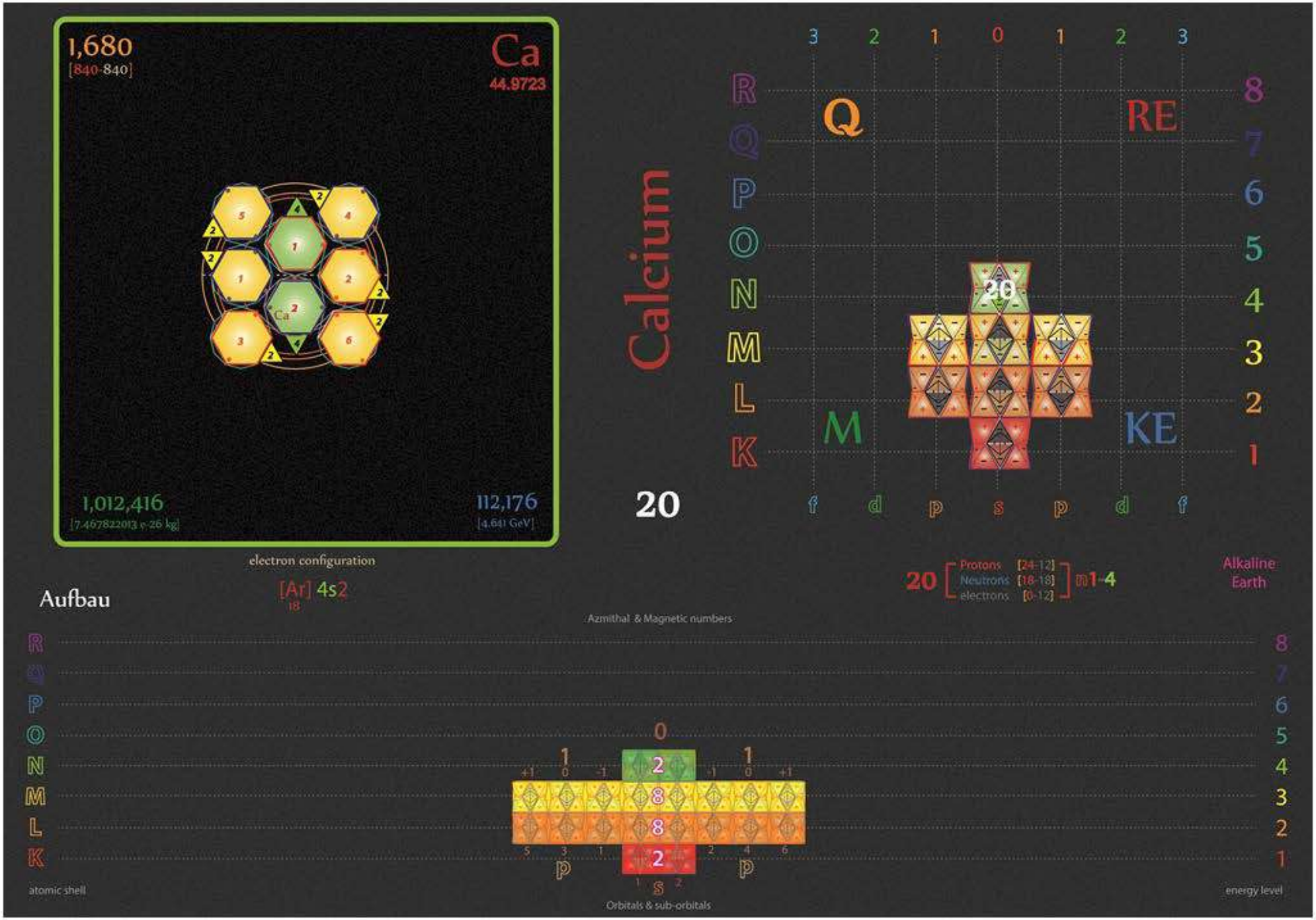

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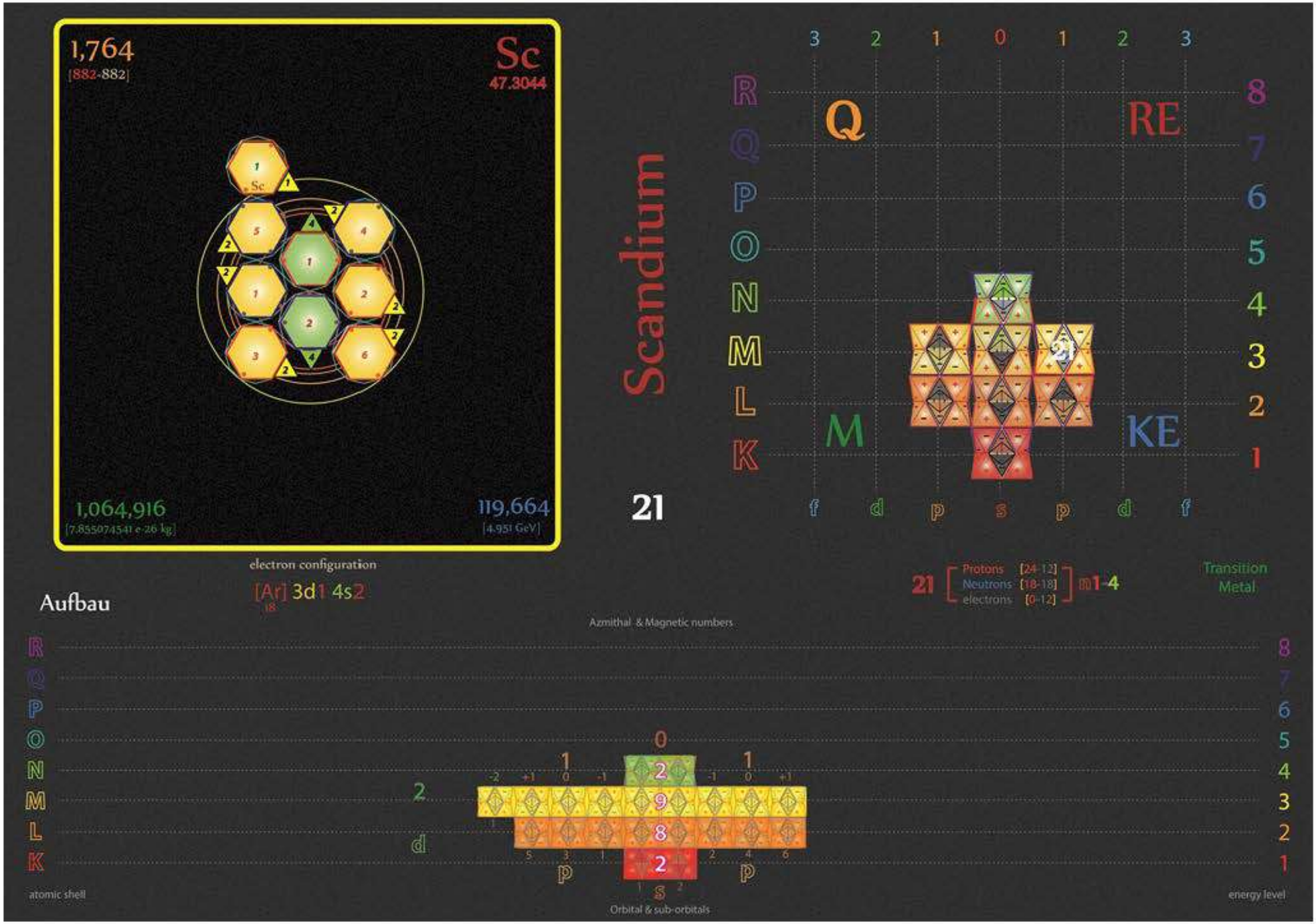

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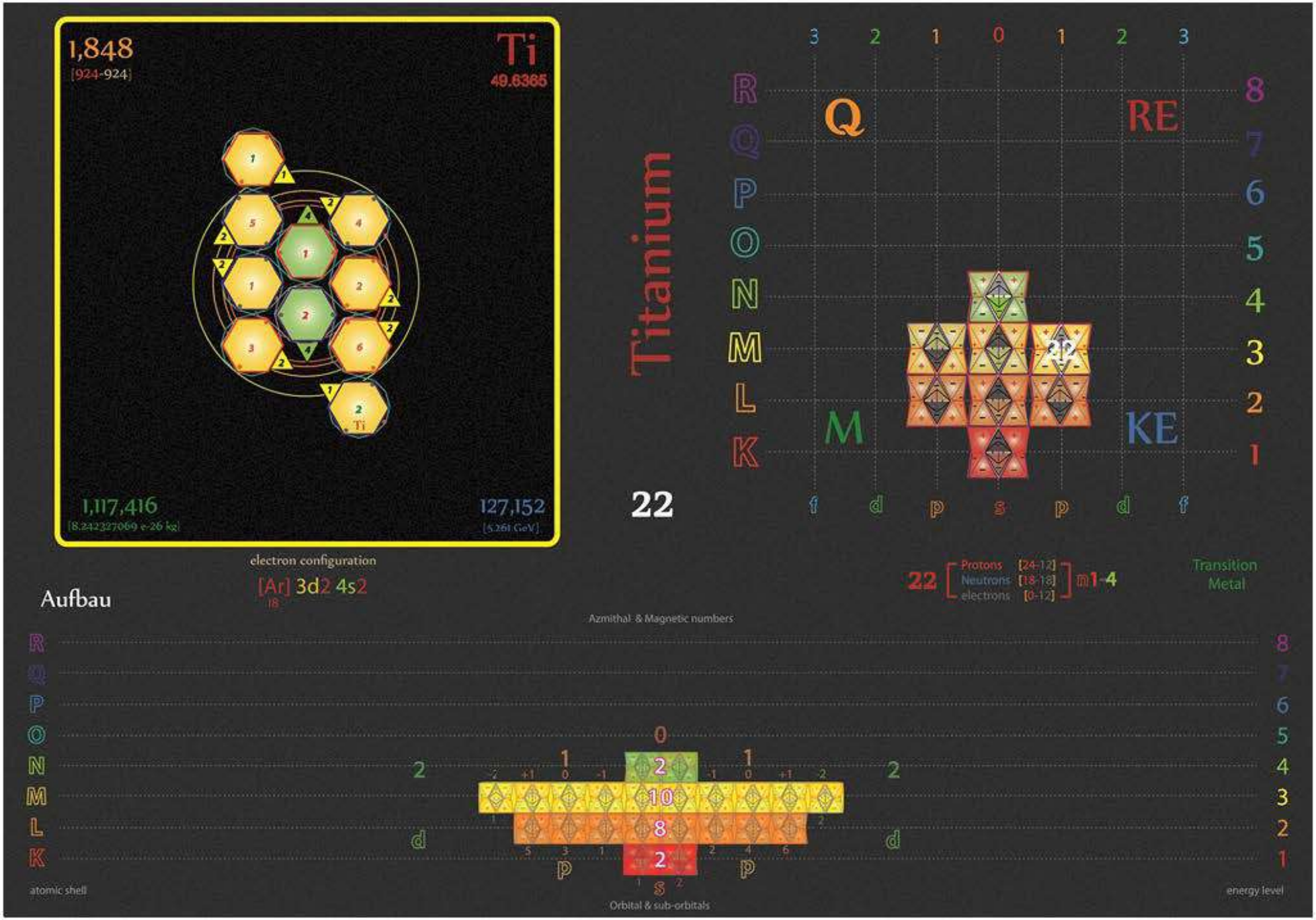

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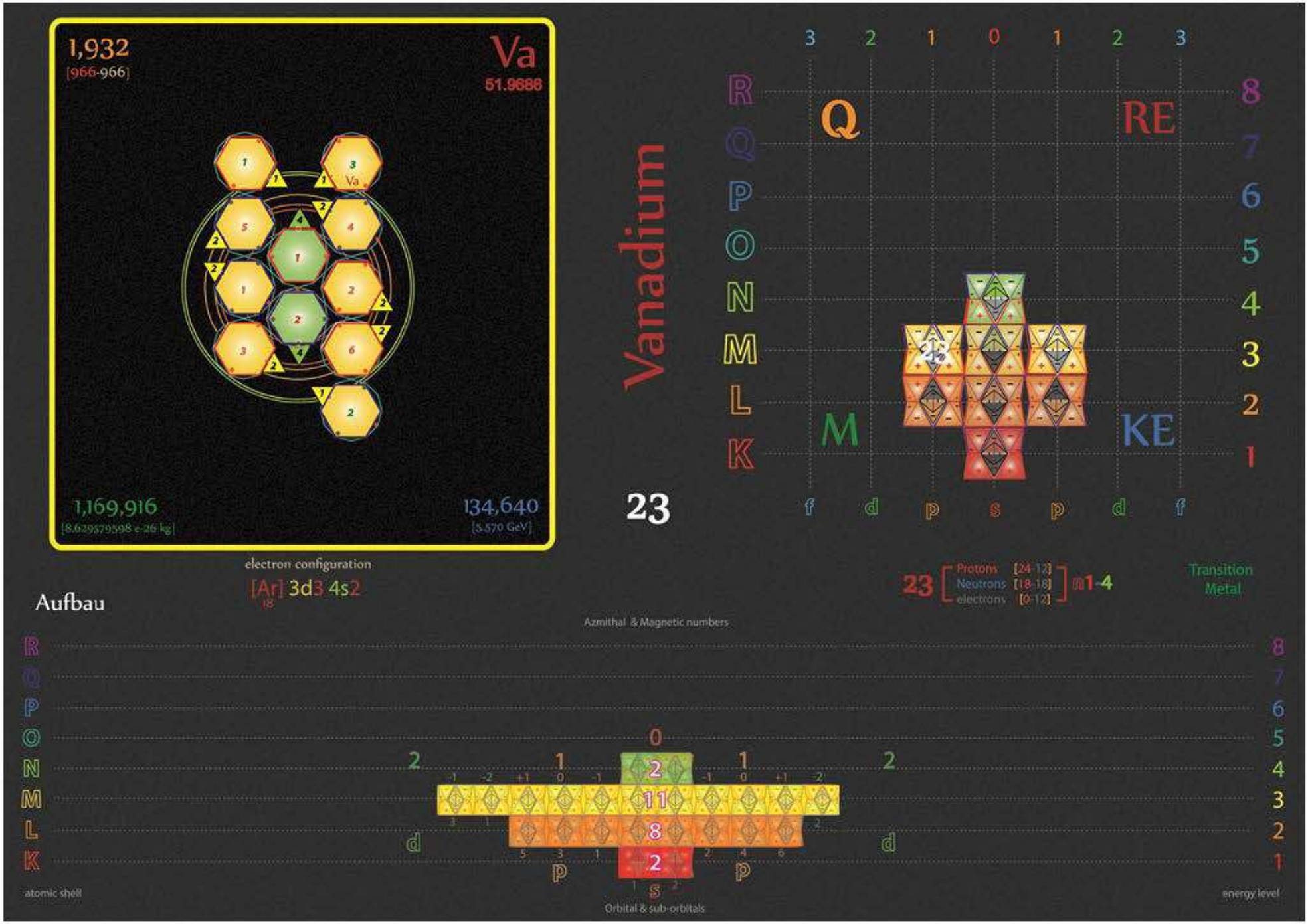

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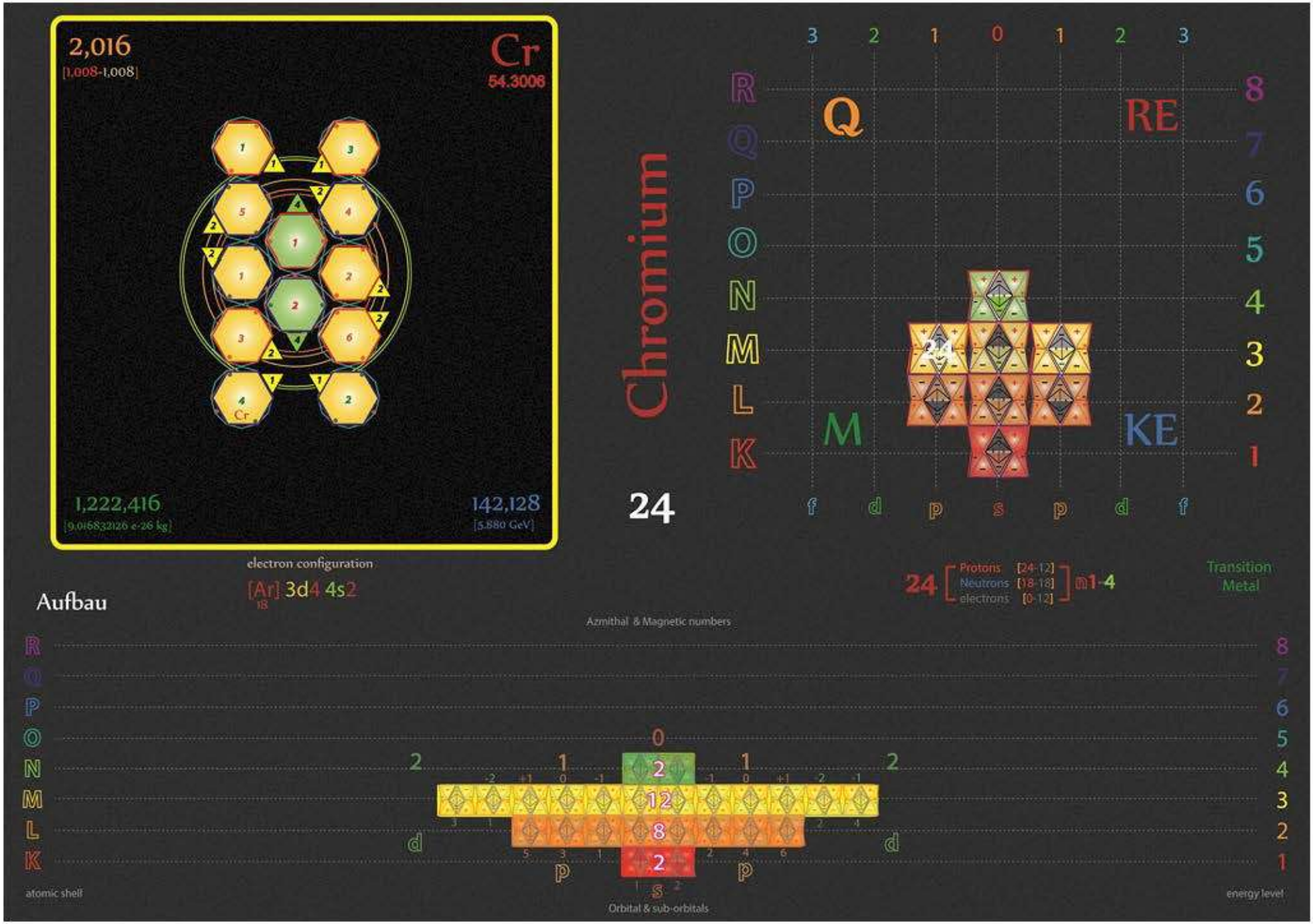

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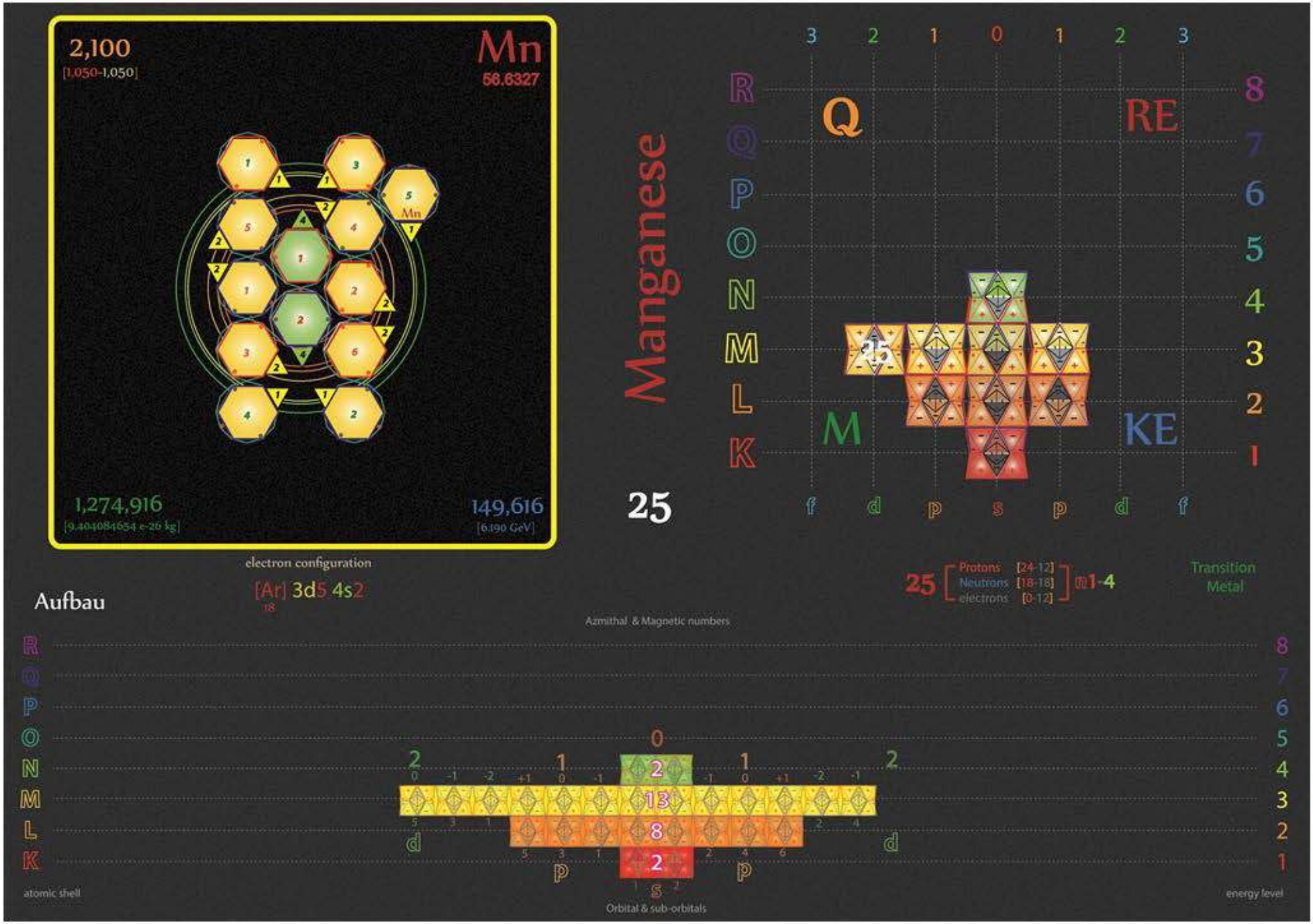

Tetryonics 51.25 - Manganese atom

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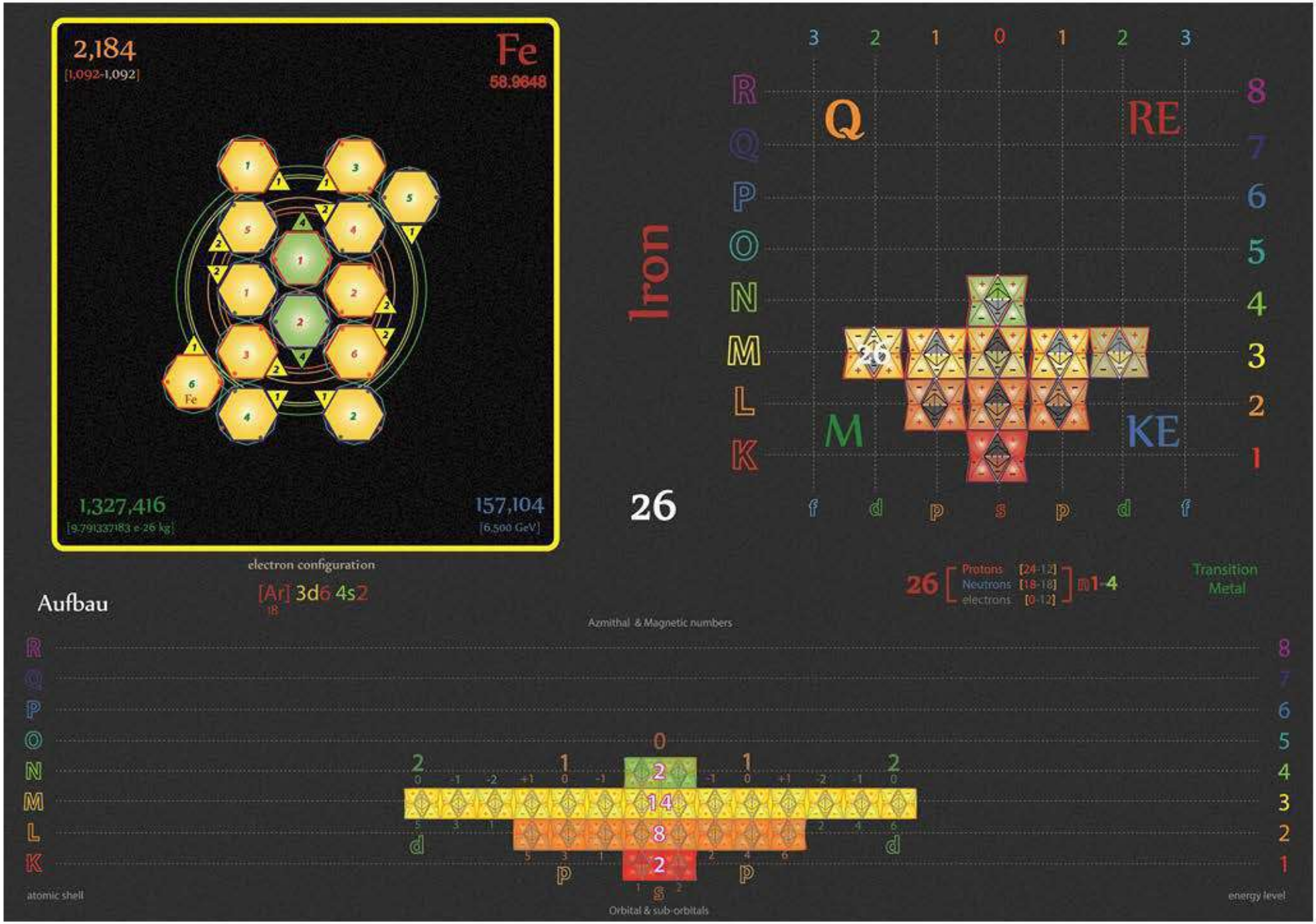

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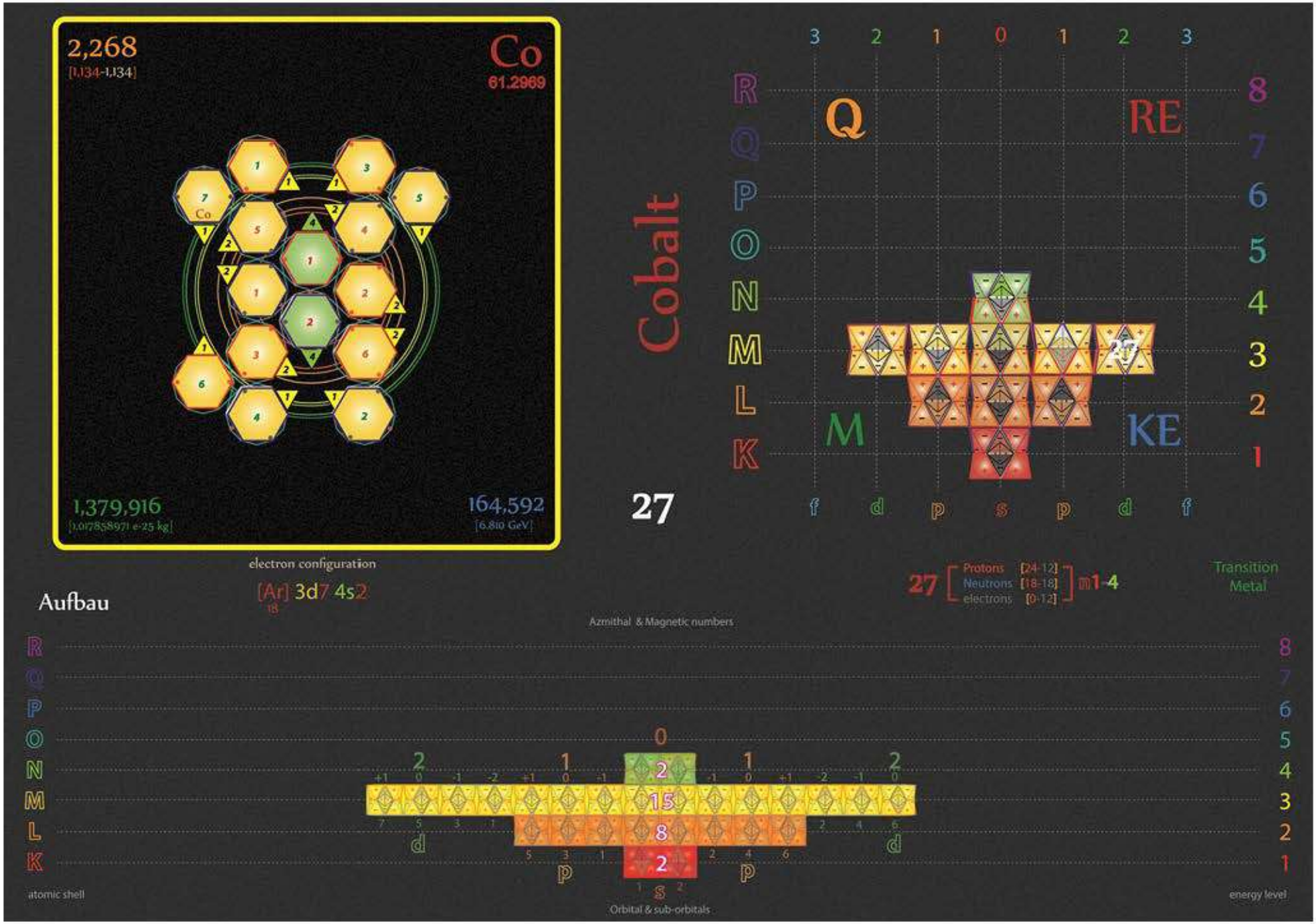

Tetryonics 51.27 - Cobalt atom

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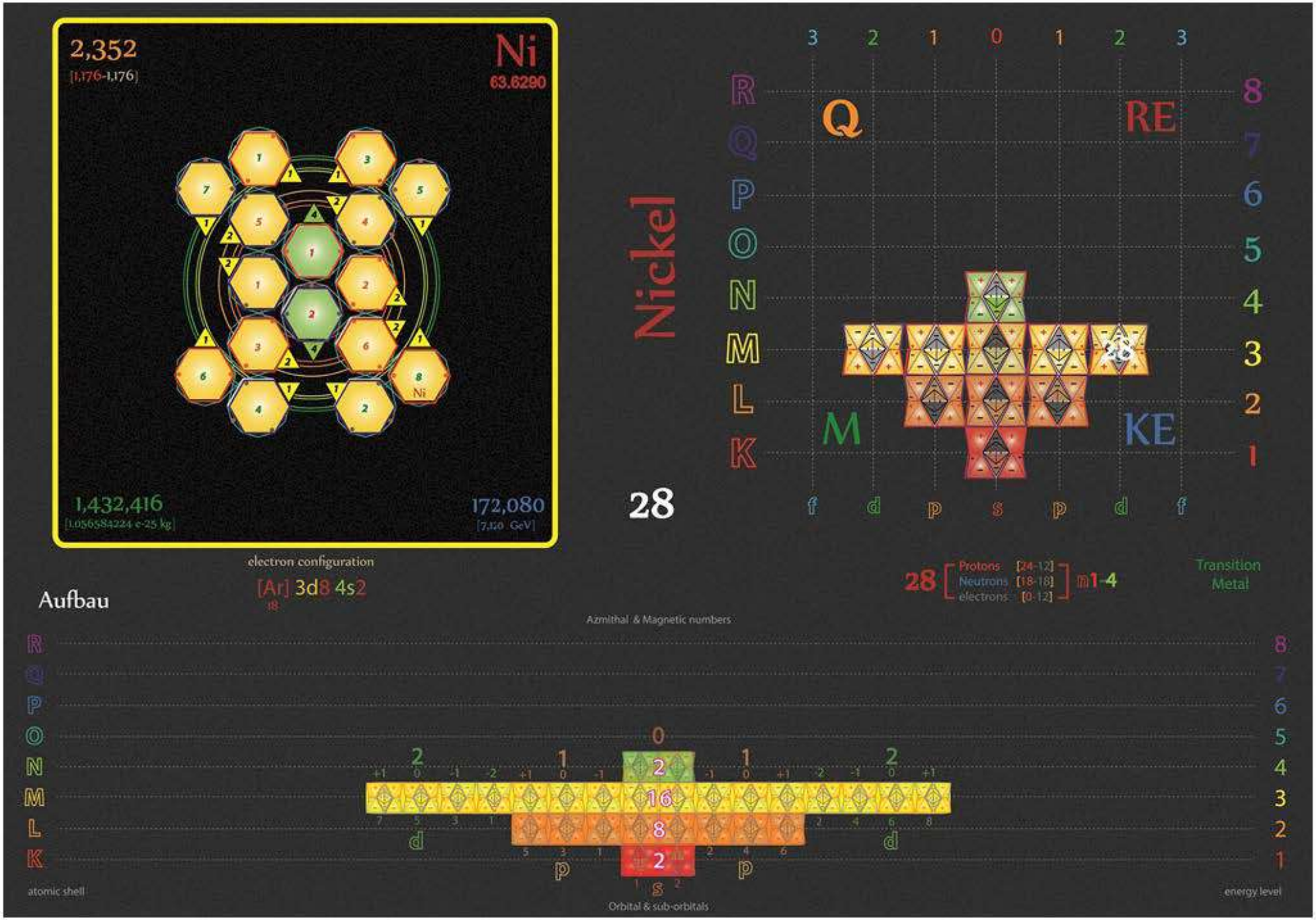

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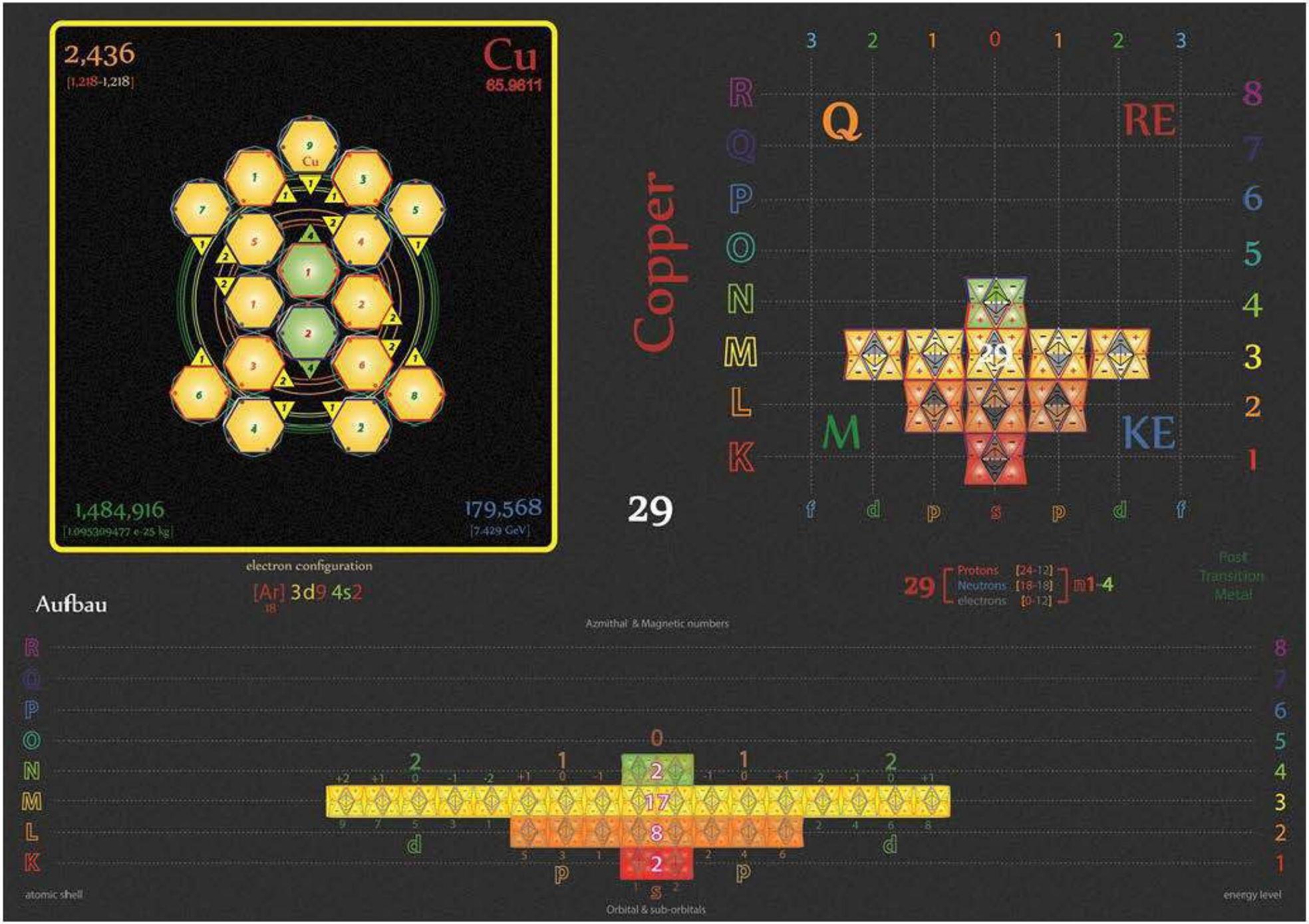

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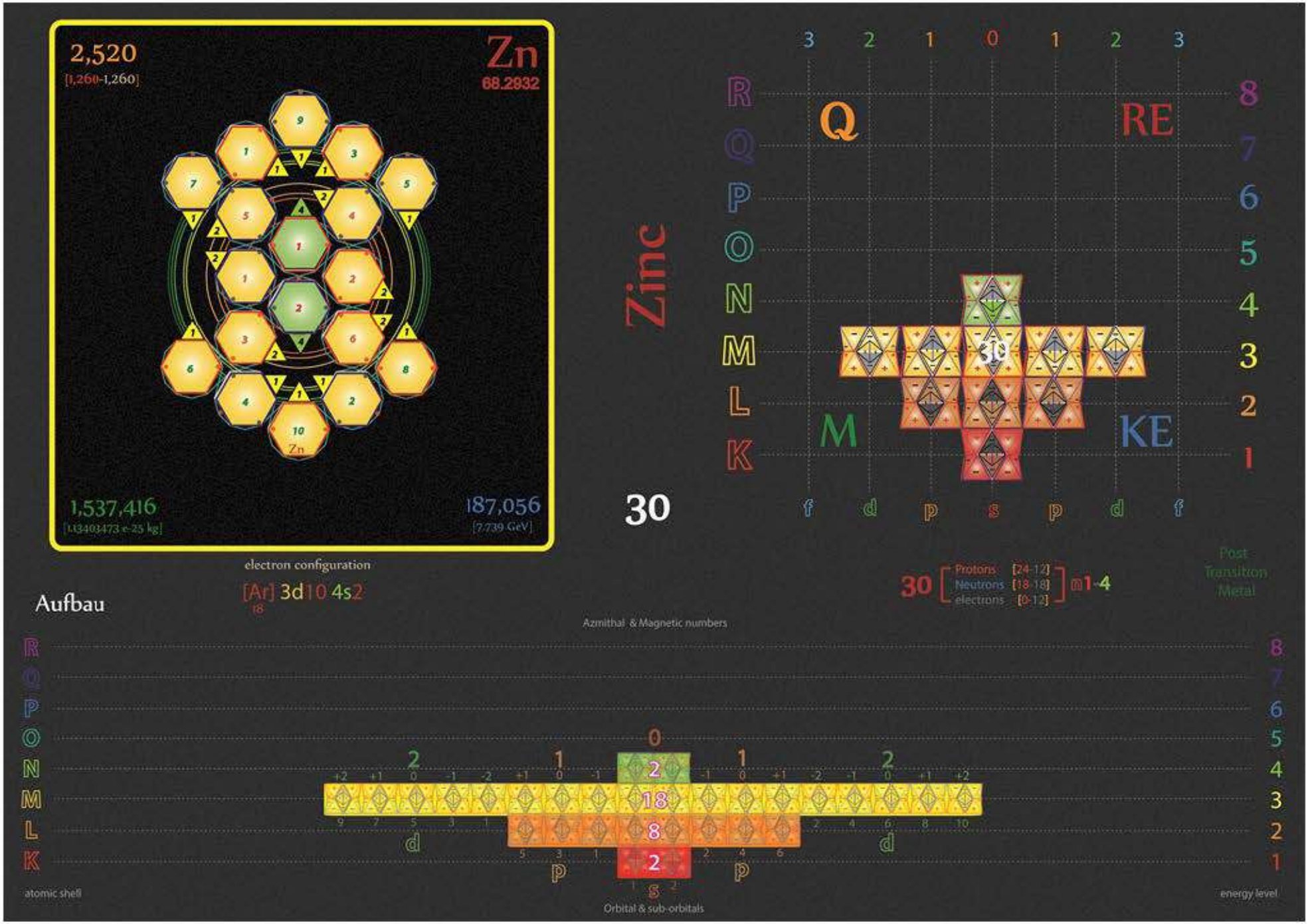

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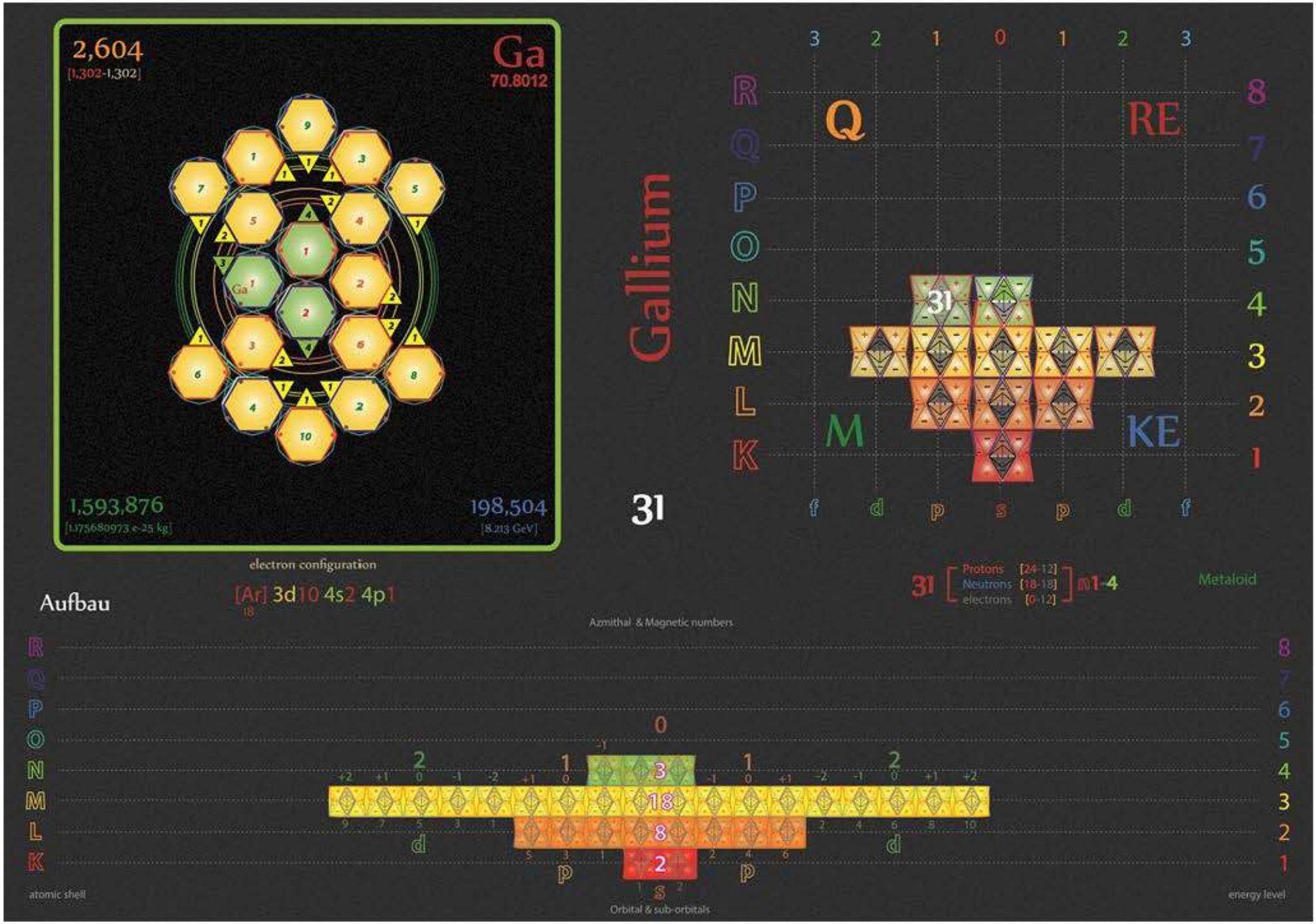

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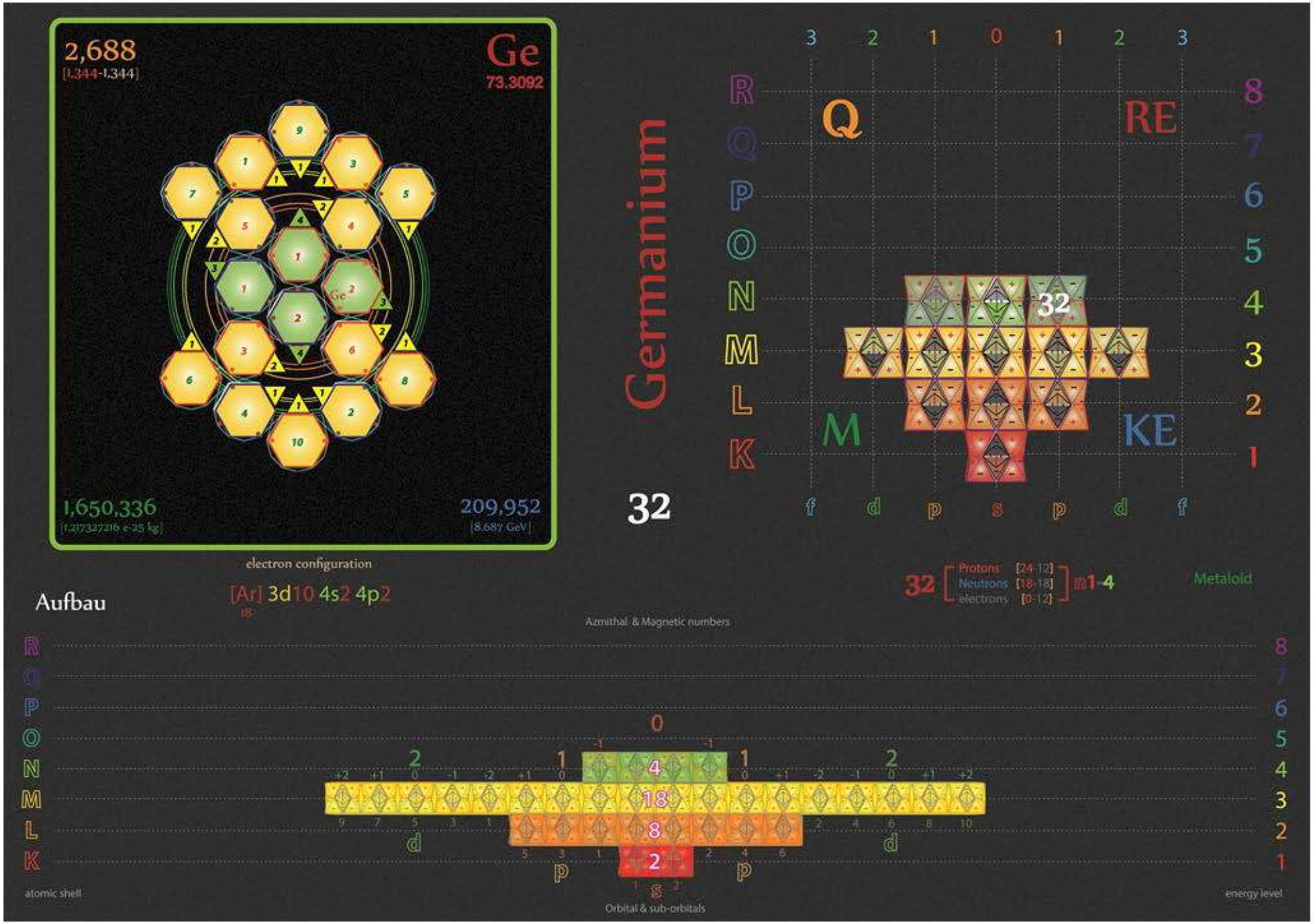

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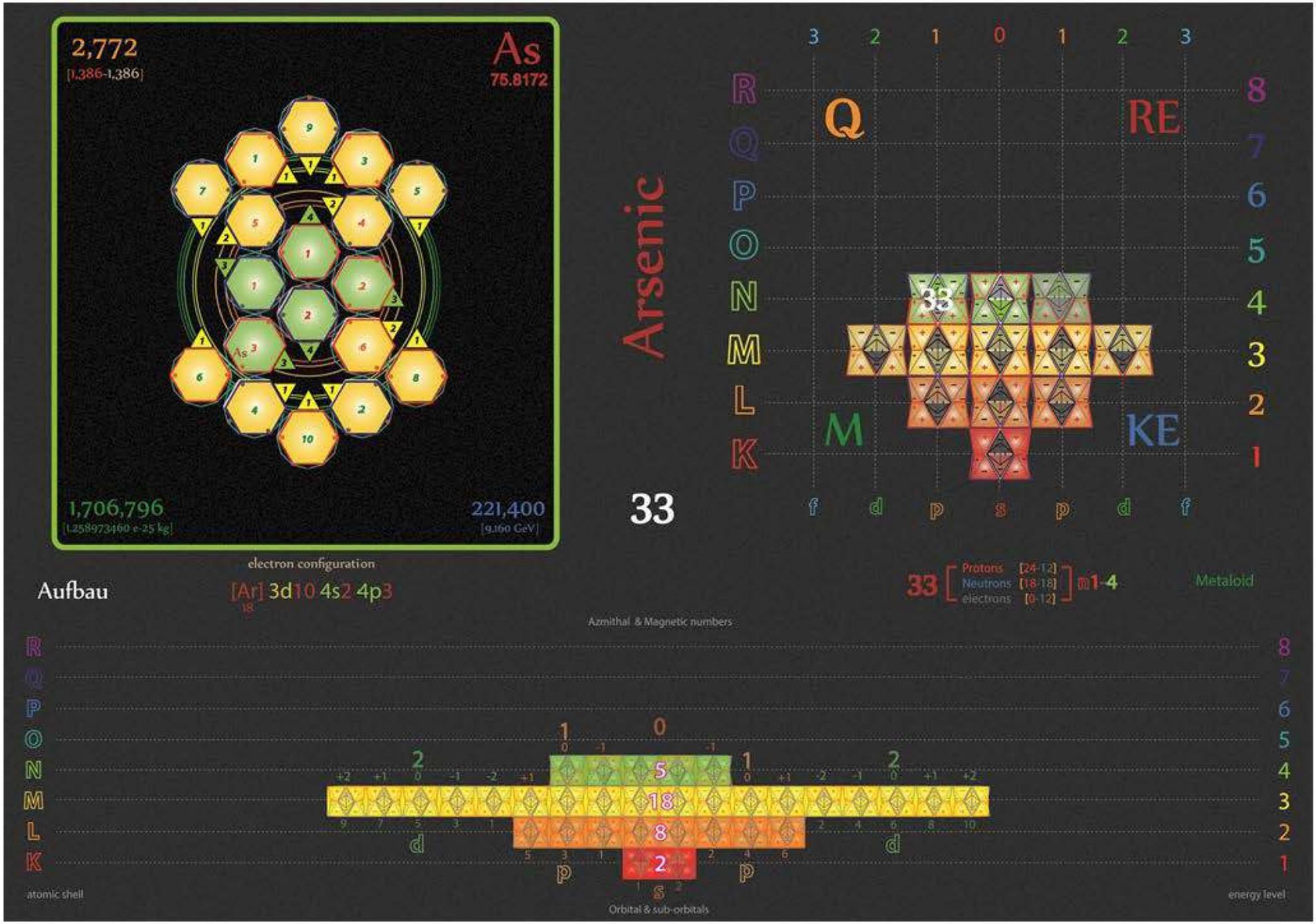

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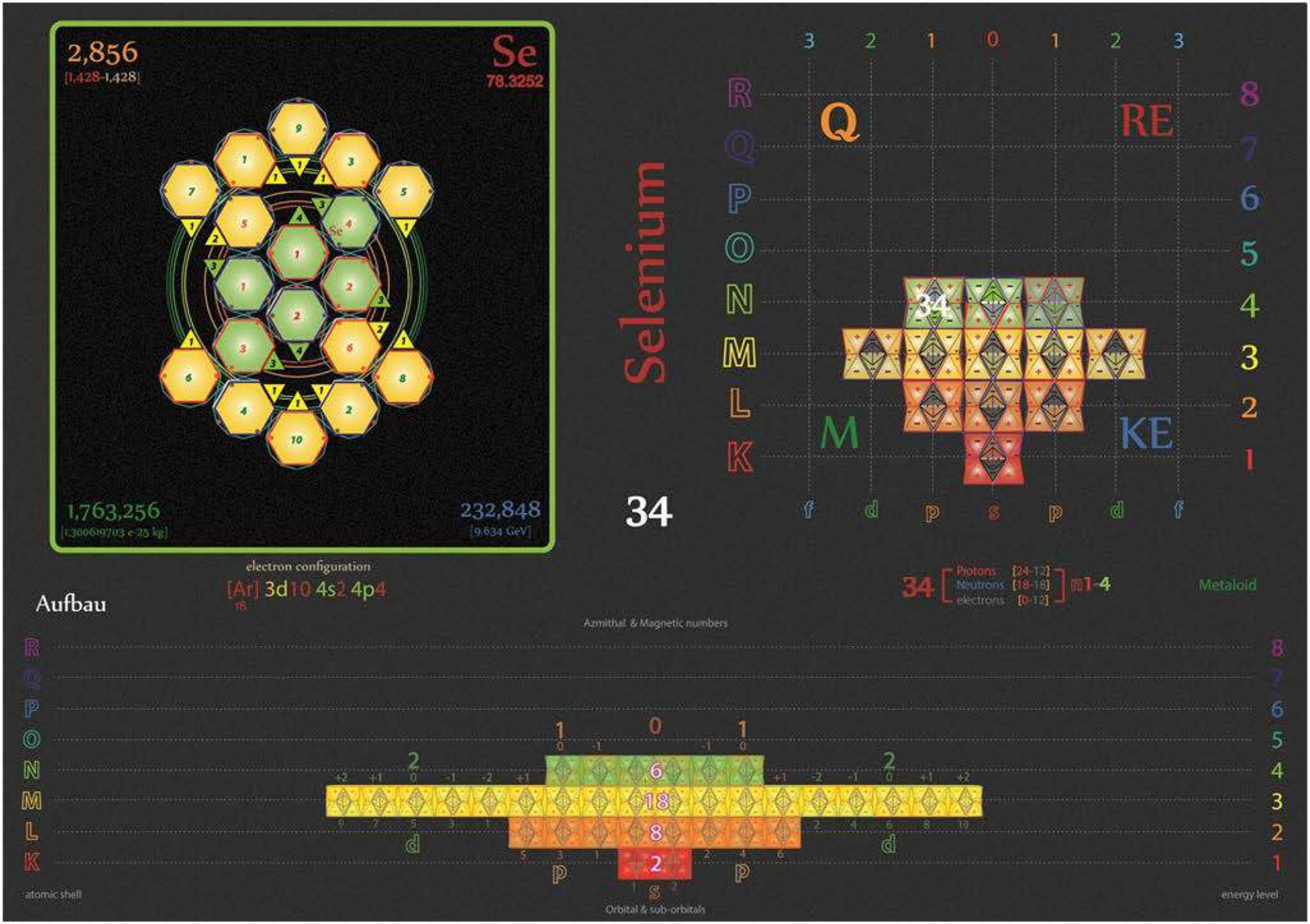

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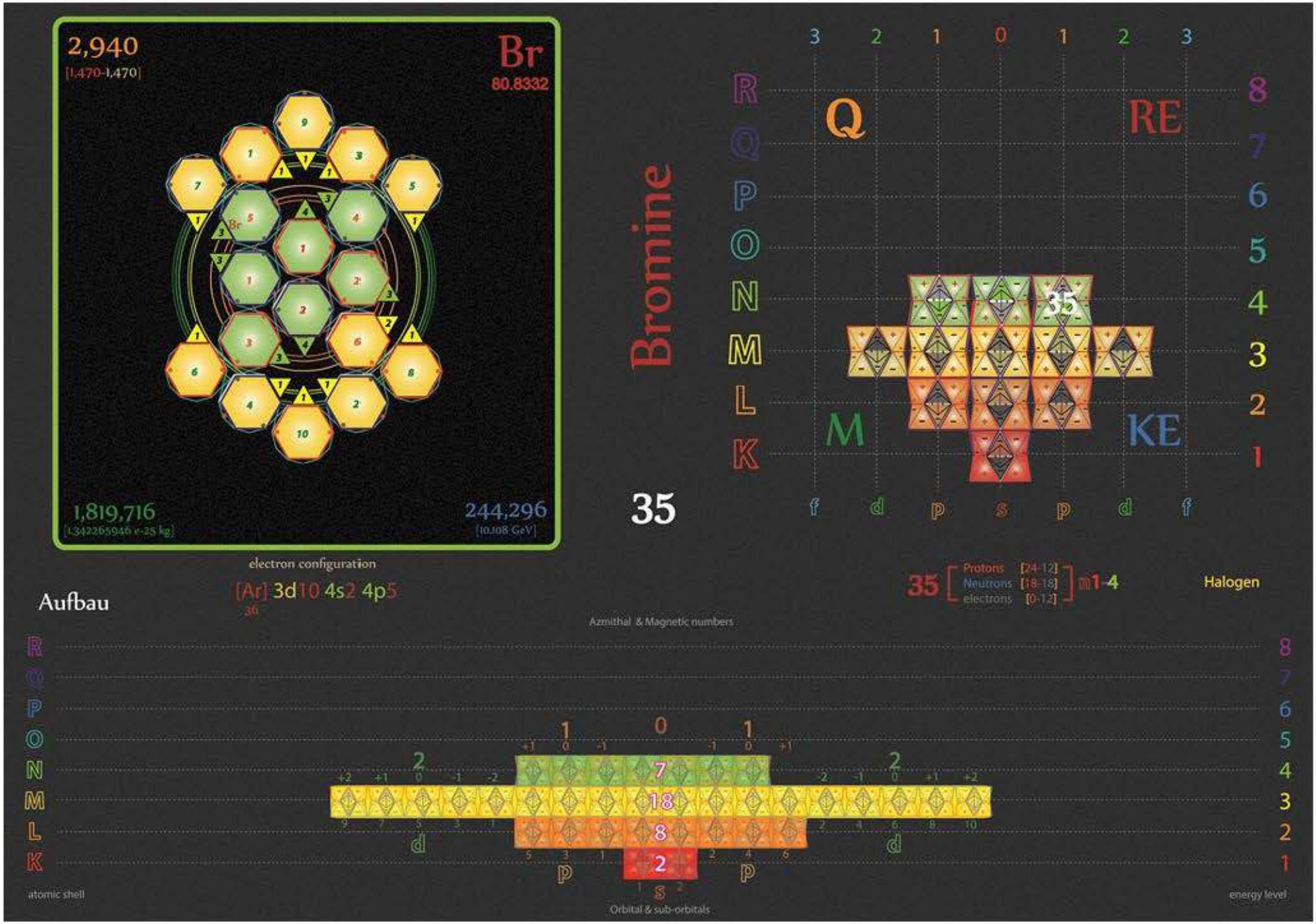

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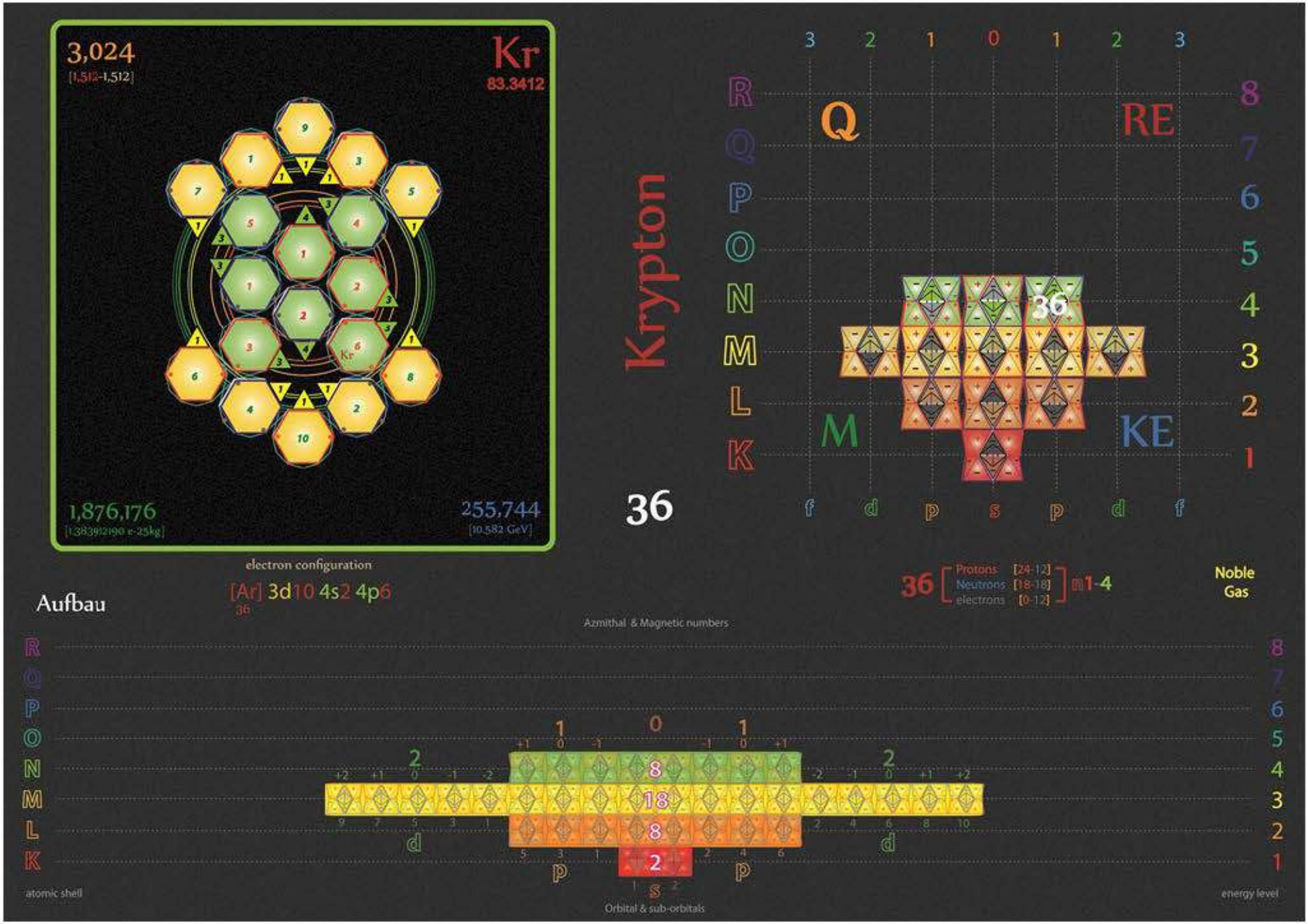

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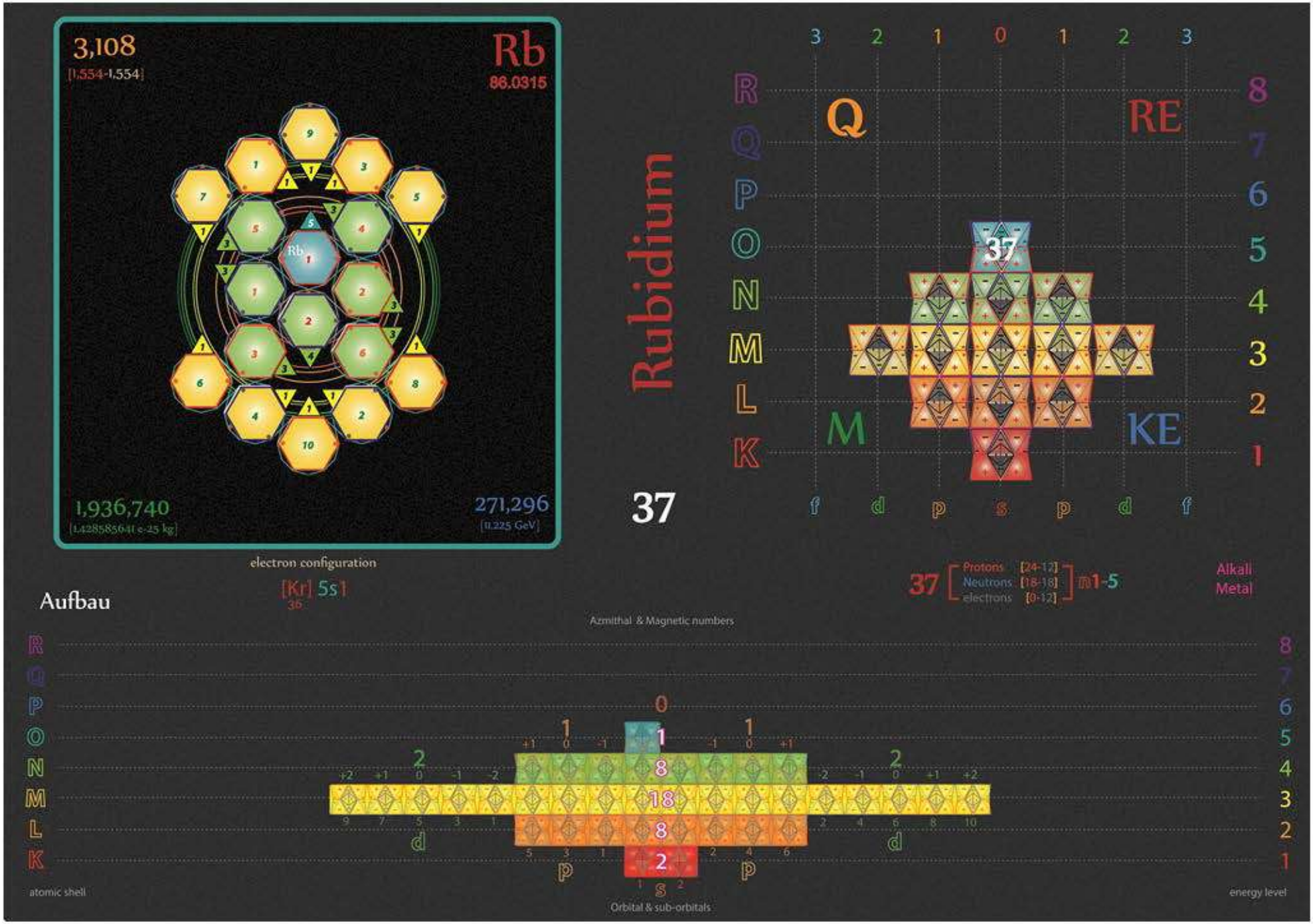

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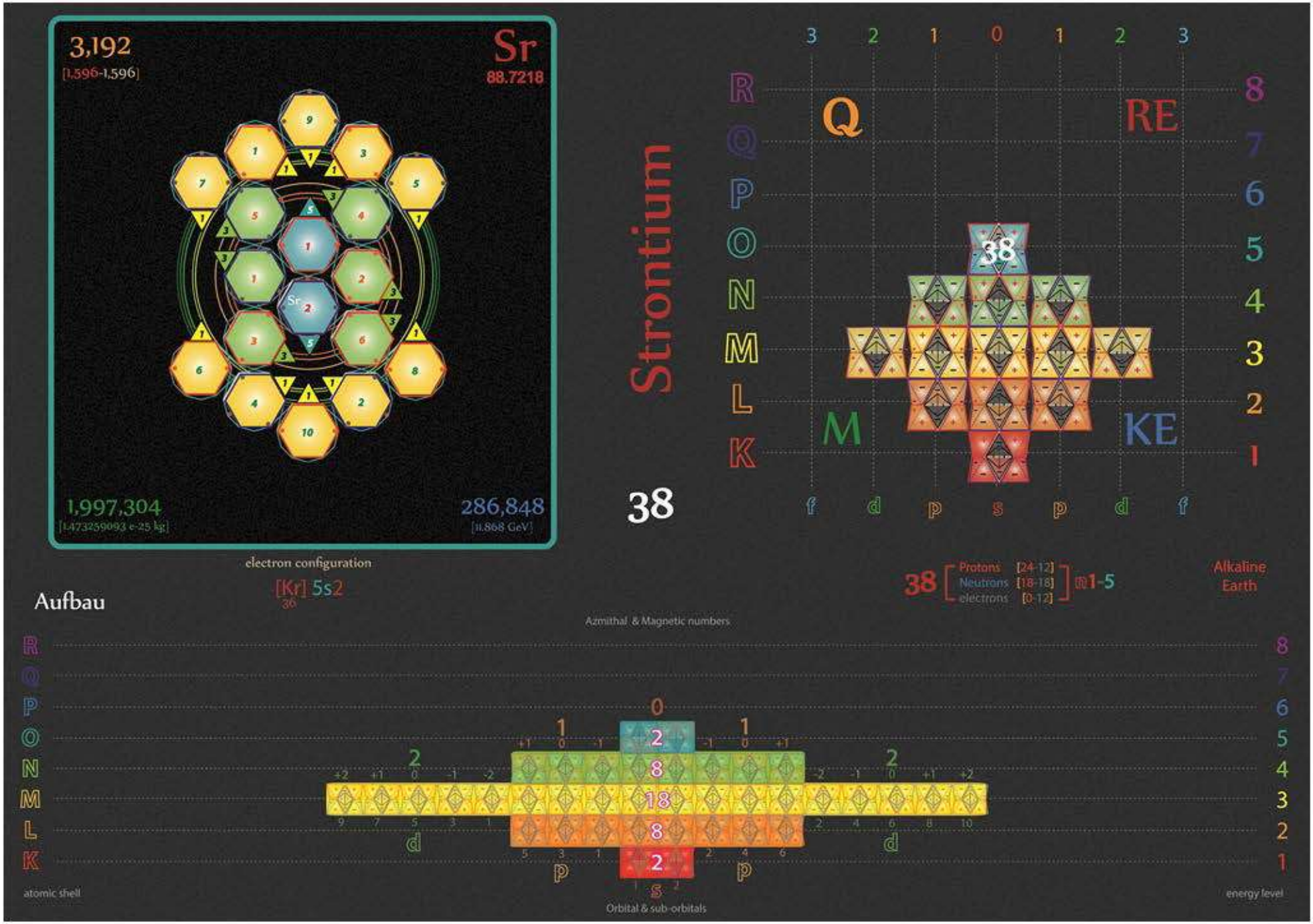

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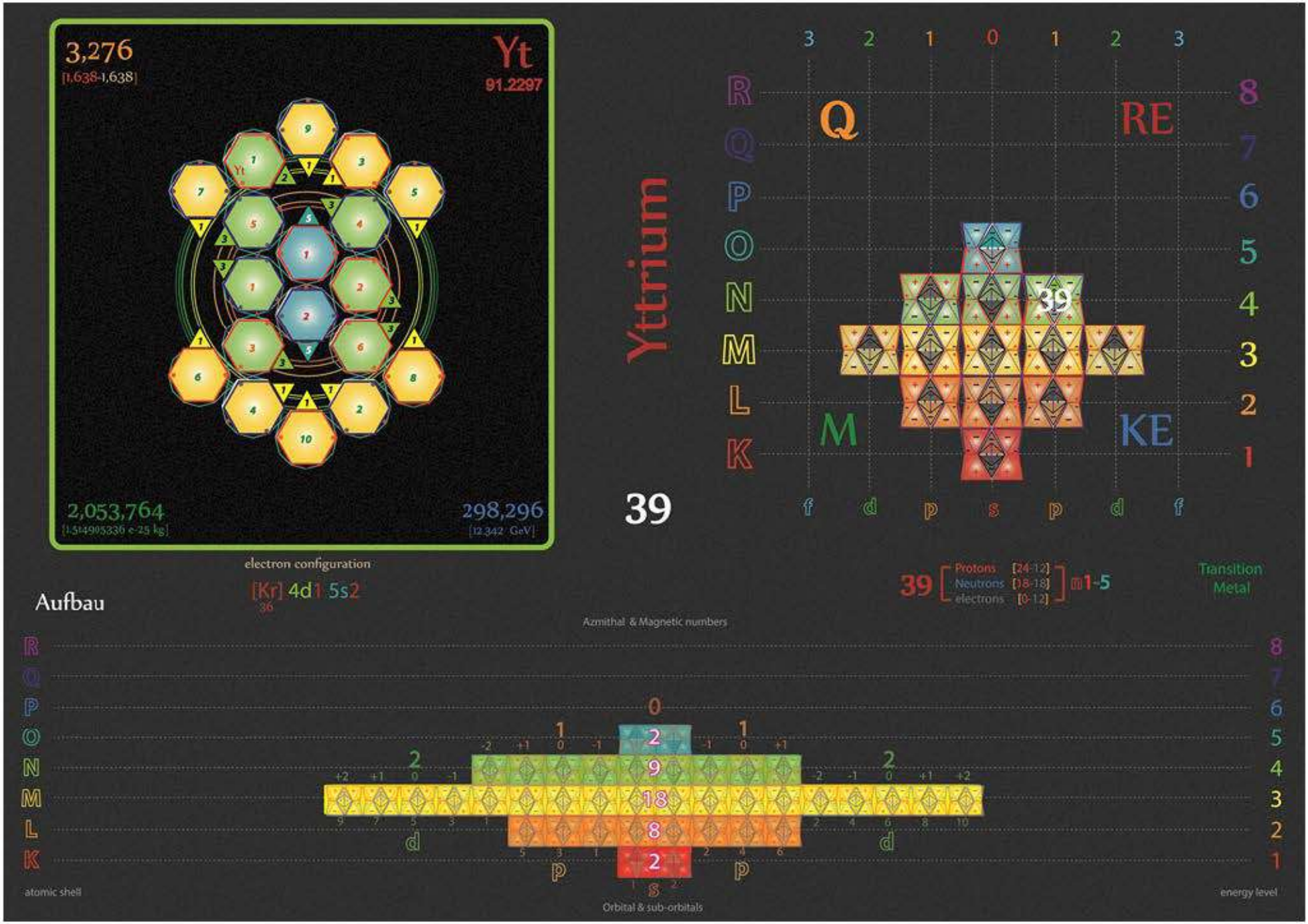

Tetryonics 51.39 - Yttrium atom

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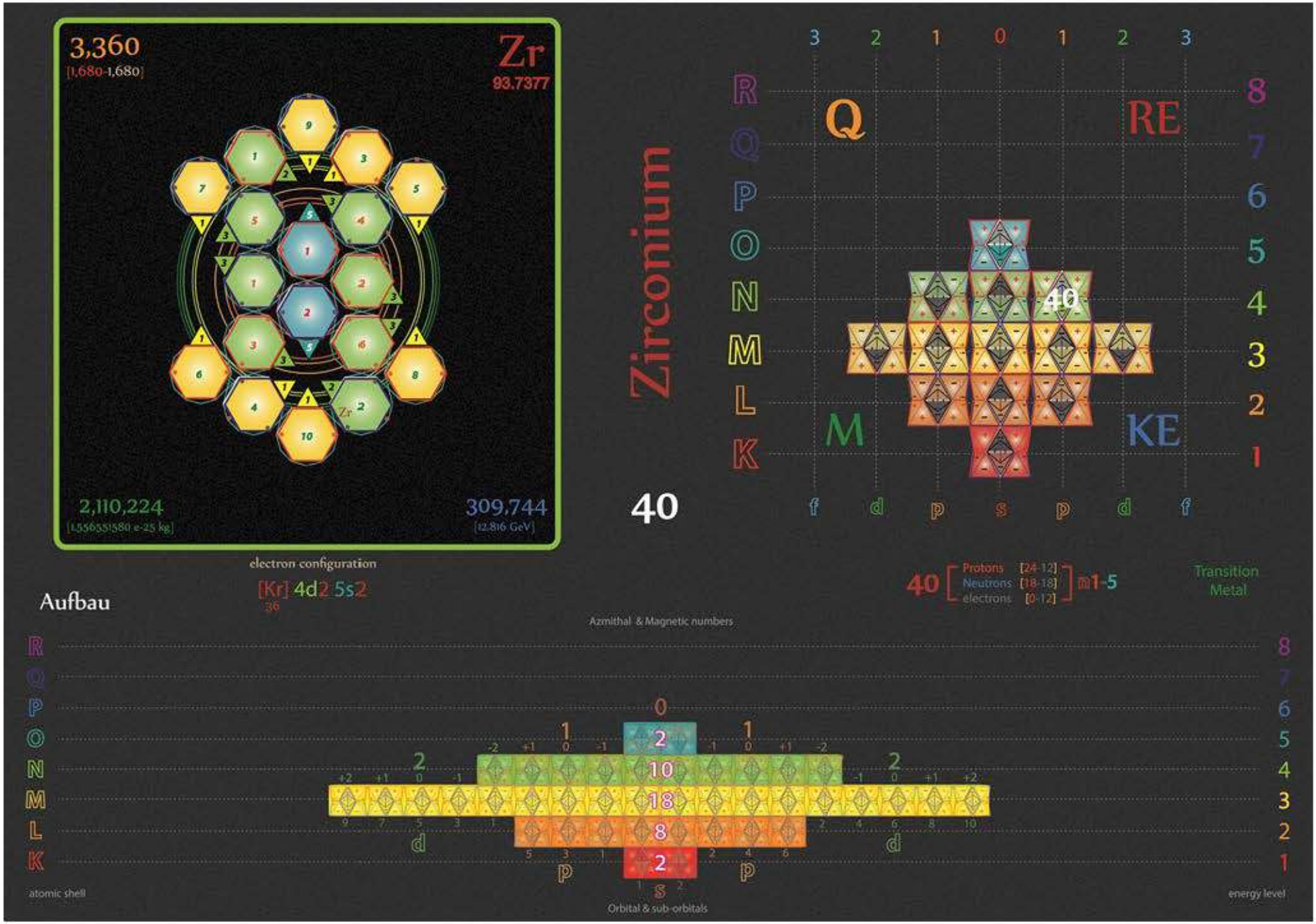

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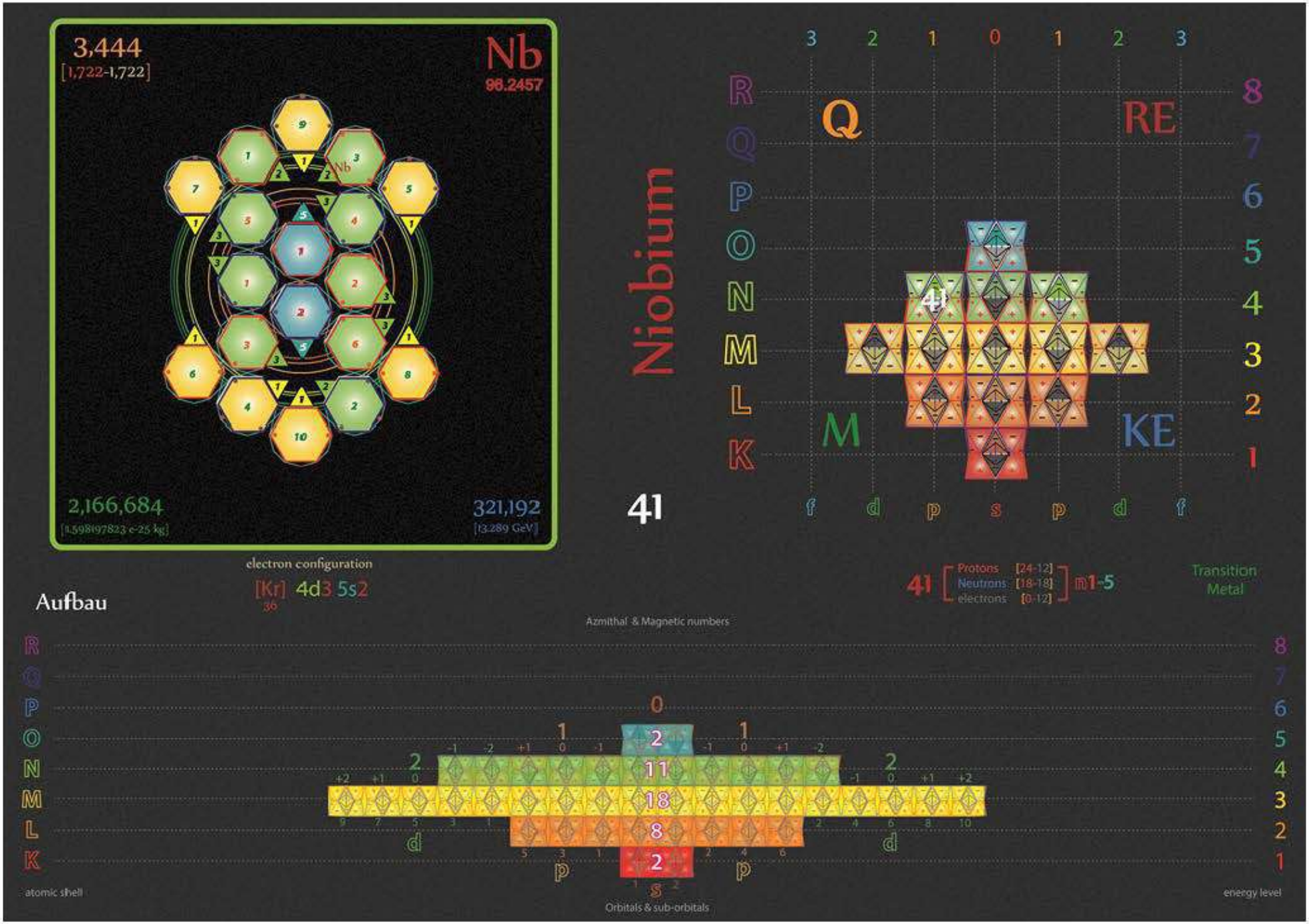

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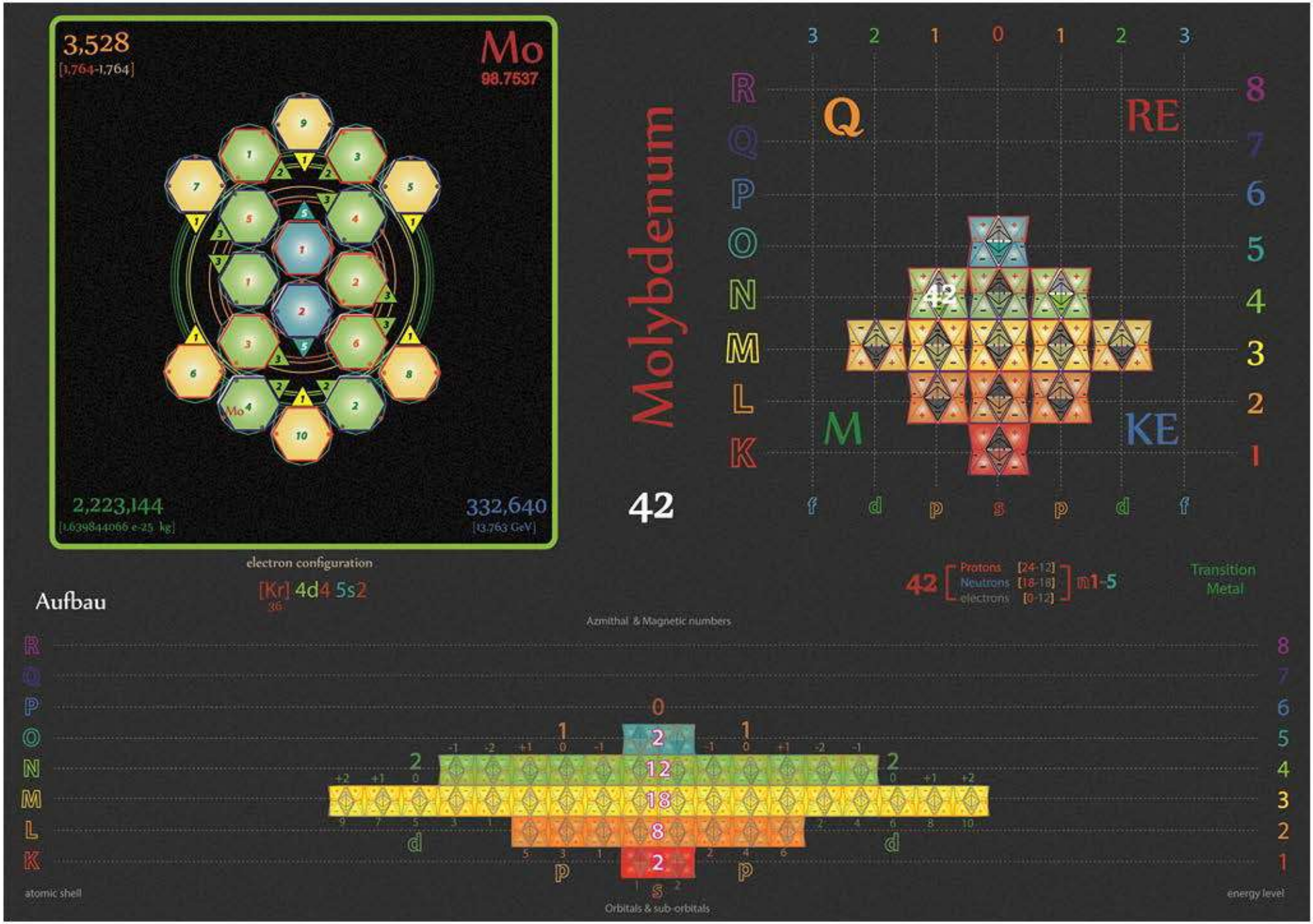

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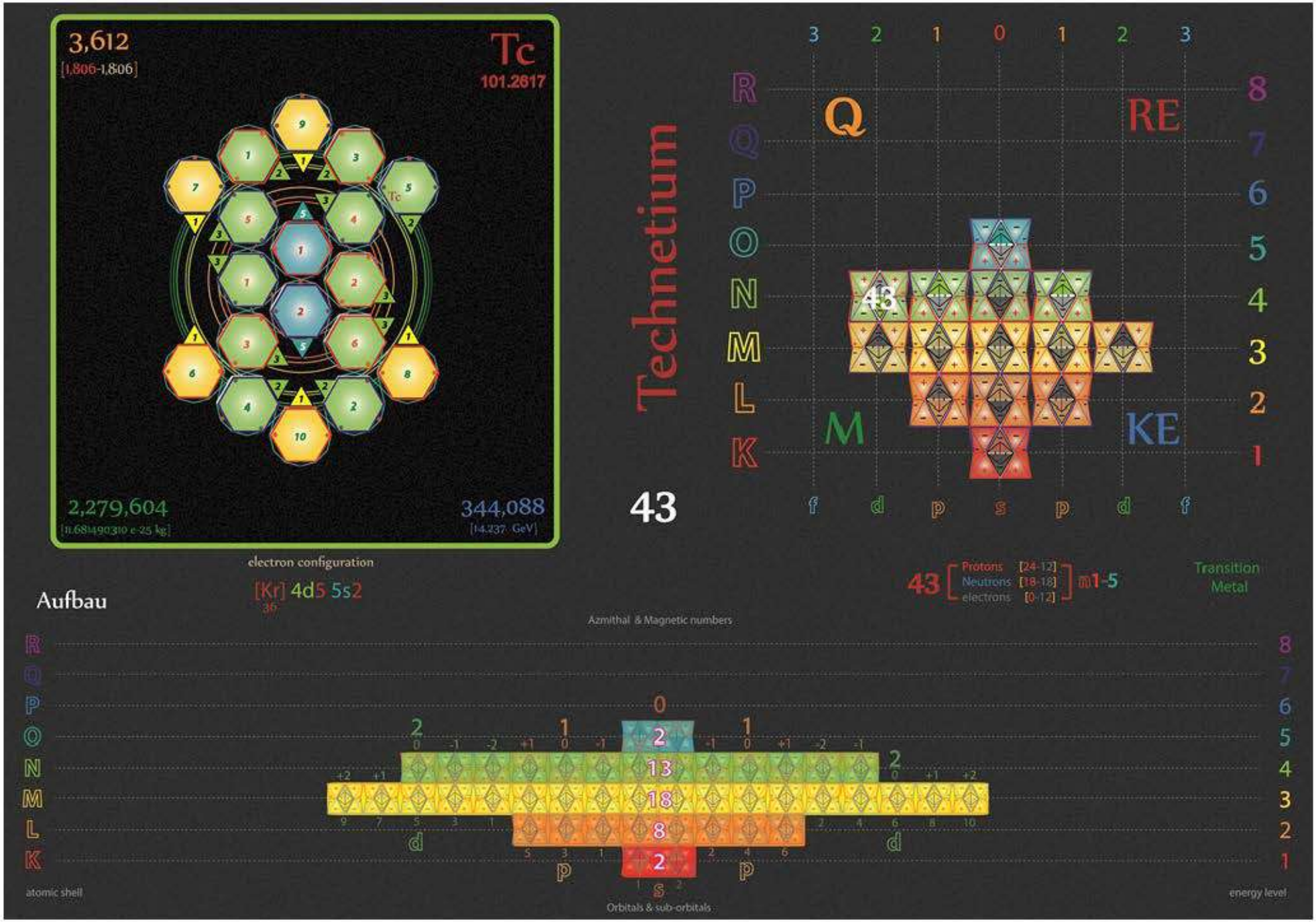

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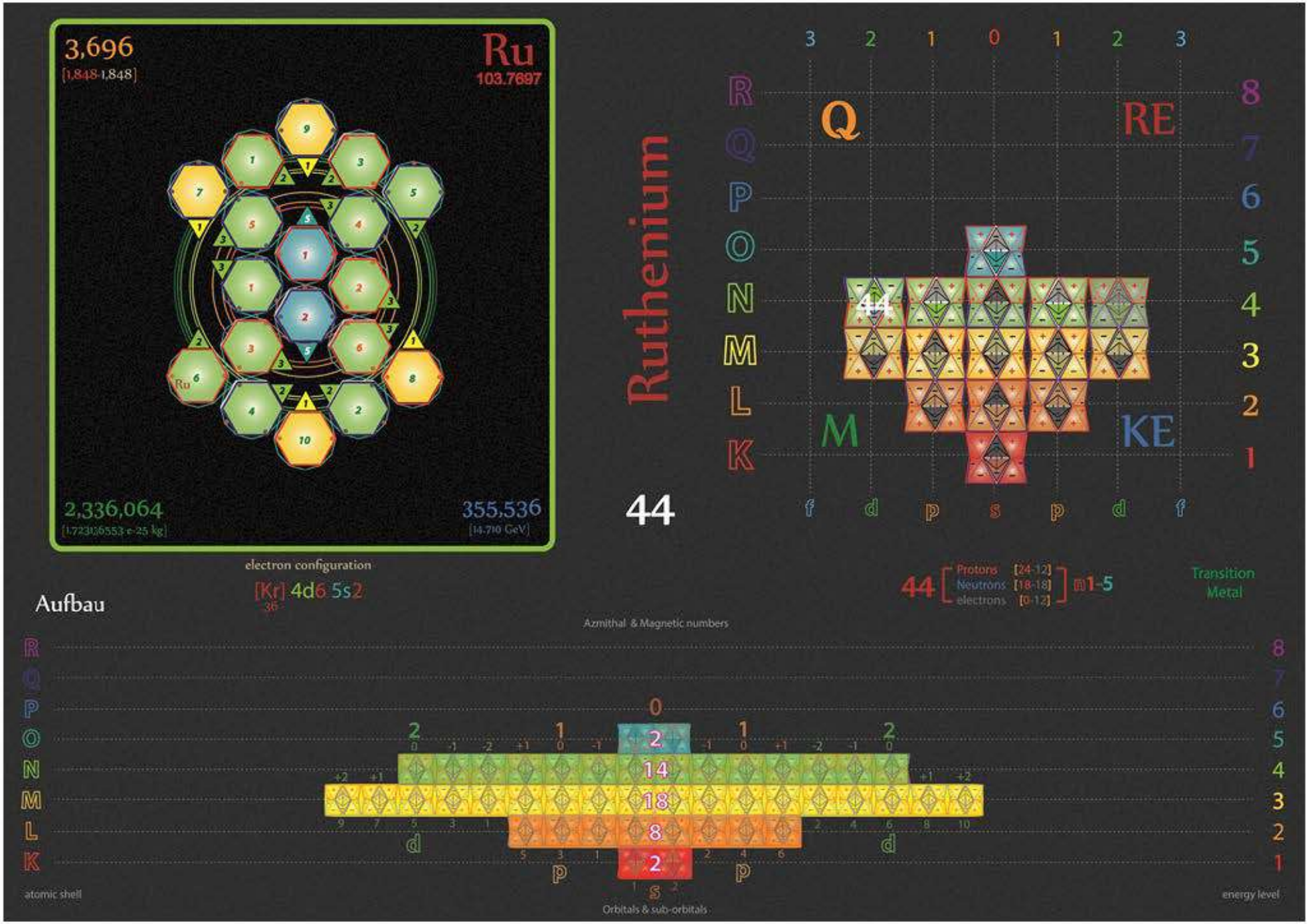

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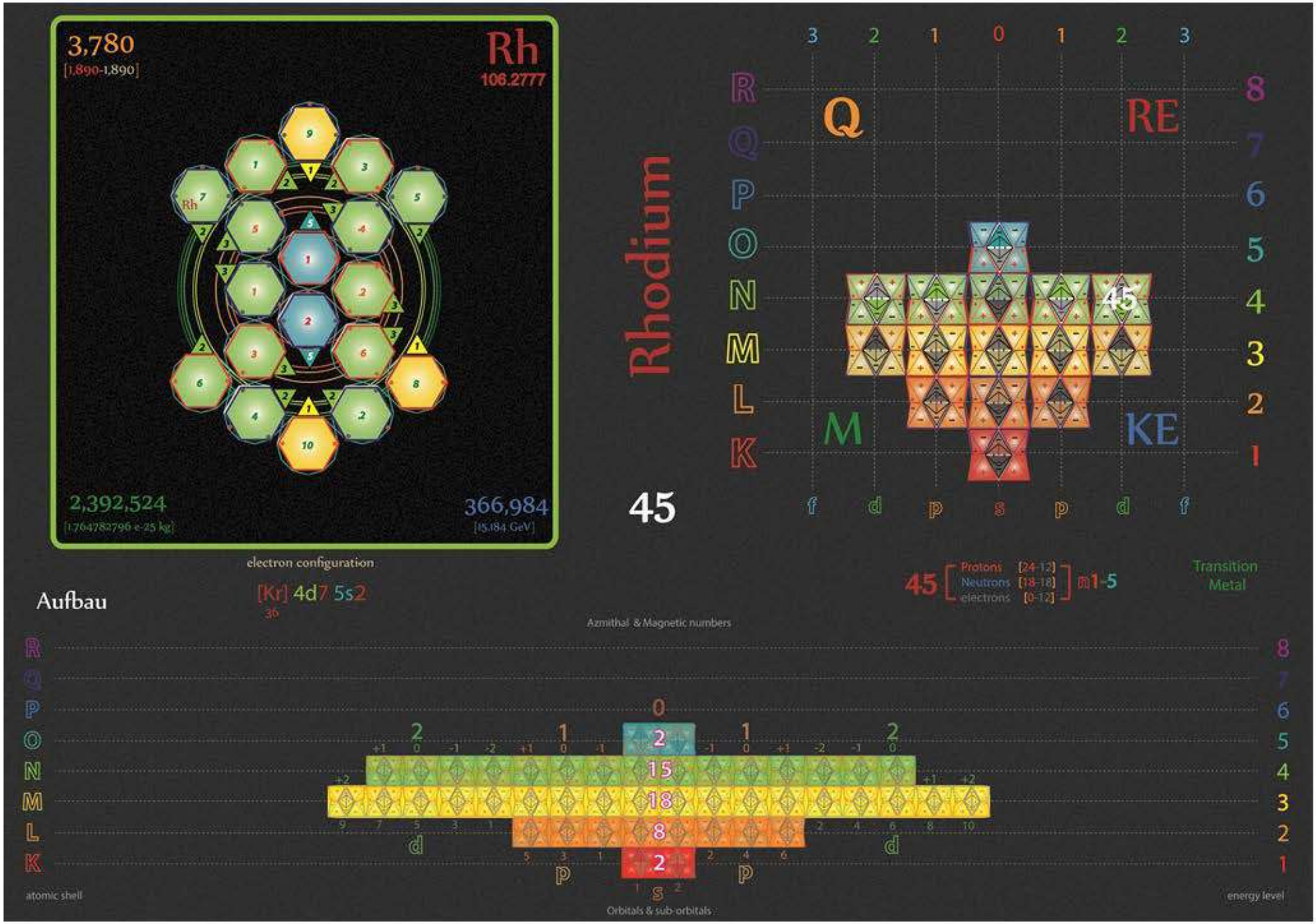

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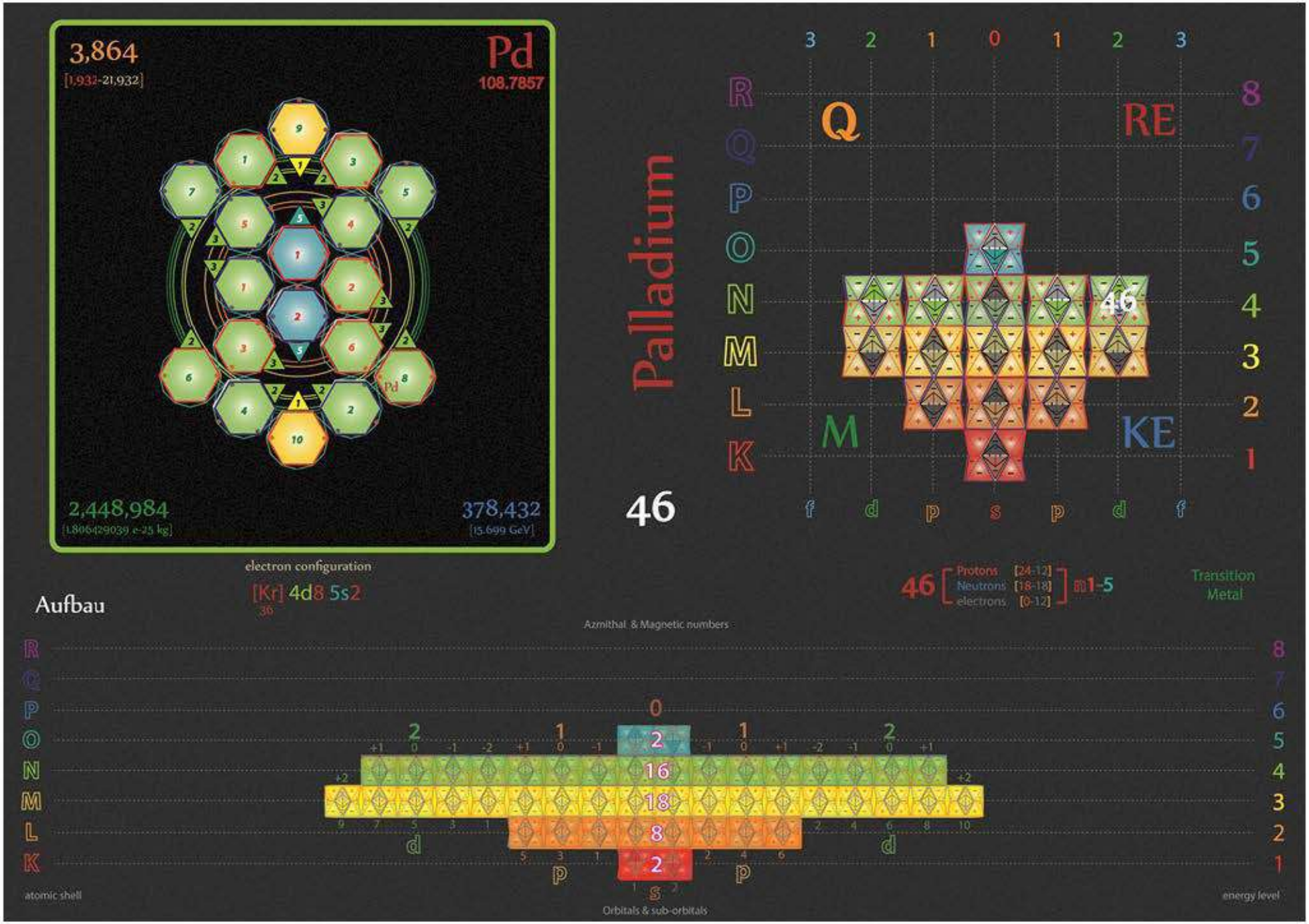

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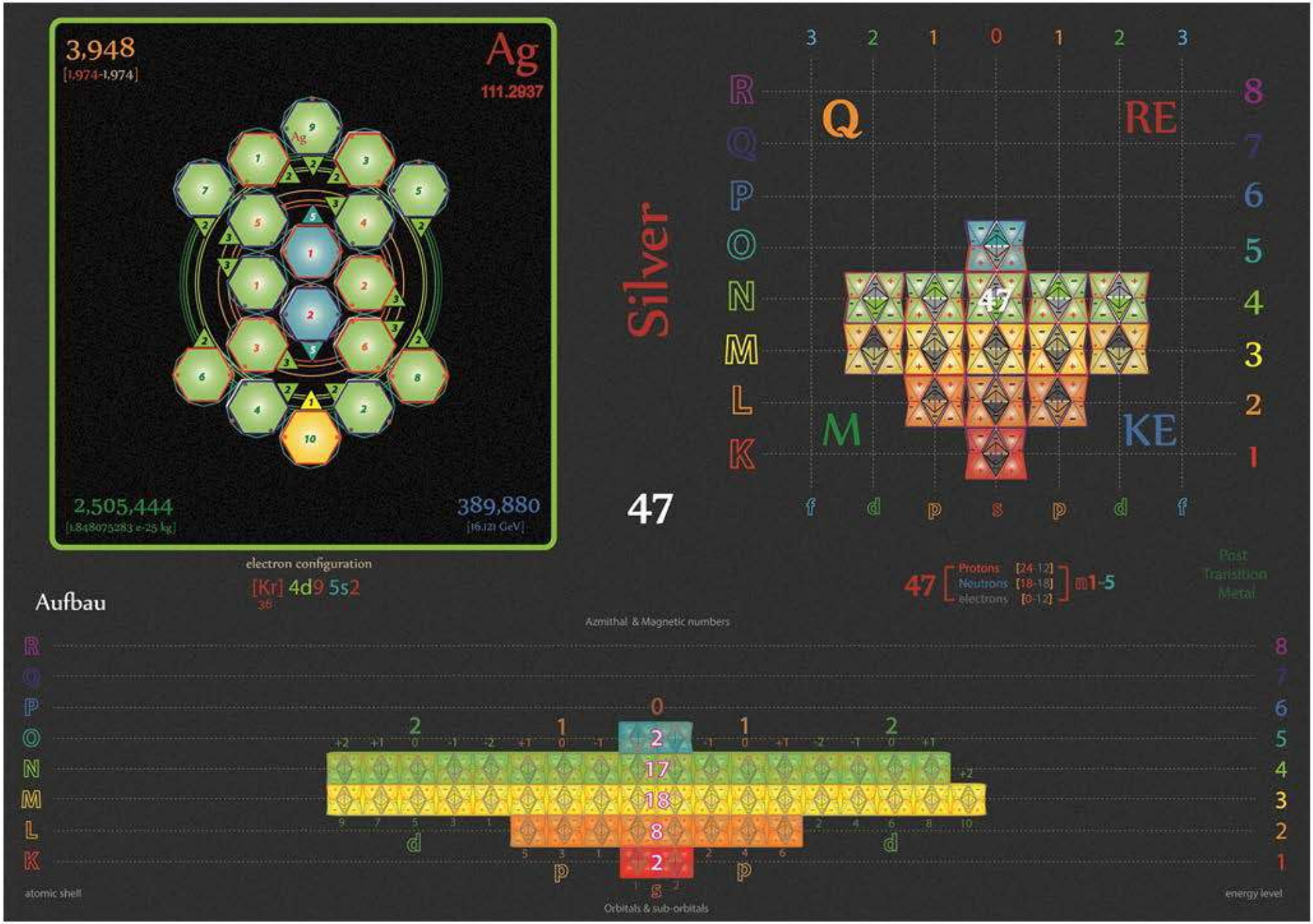

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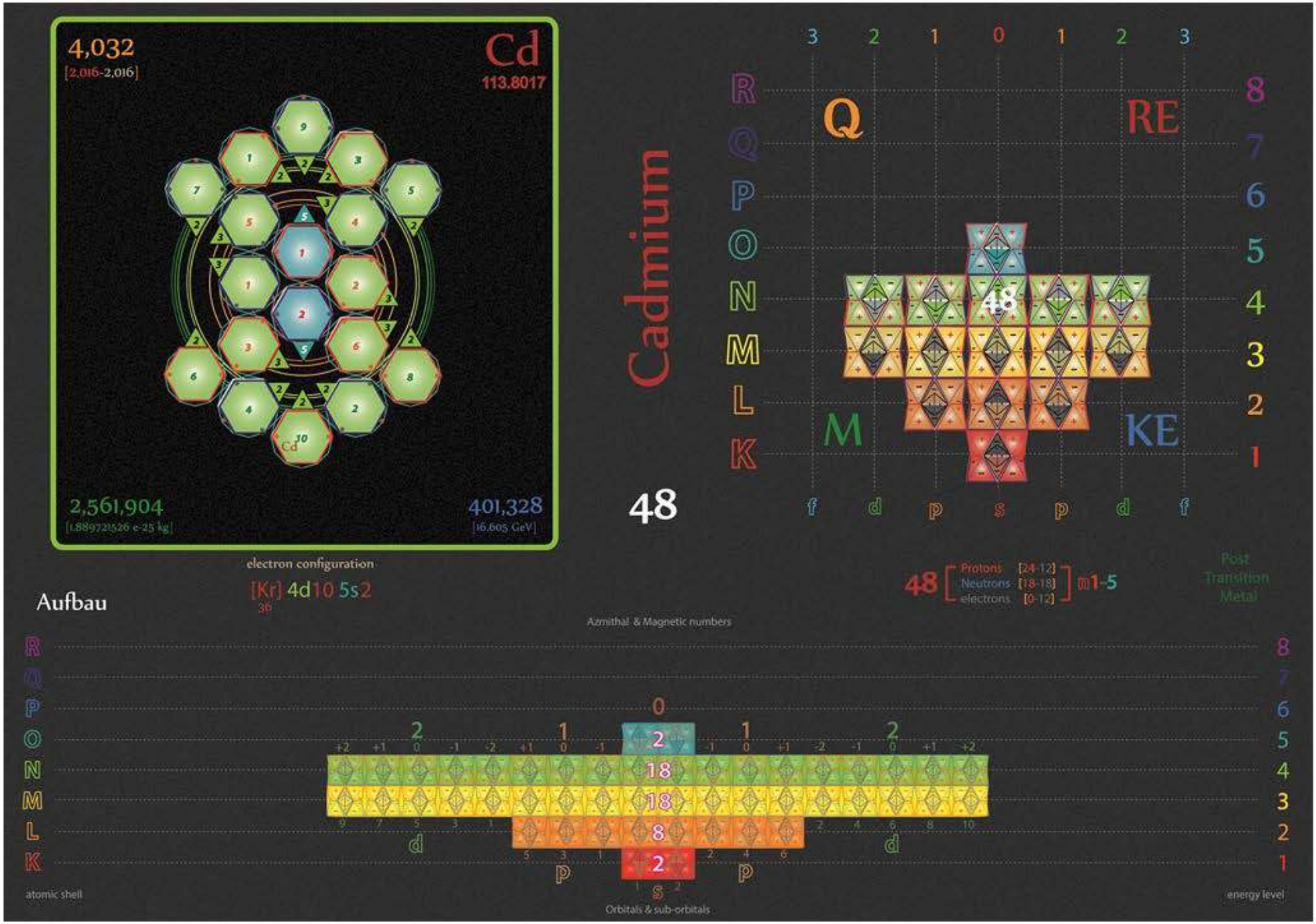

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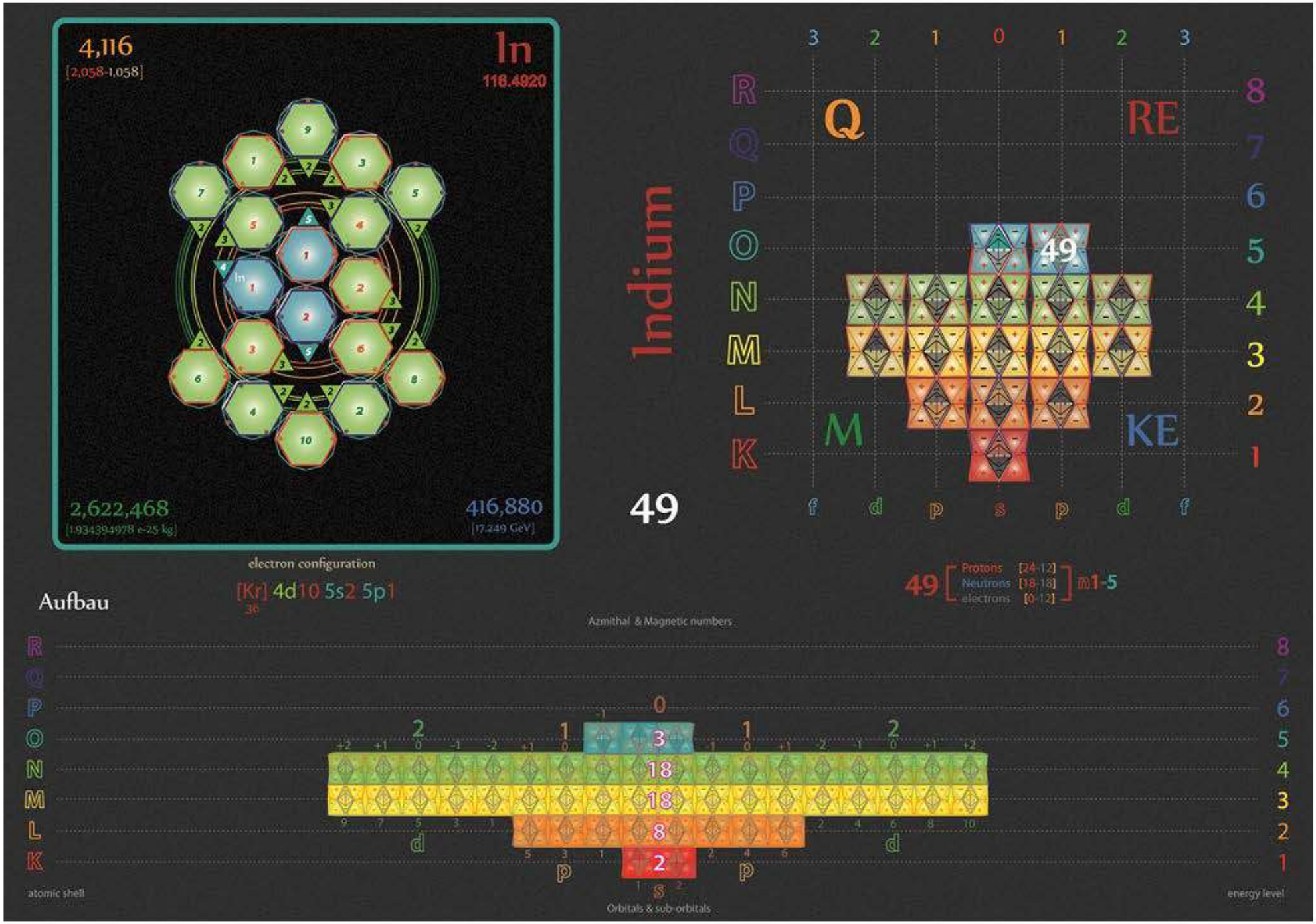

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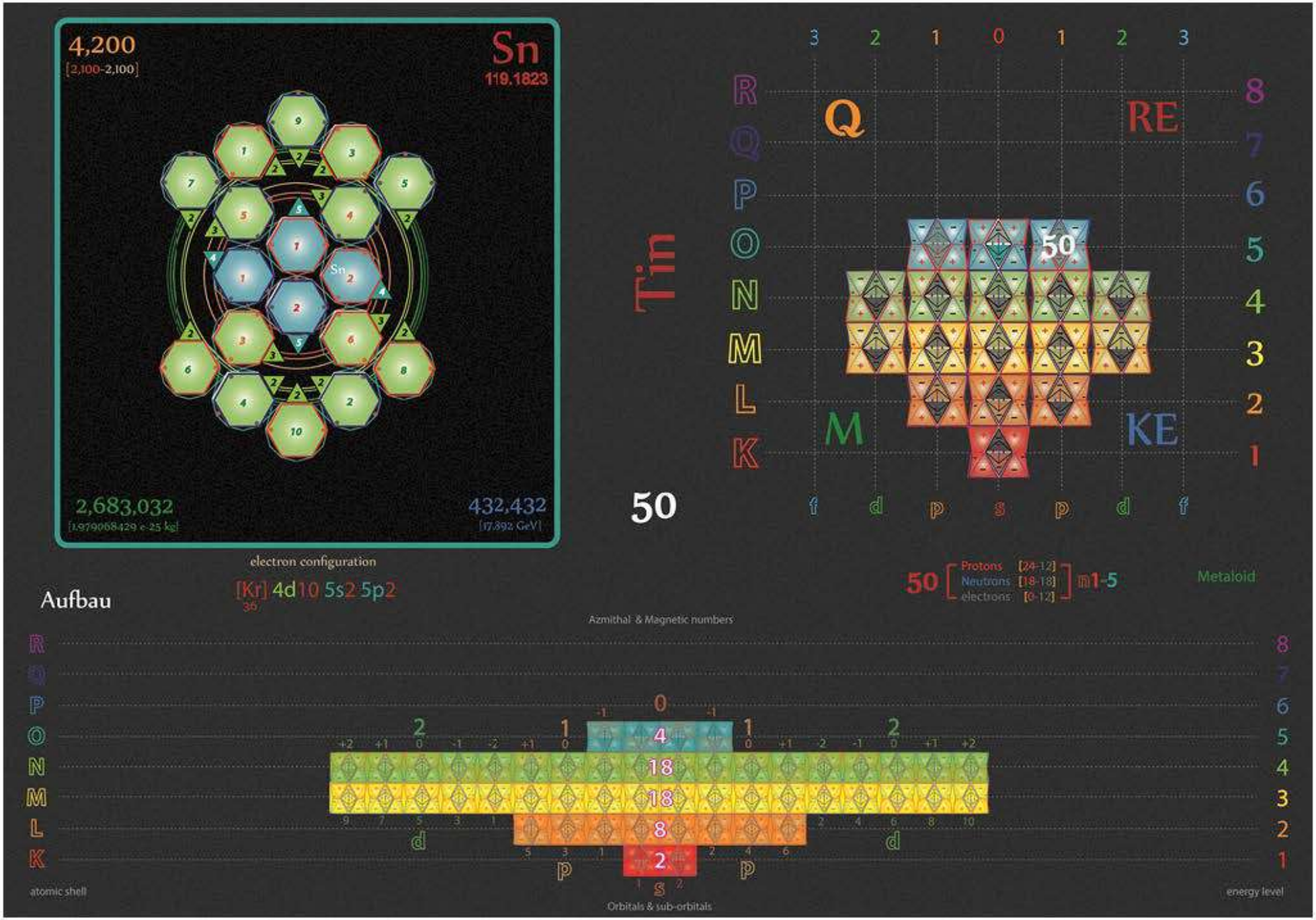

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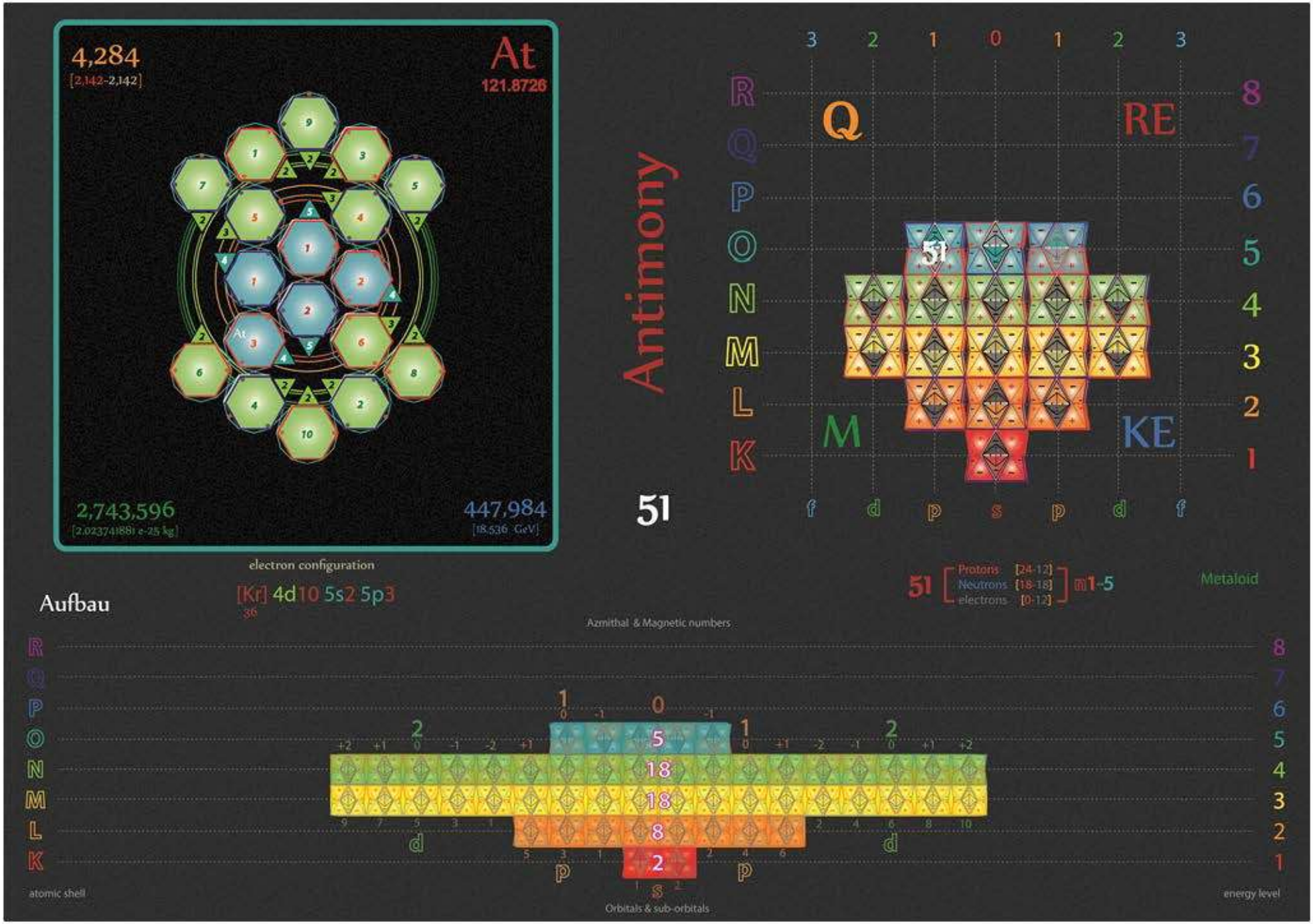

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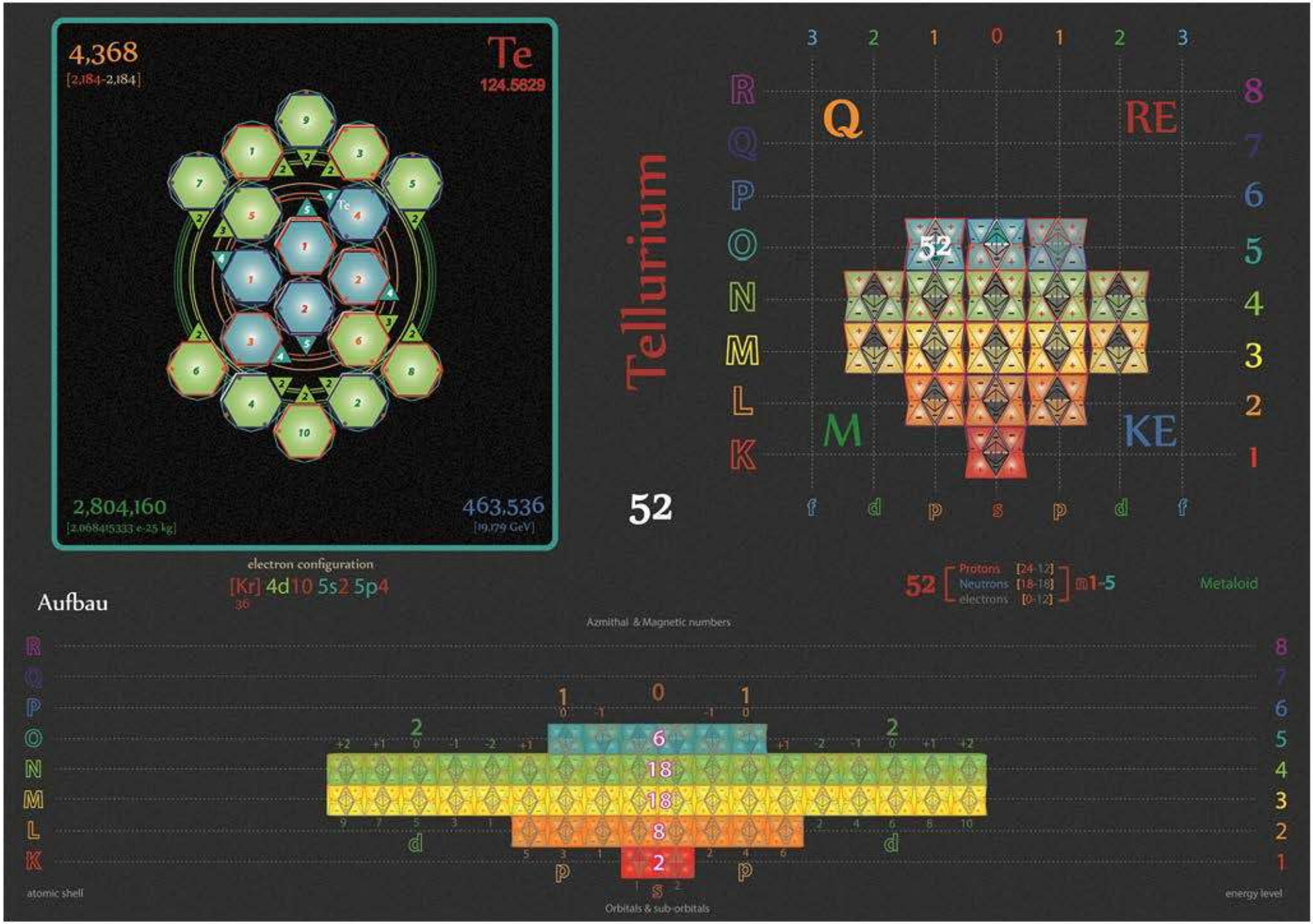

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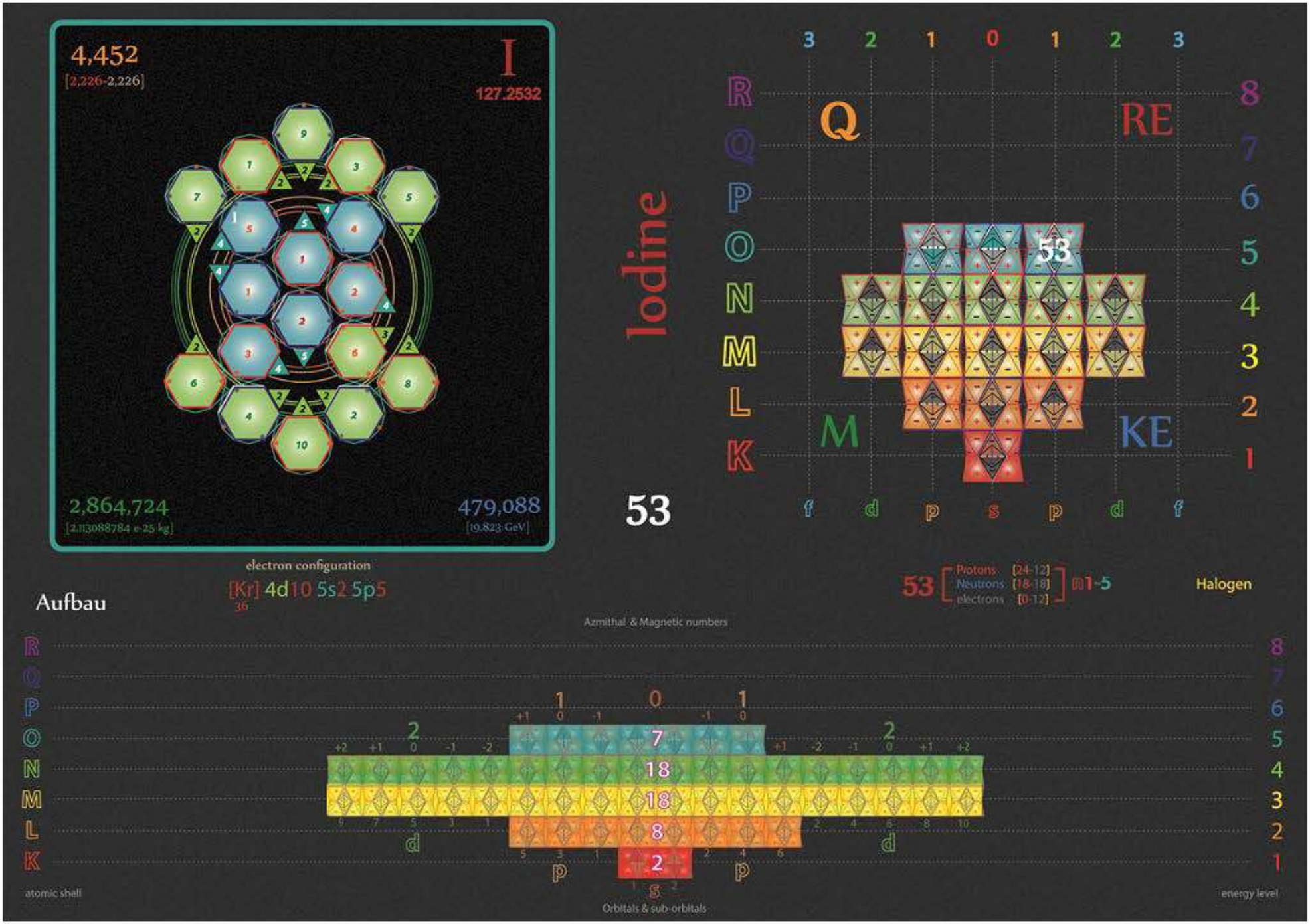

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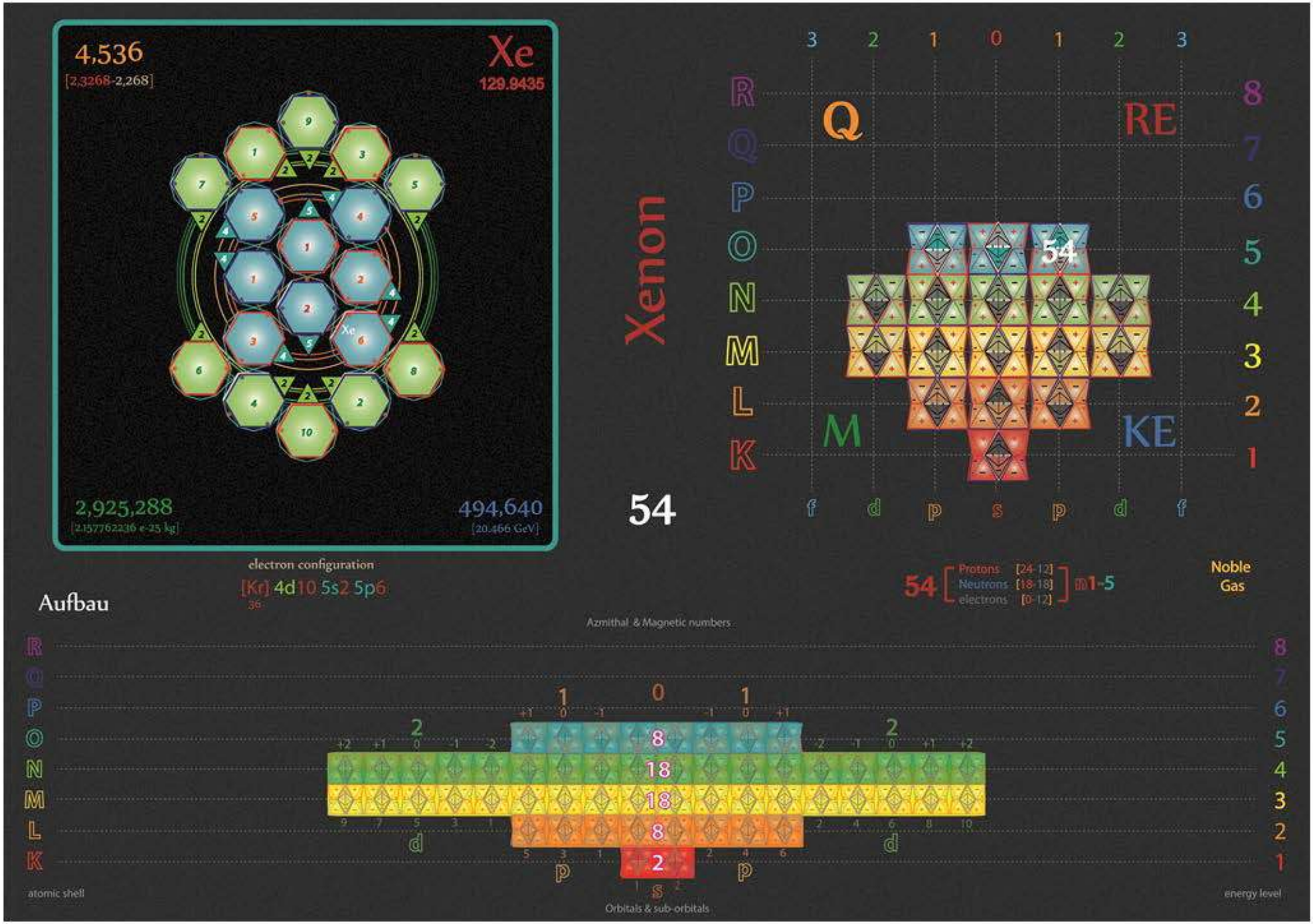

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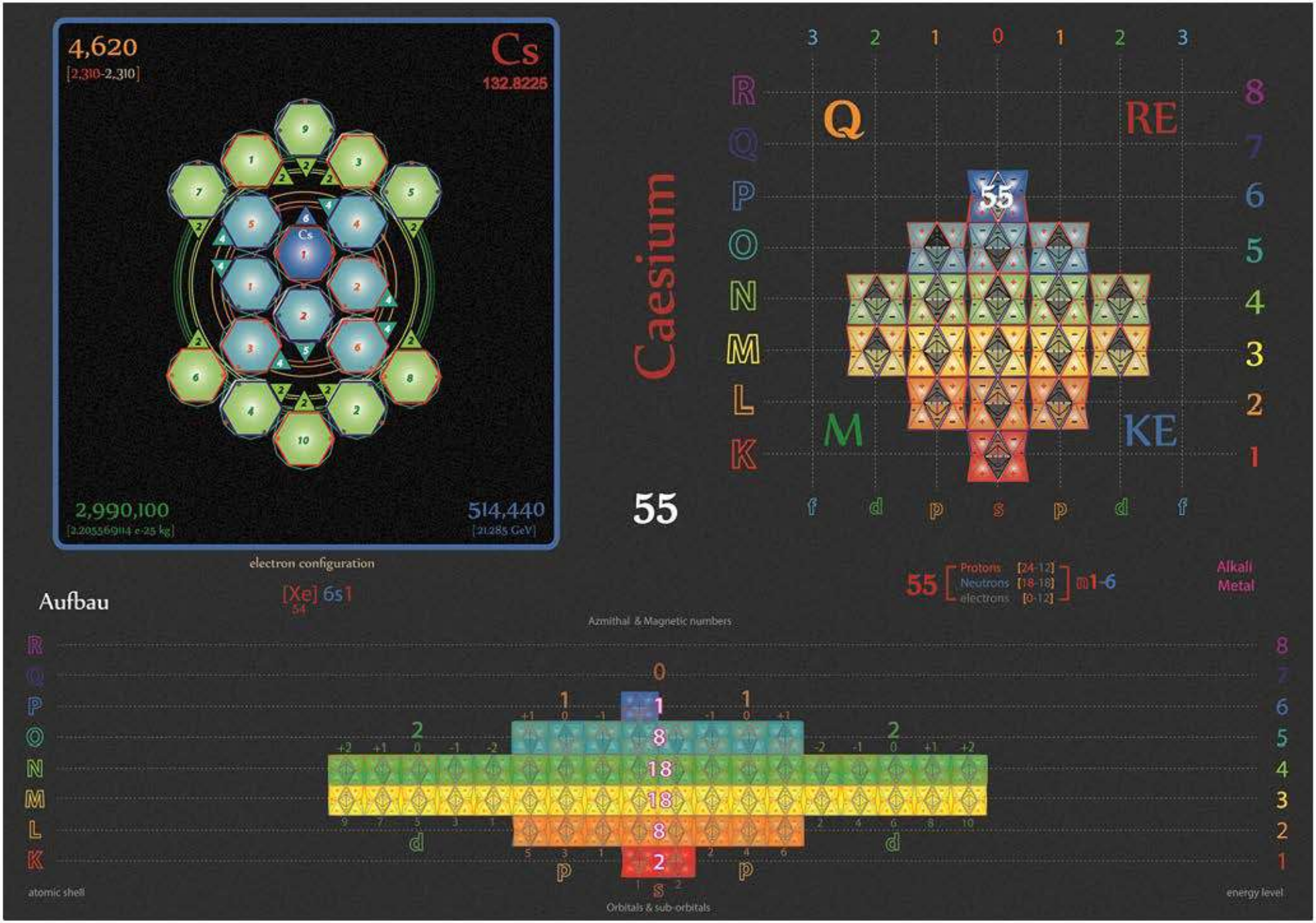

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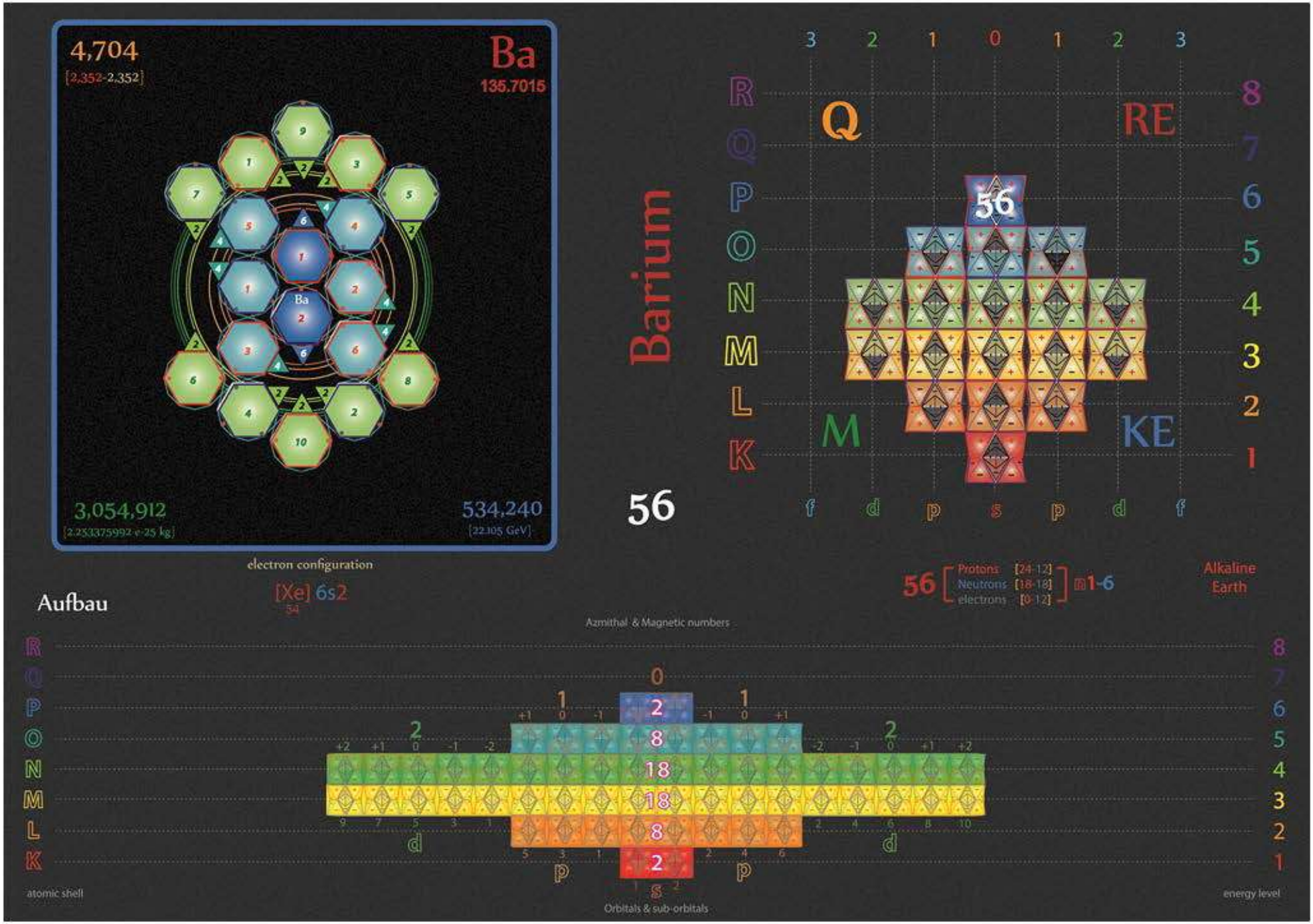

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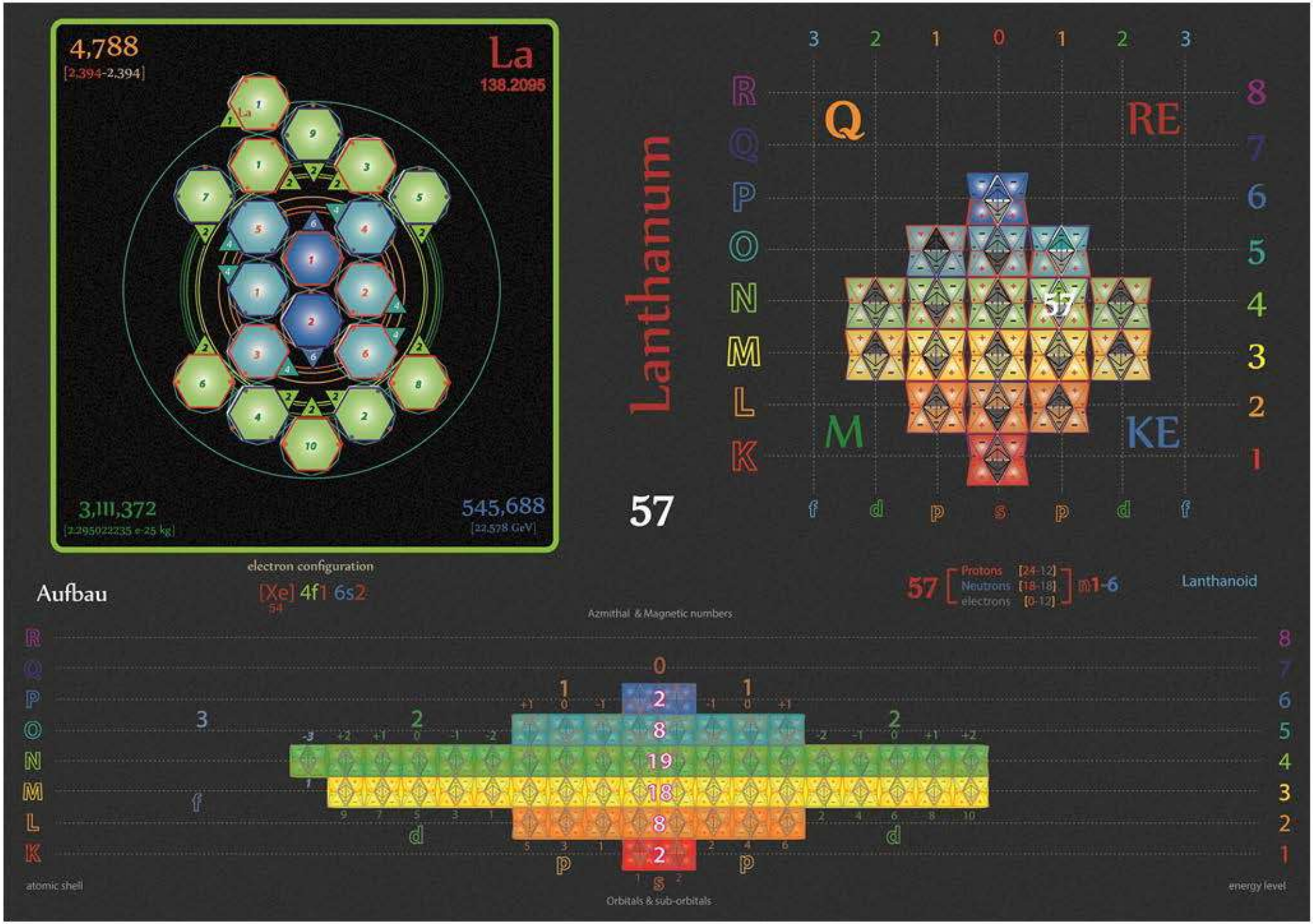

Tetryonics 51.57 - Lanthanum atom

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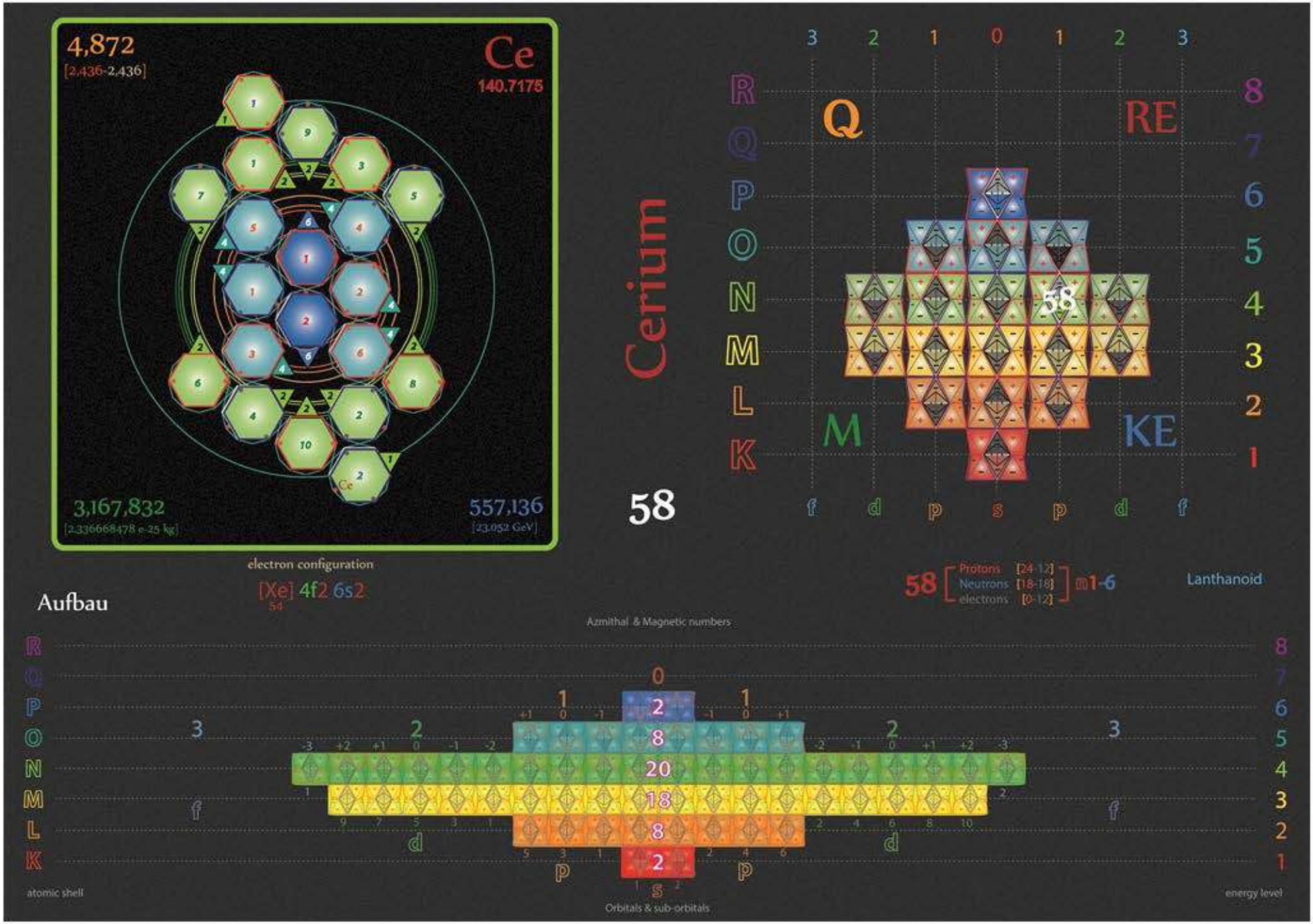

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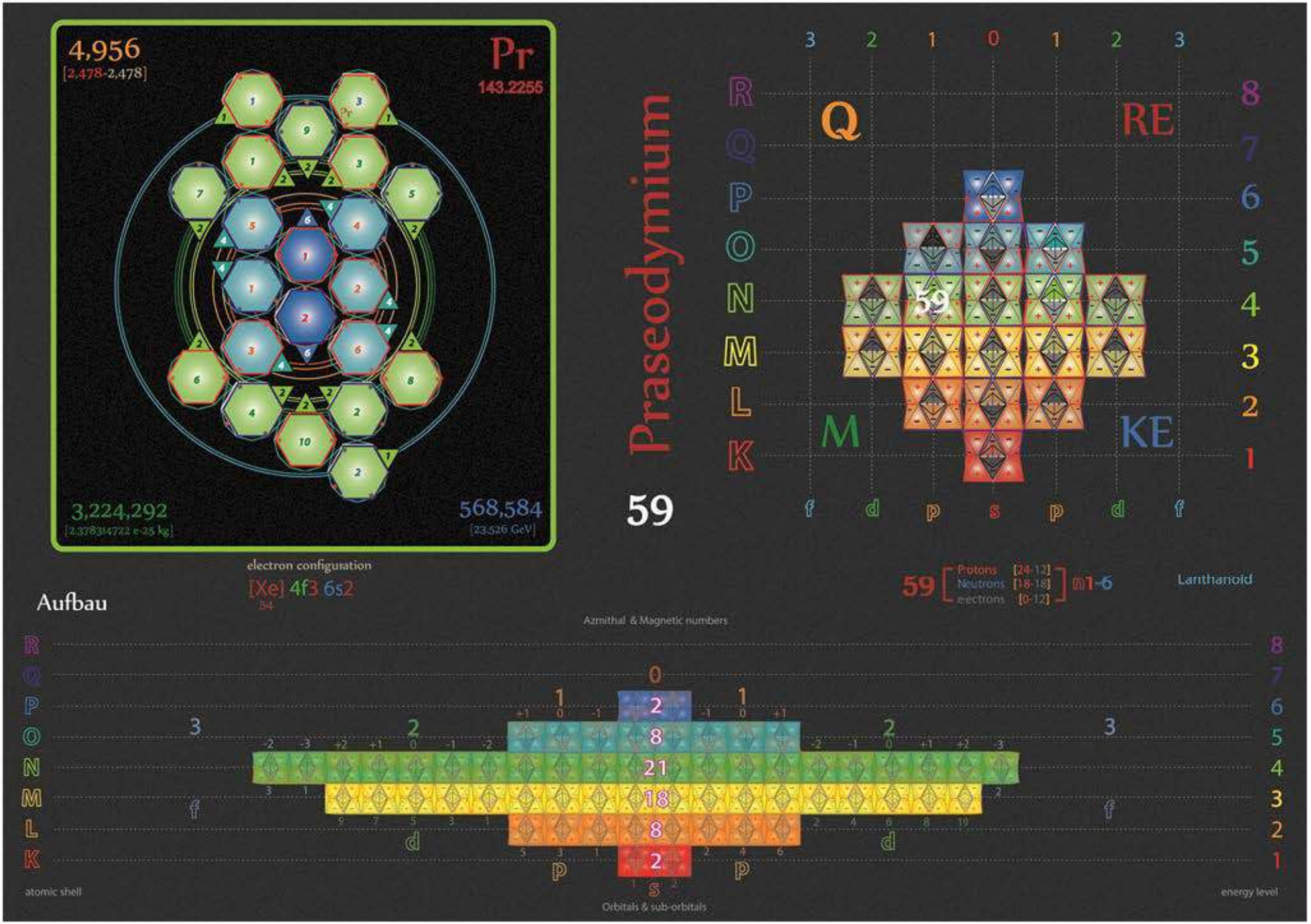

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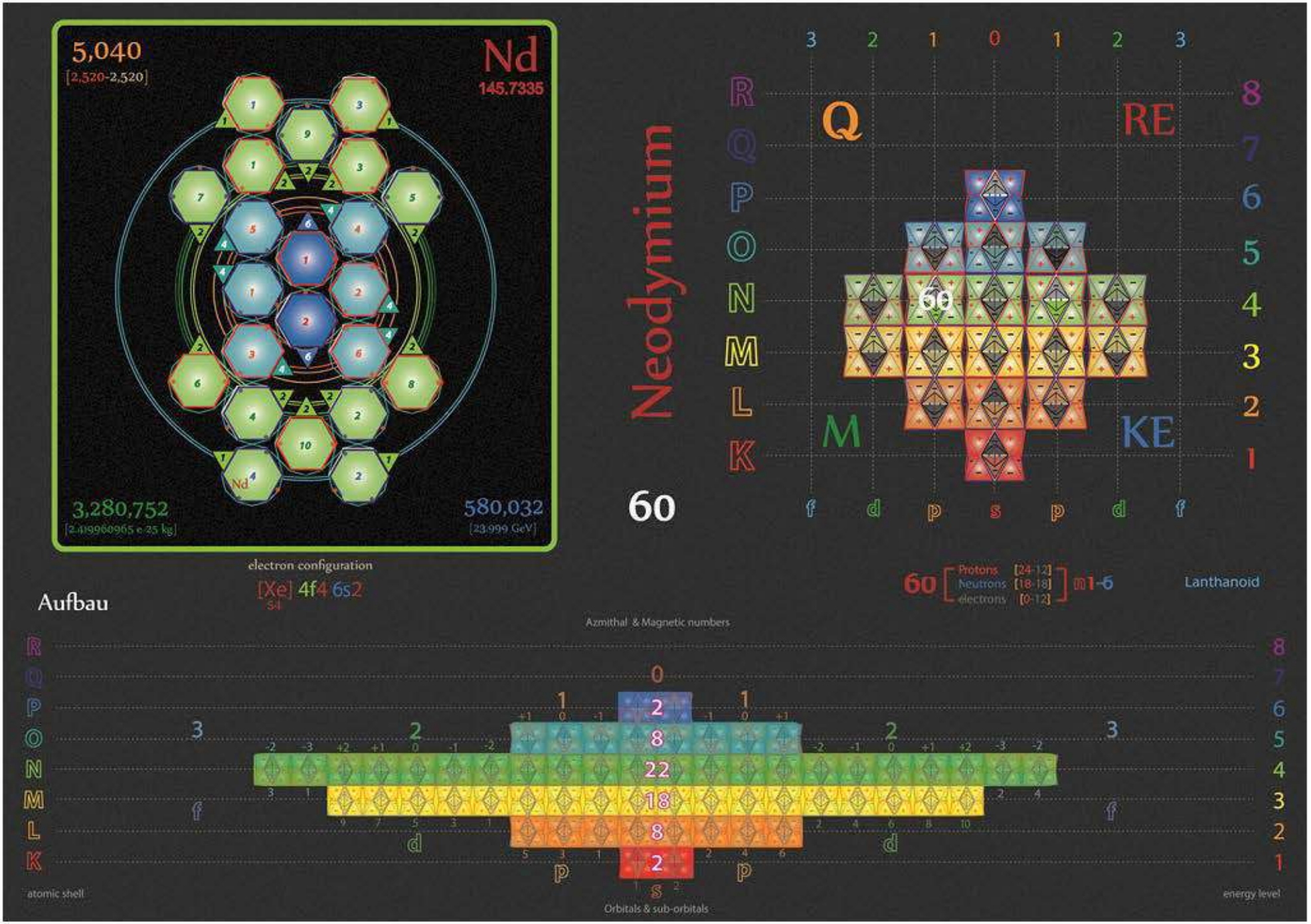

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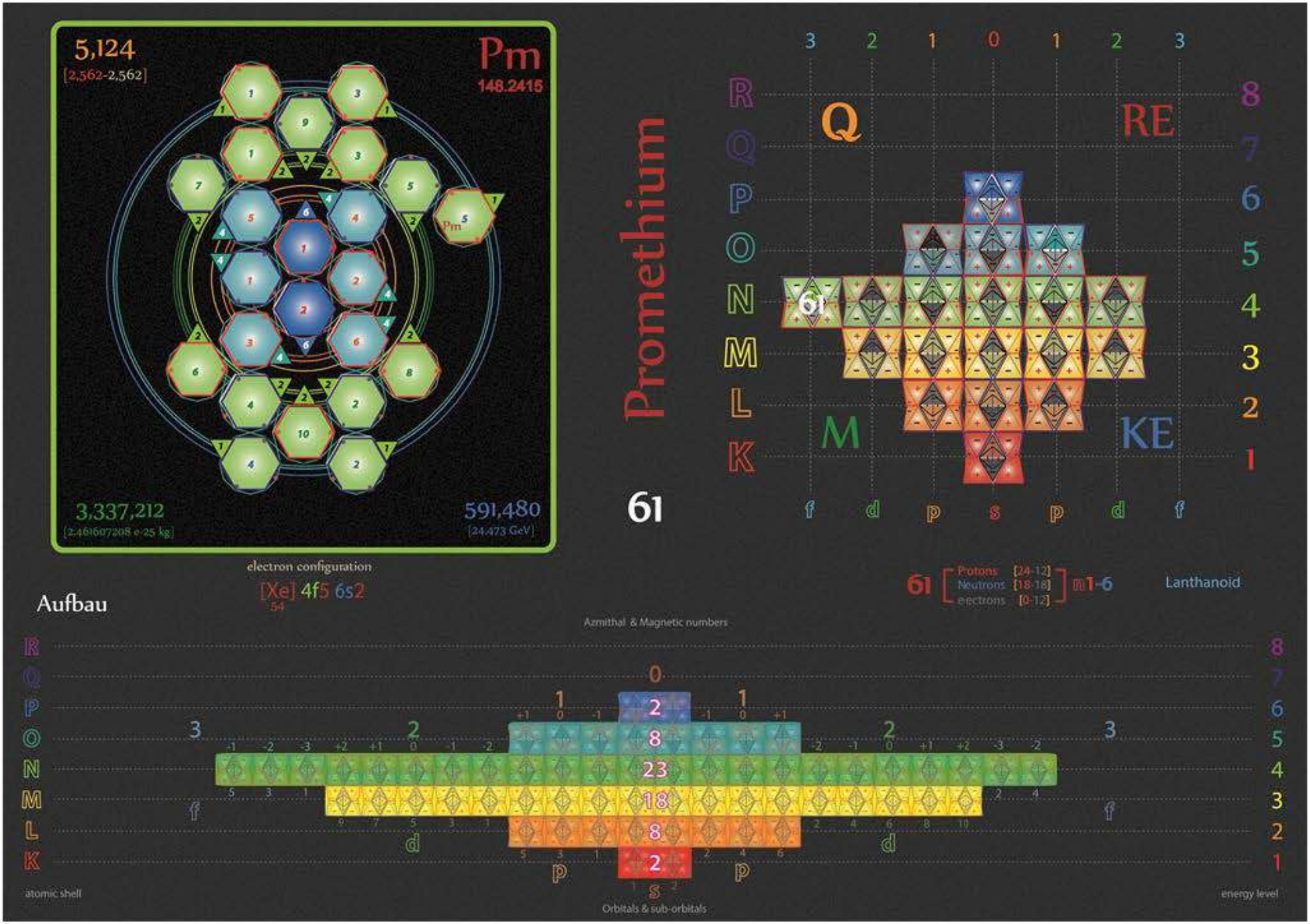

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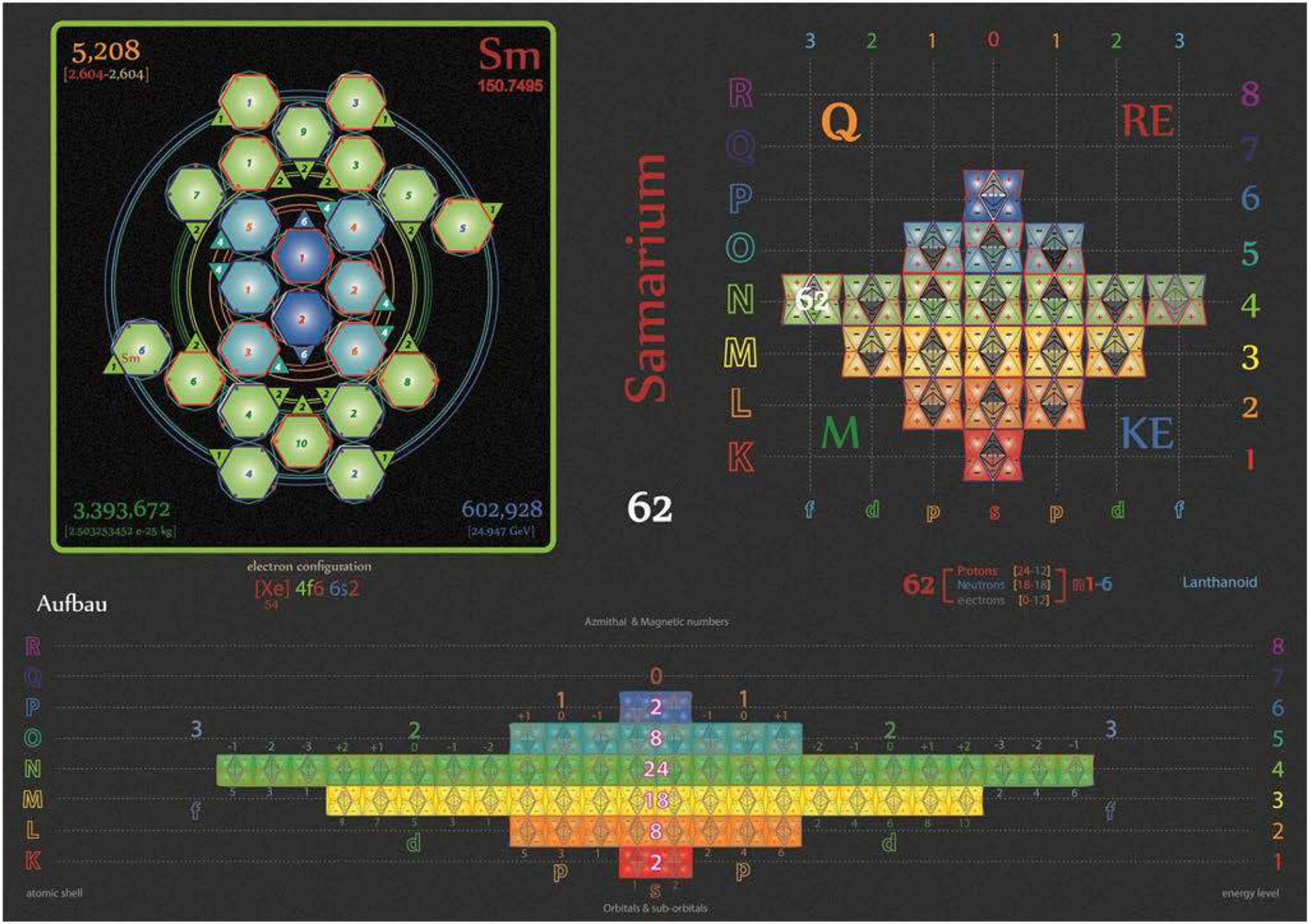

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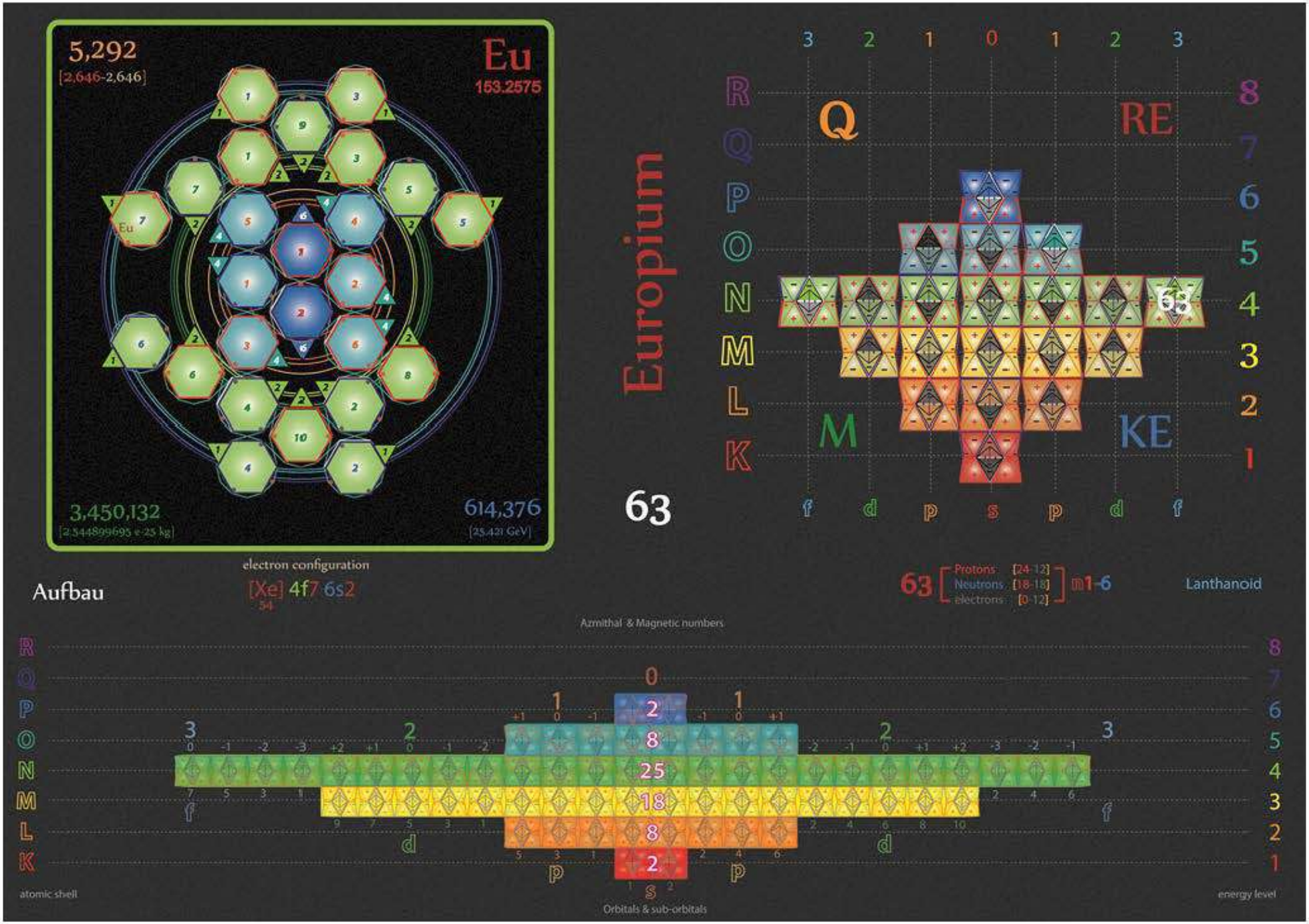

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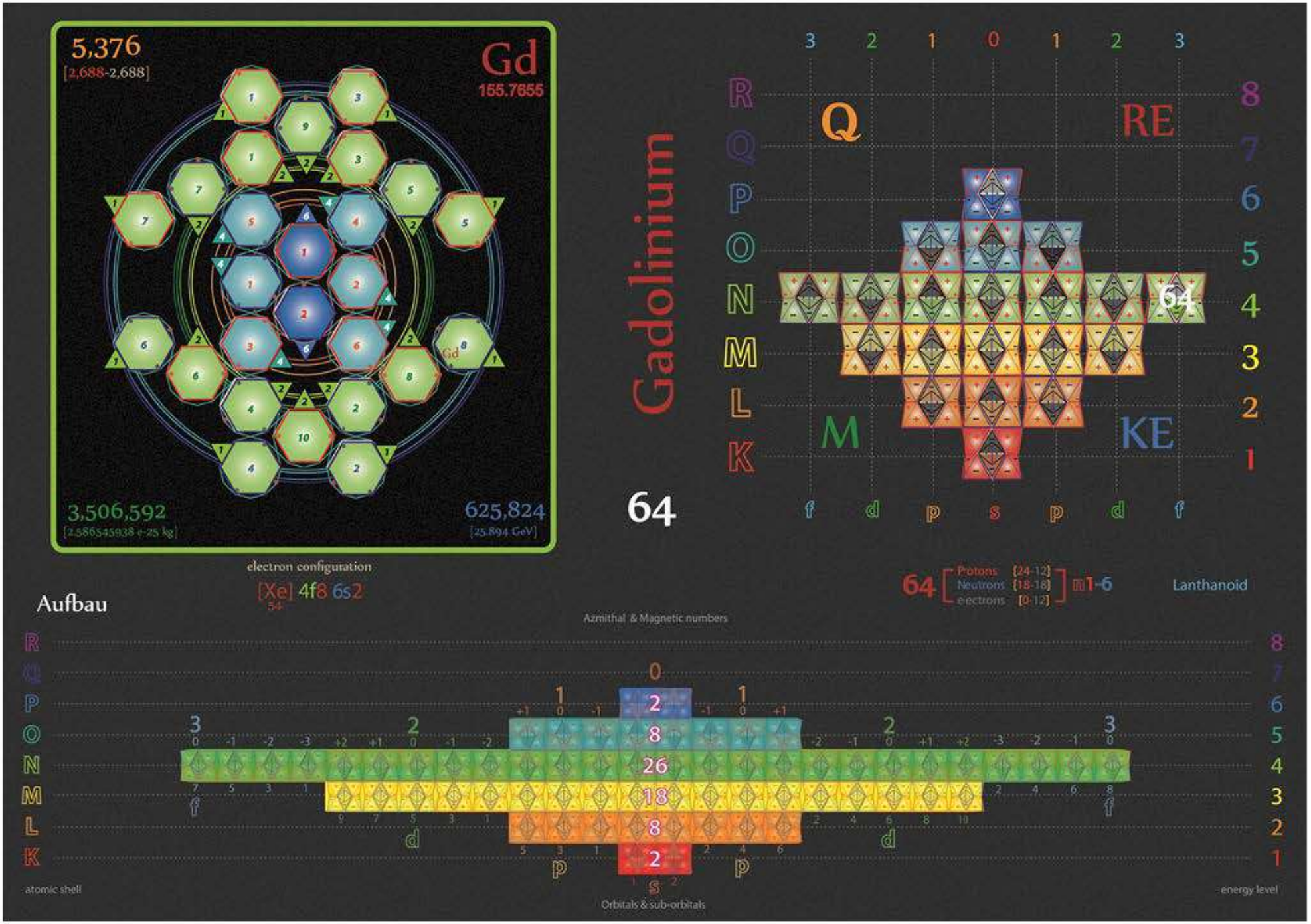

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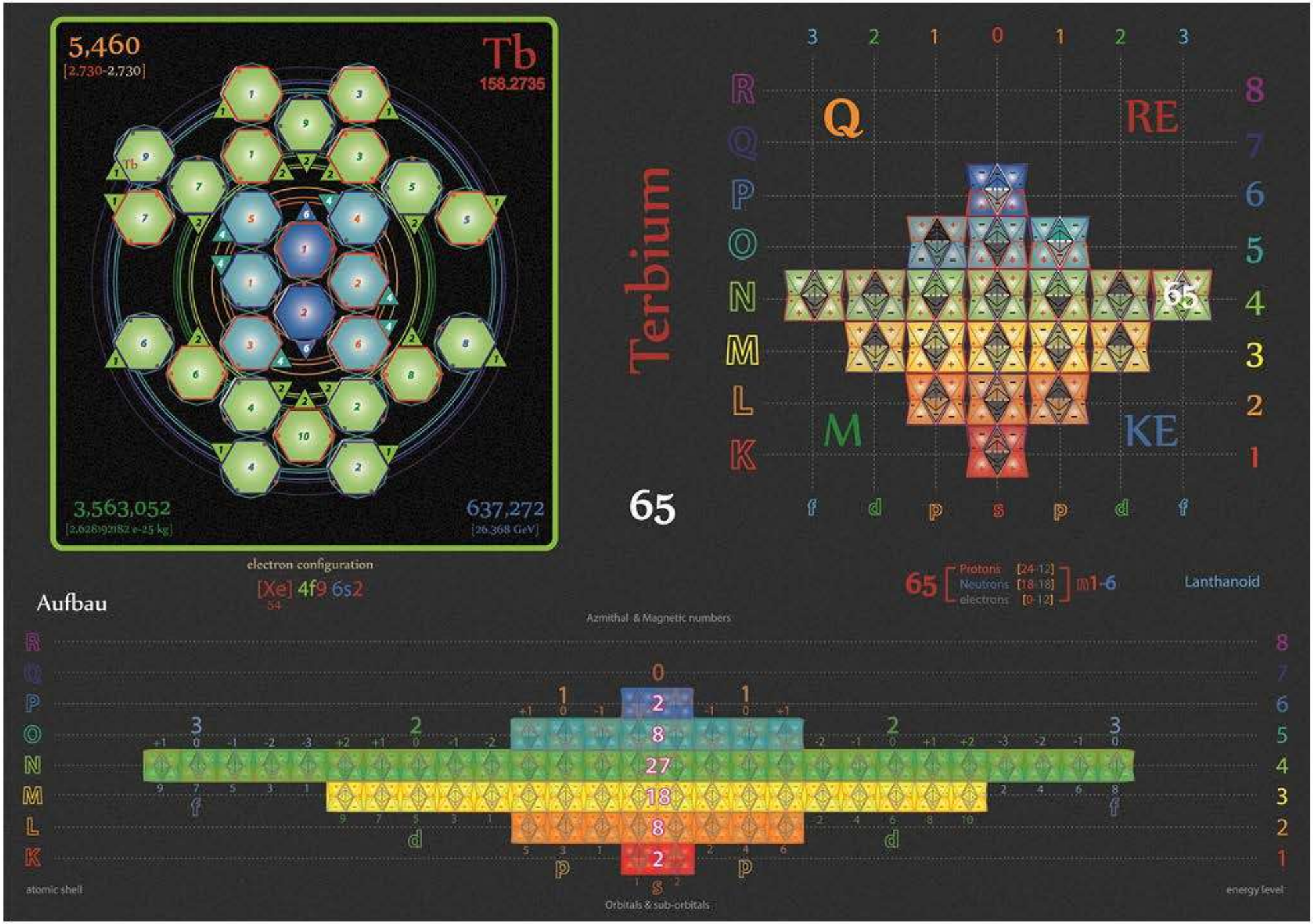

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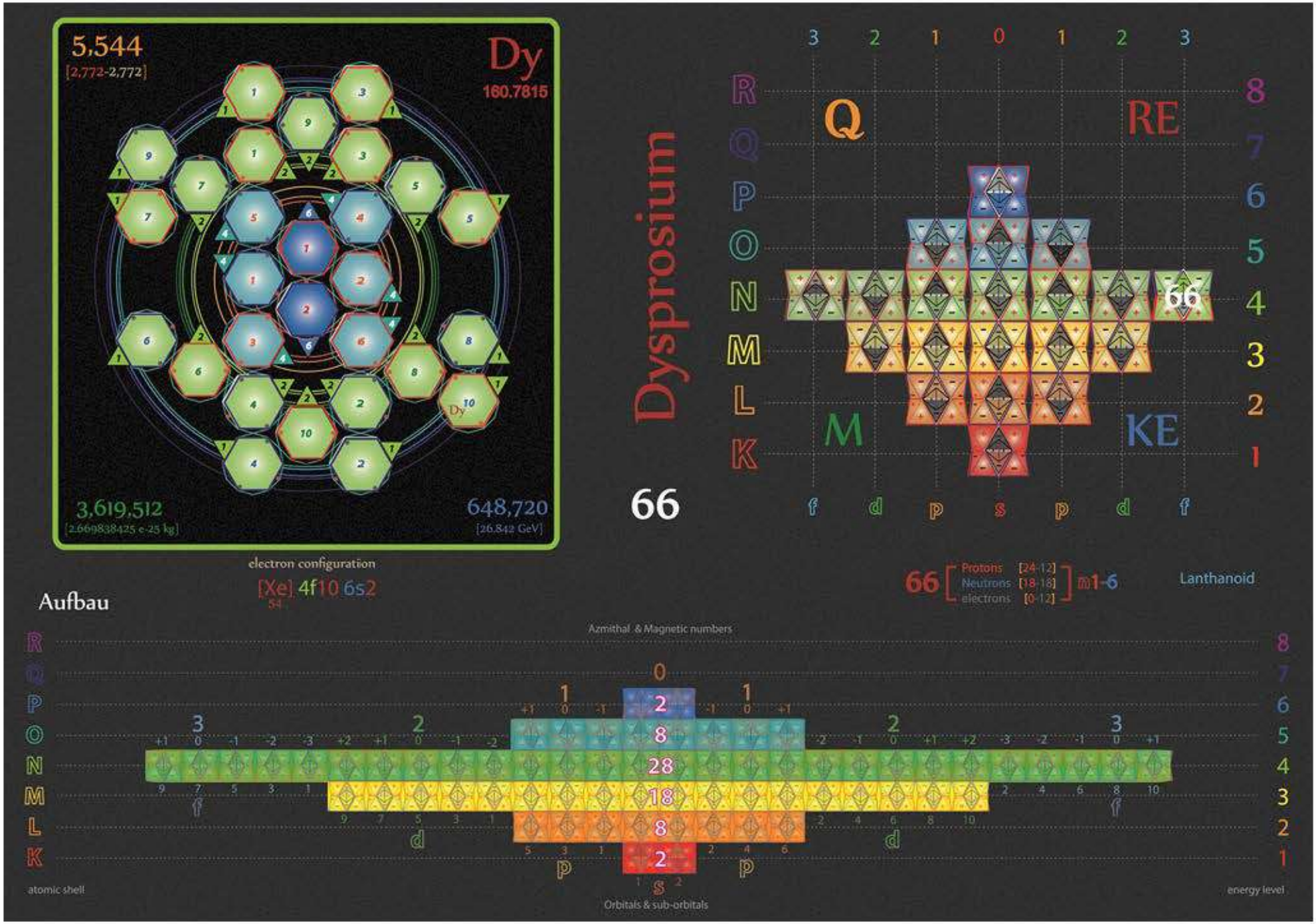

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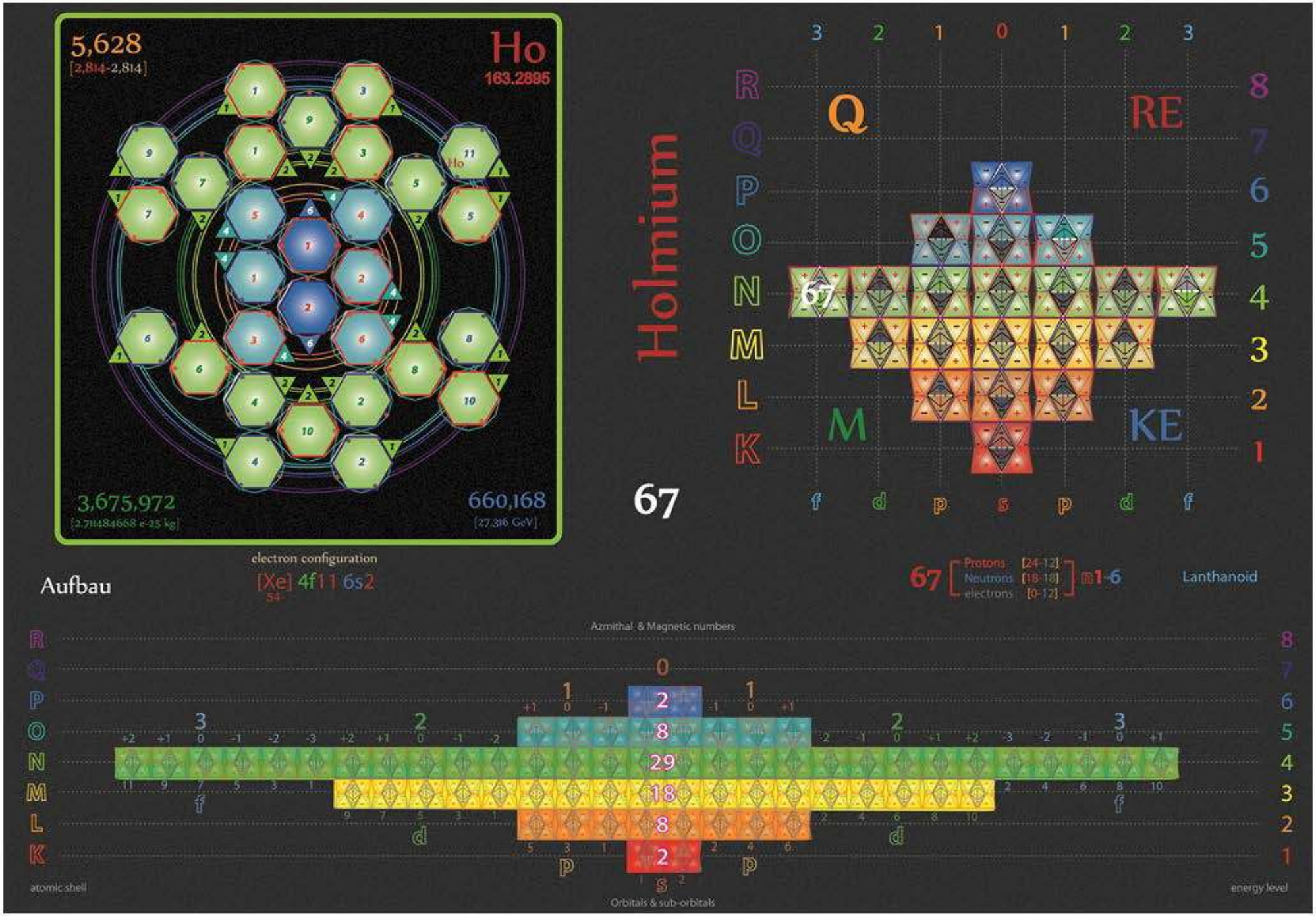

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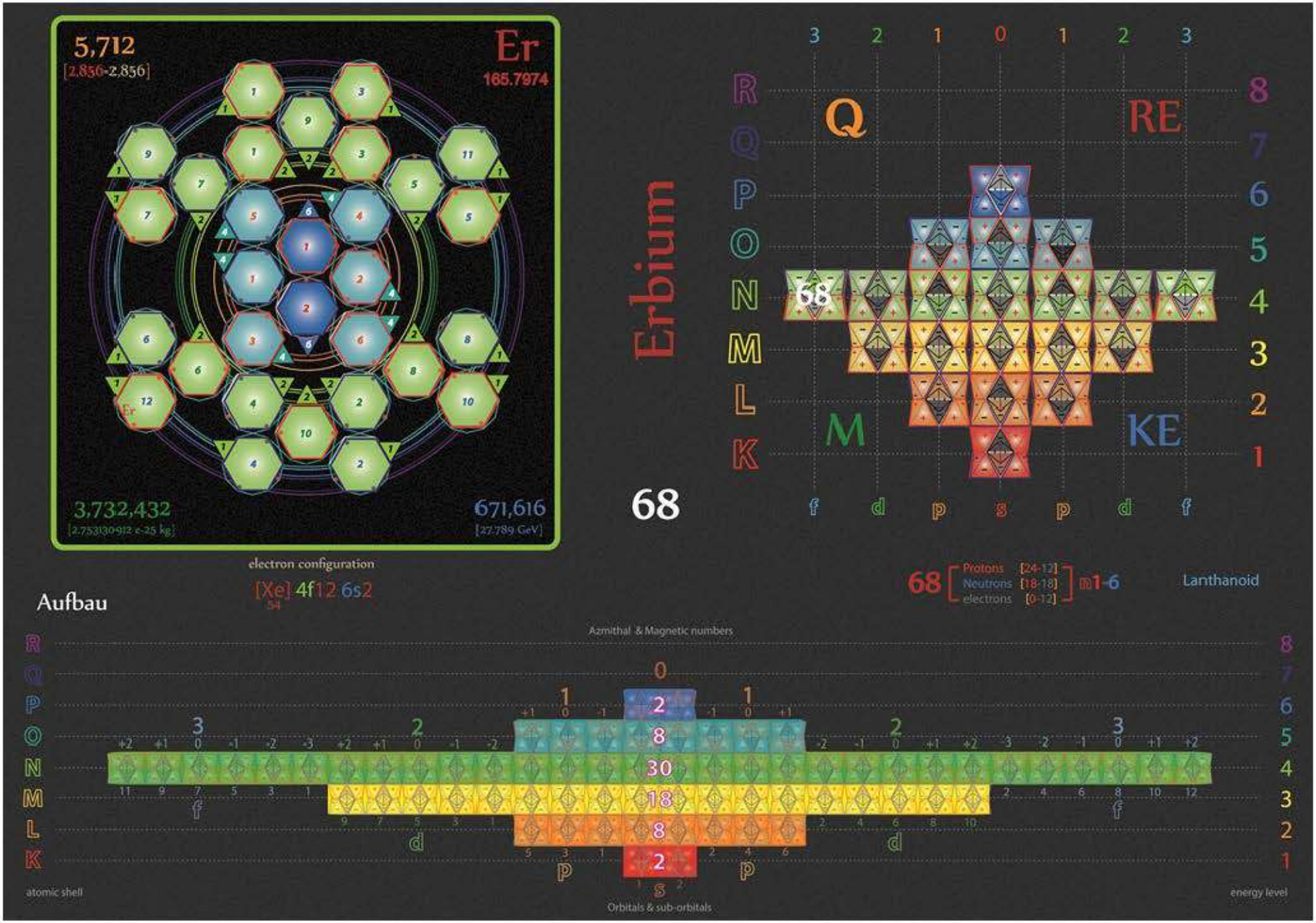

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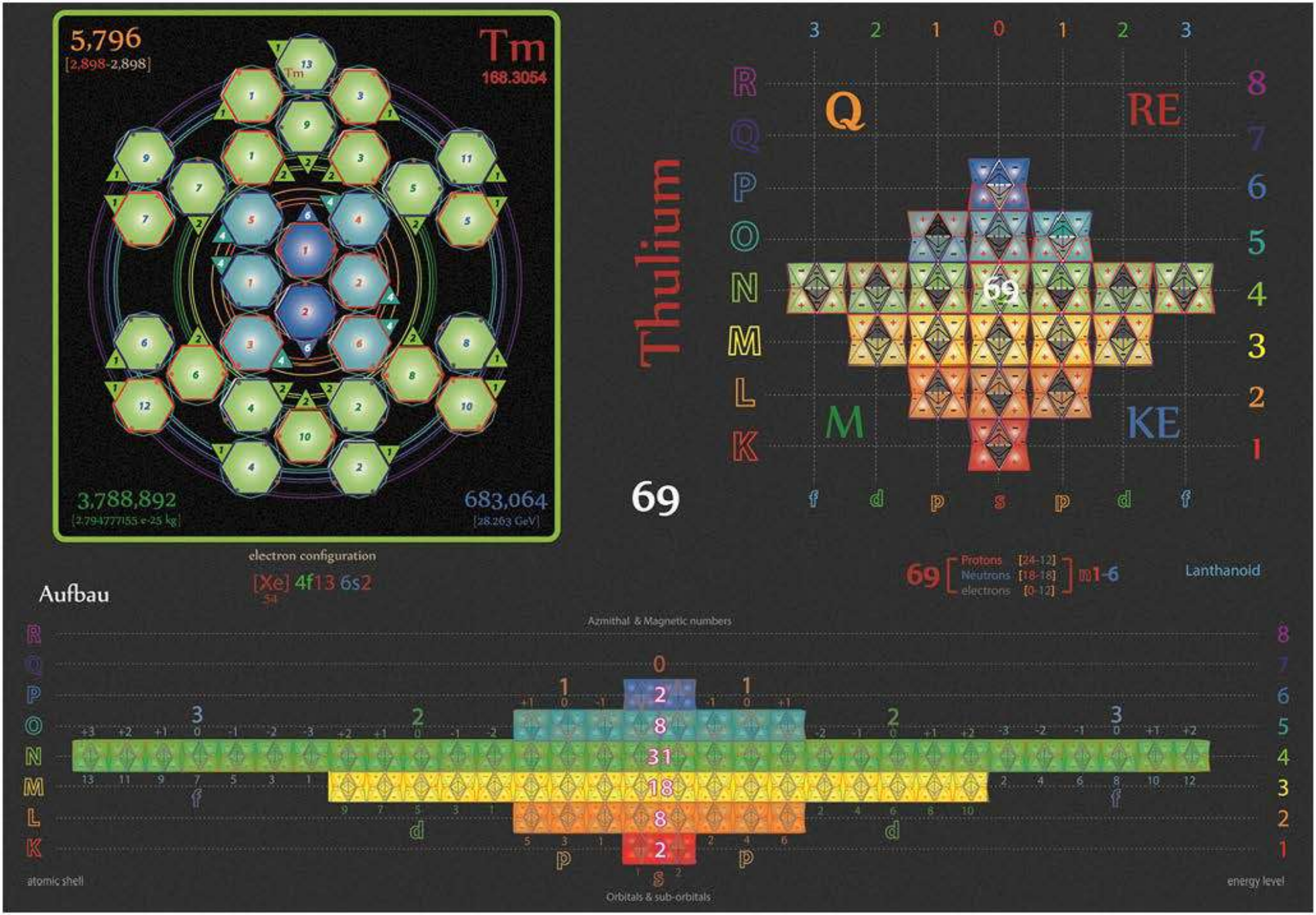

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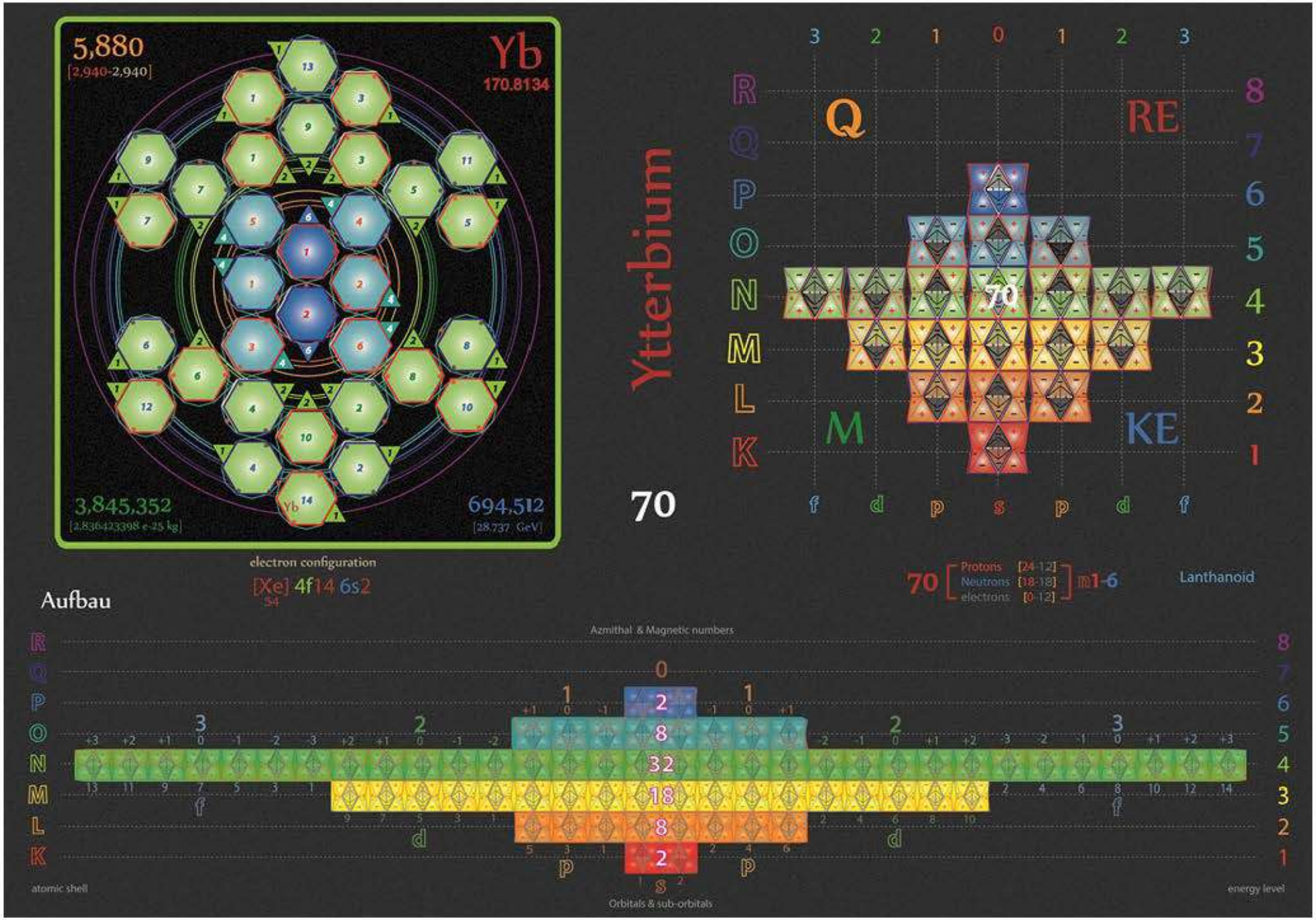

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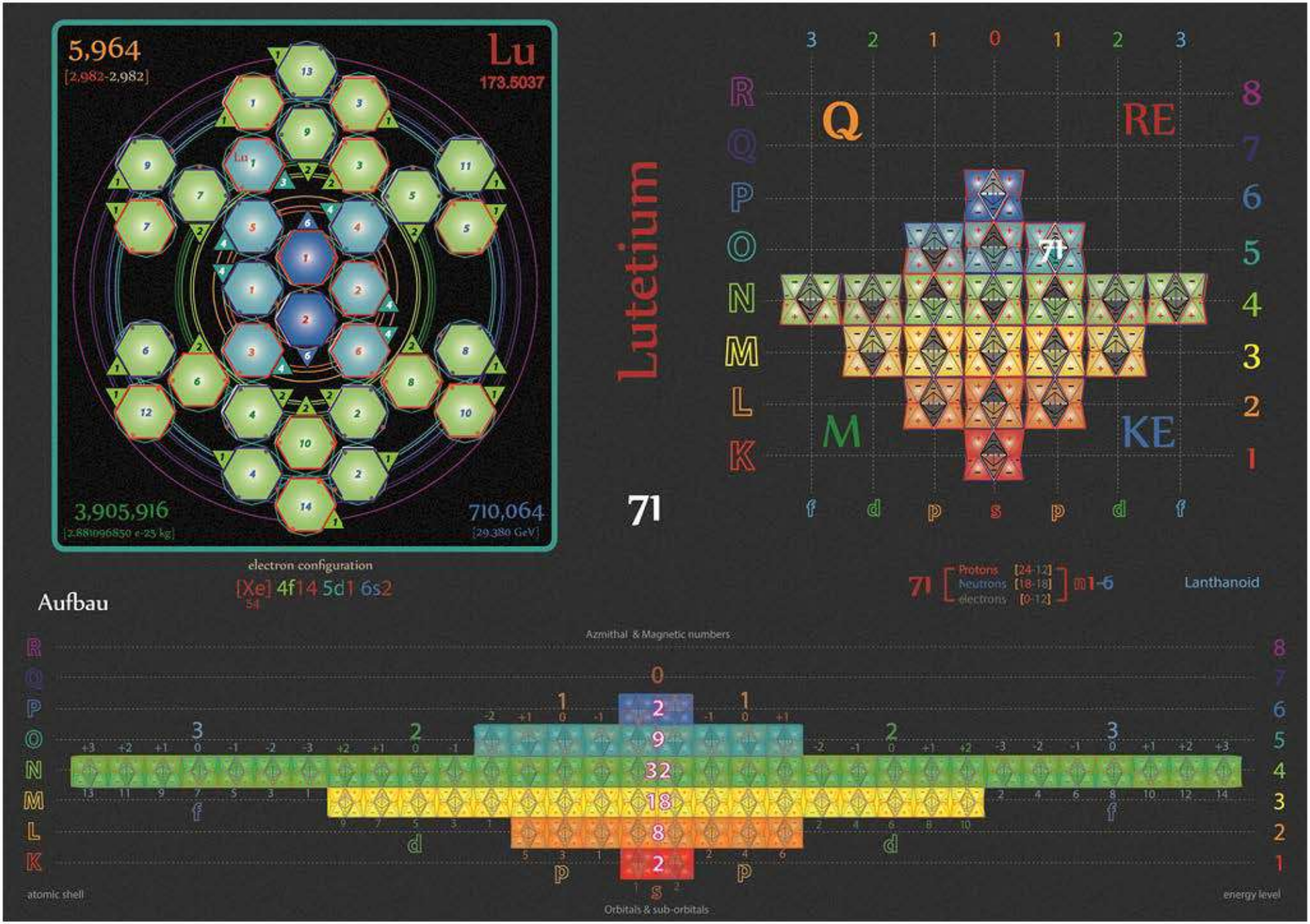

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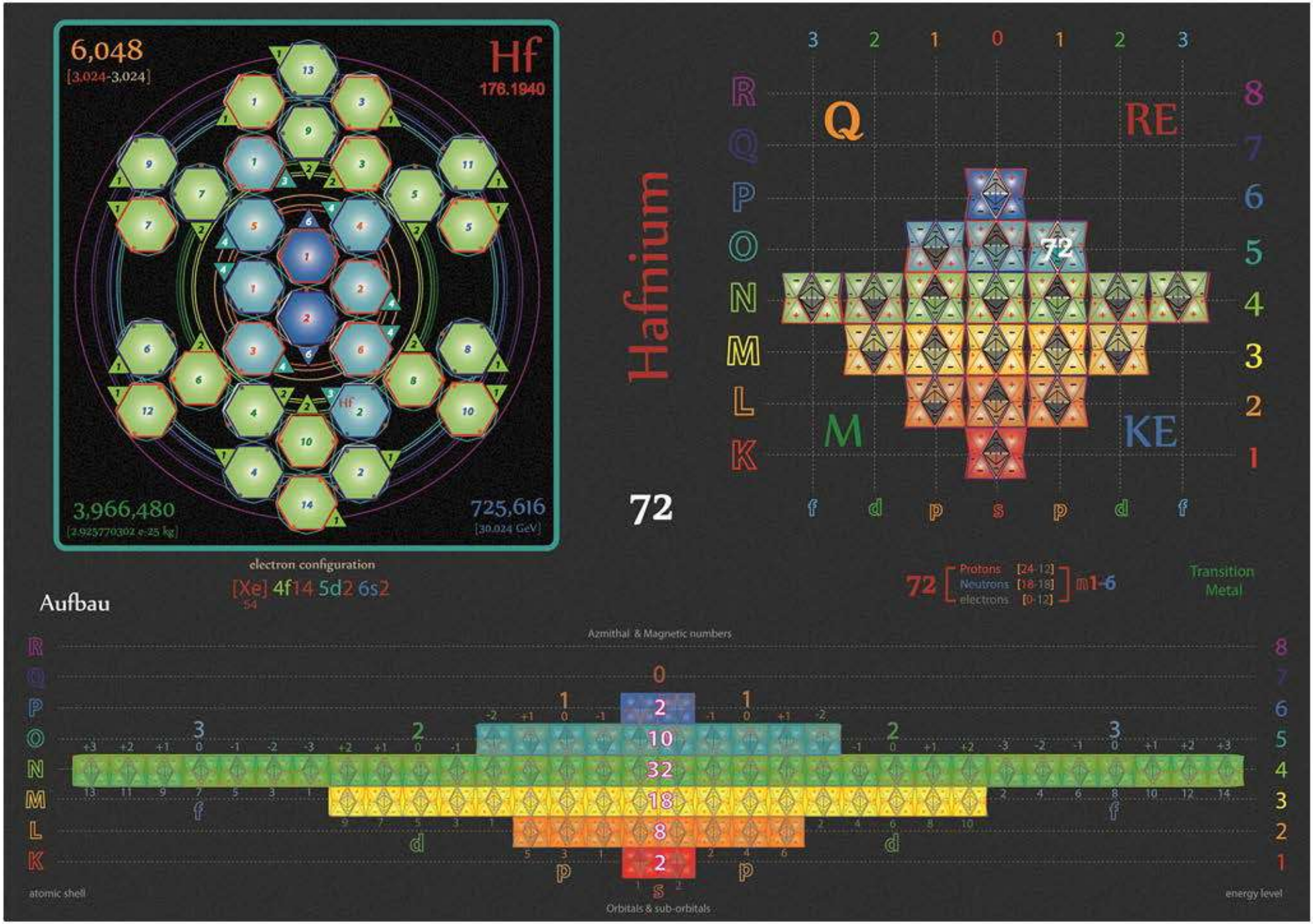

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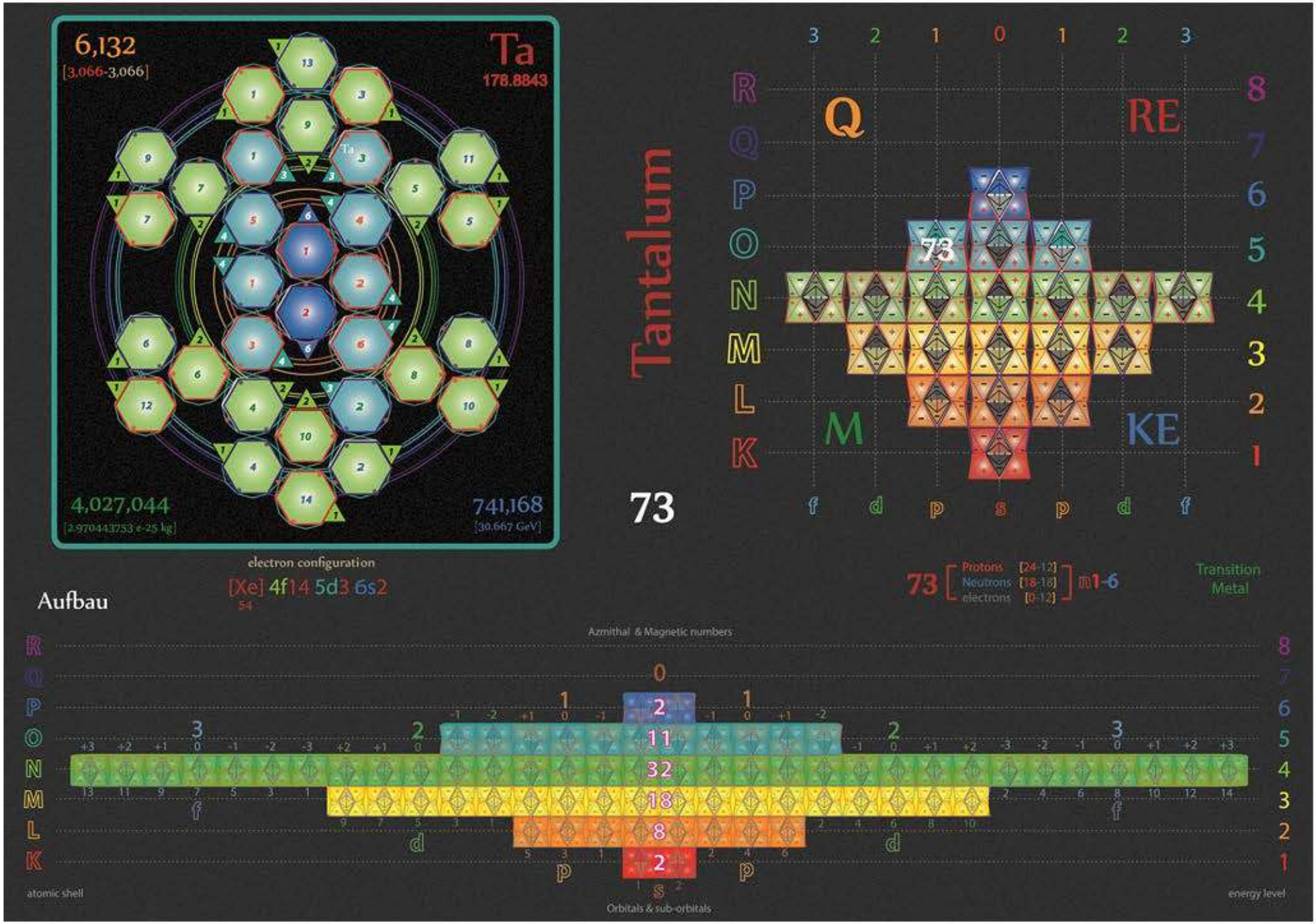

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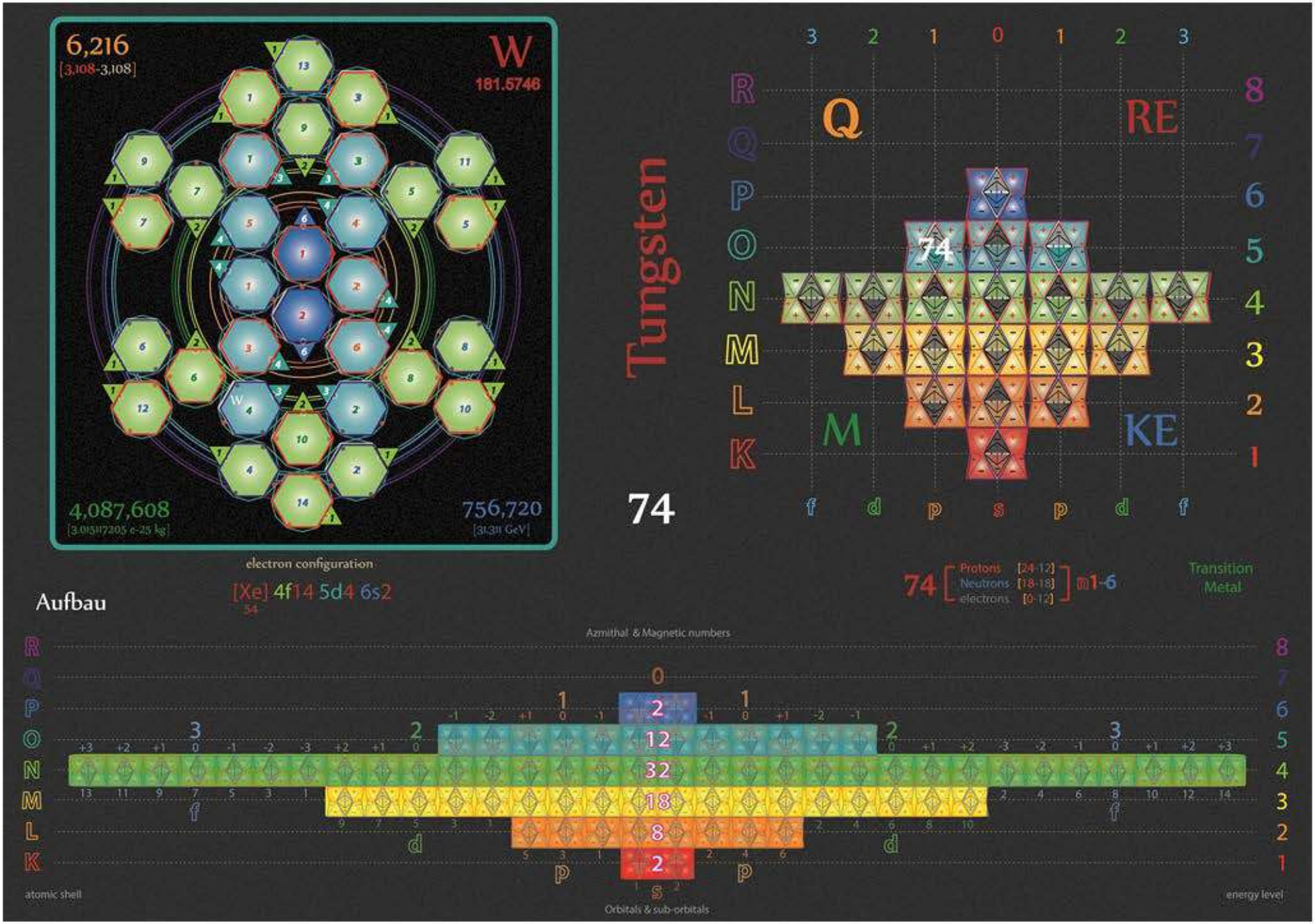

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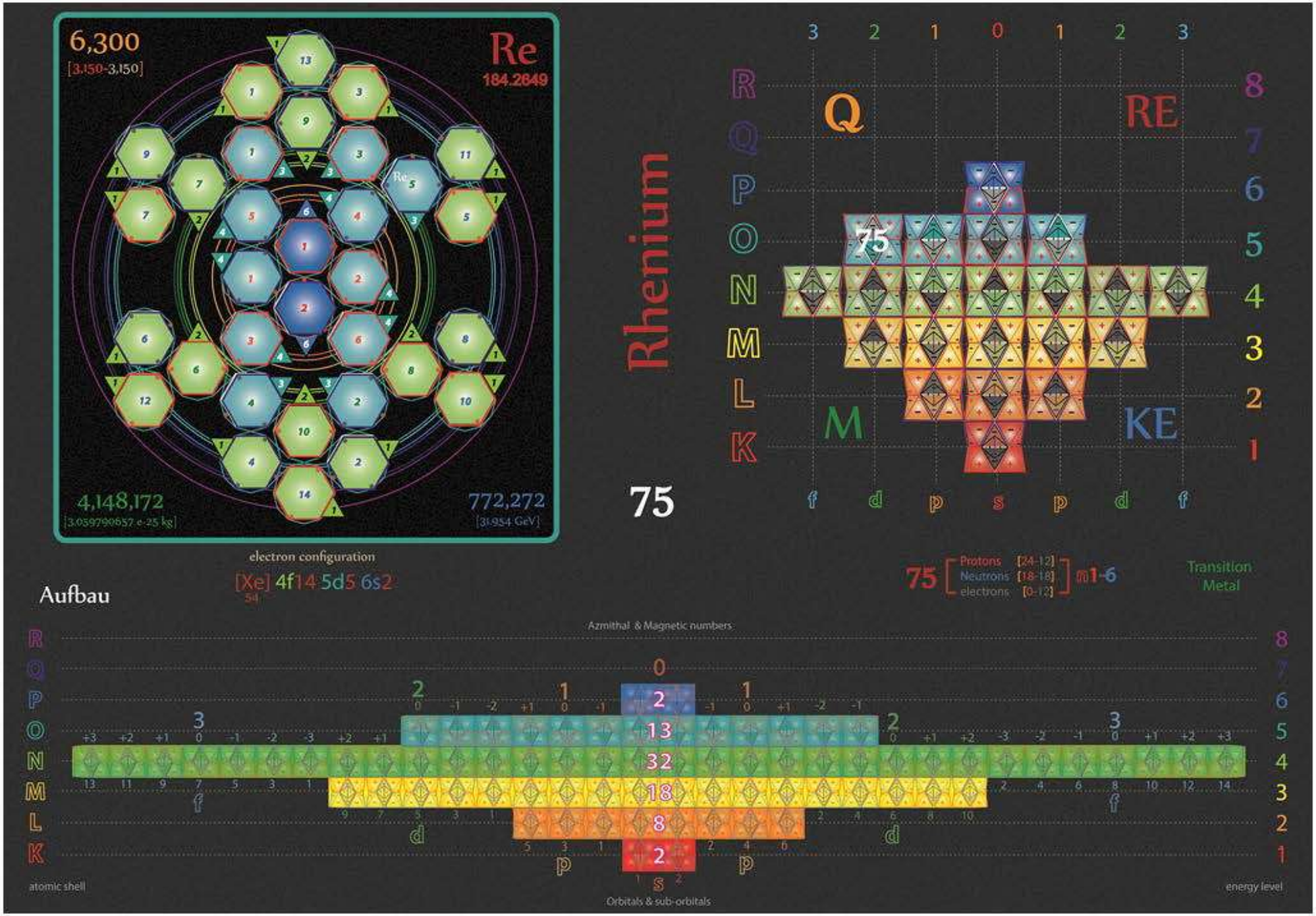

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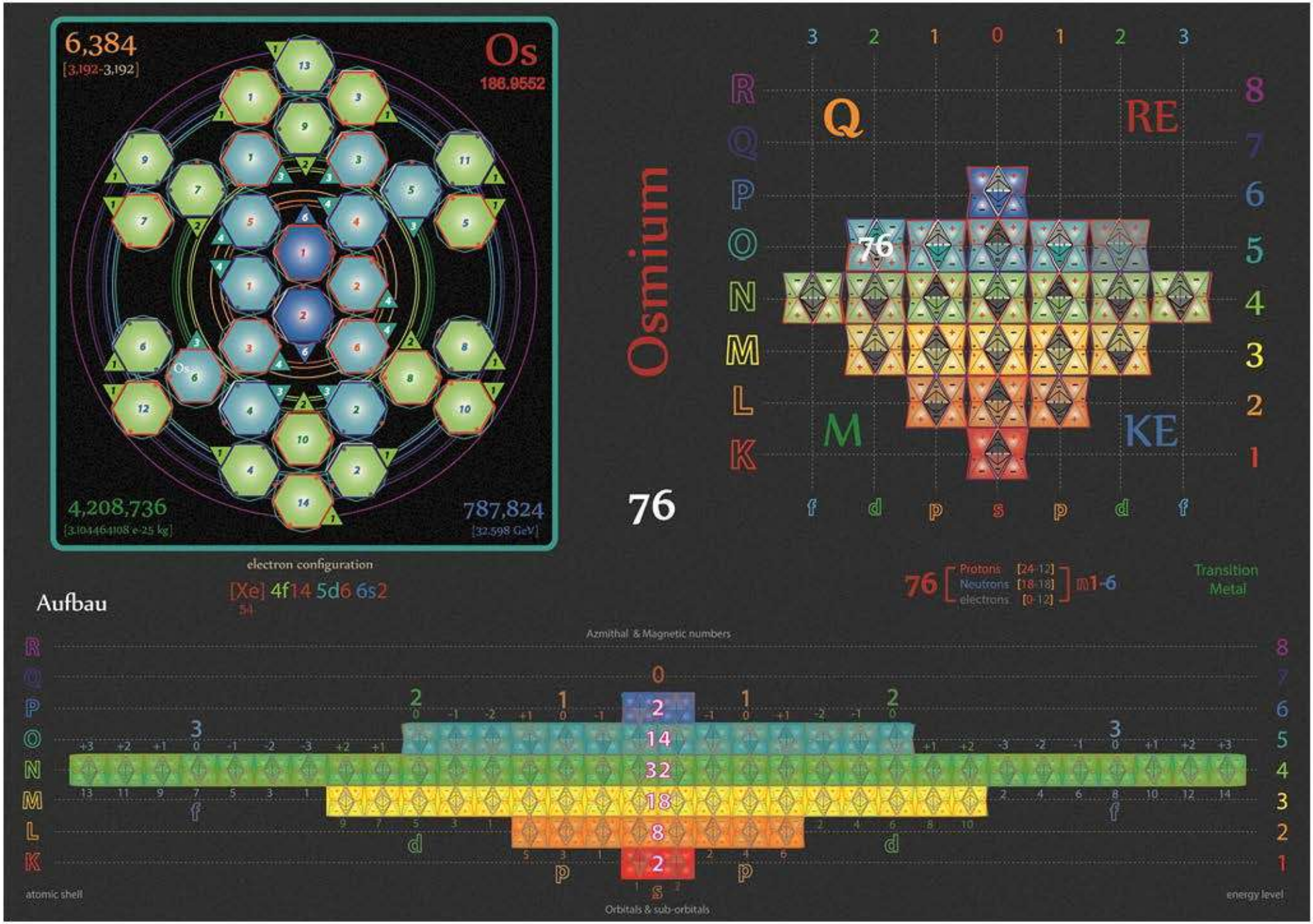

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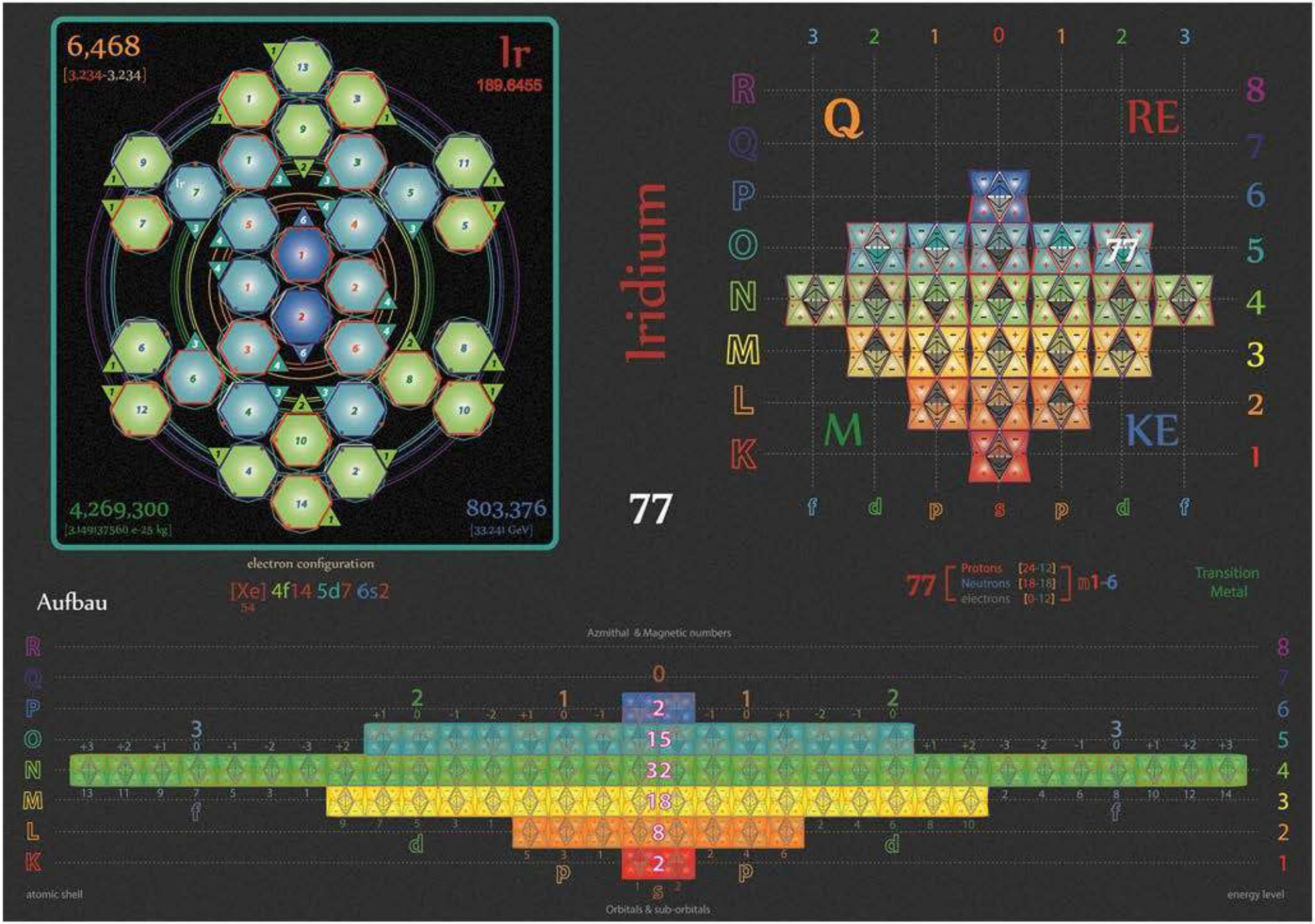

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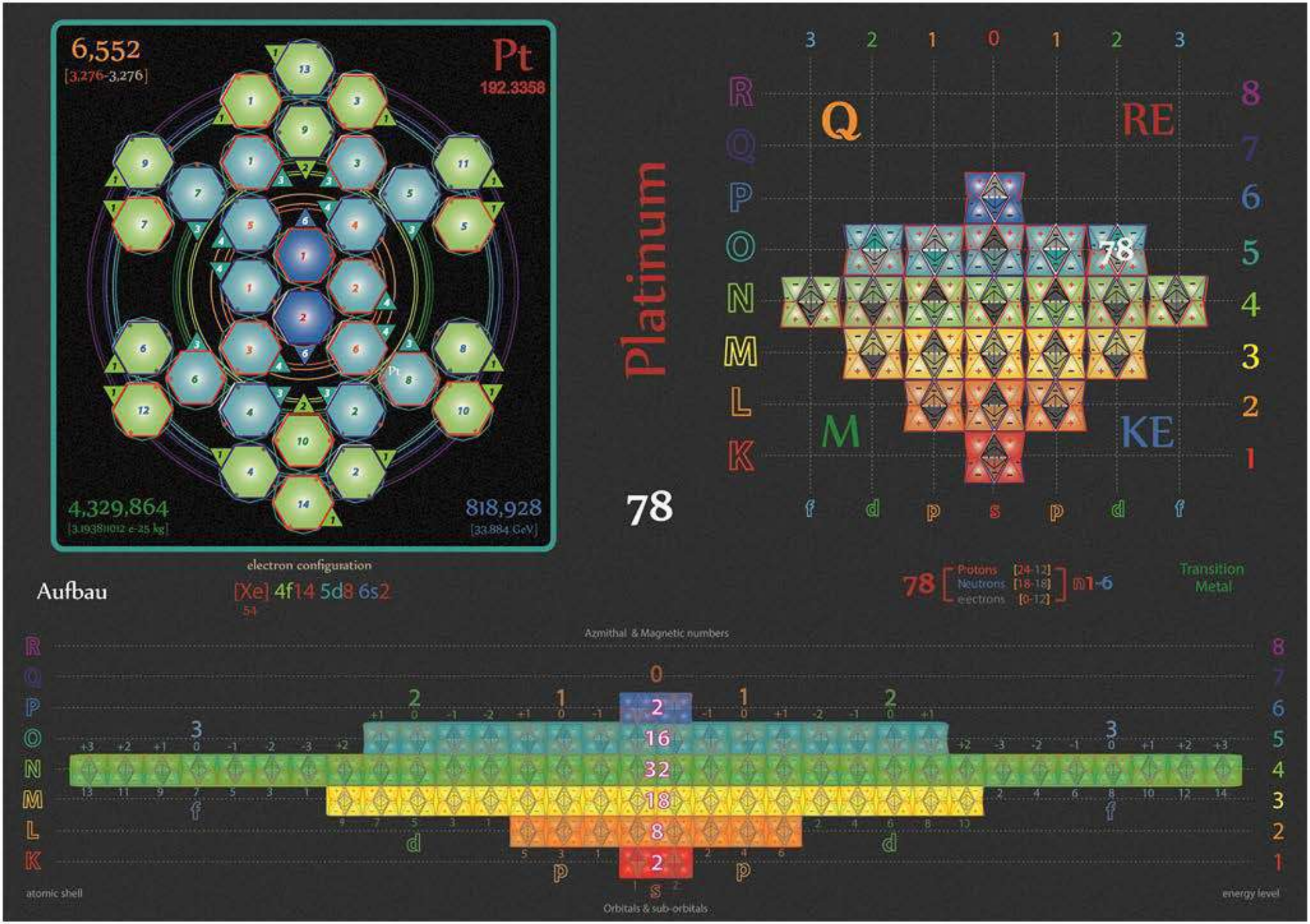

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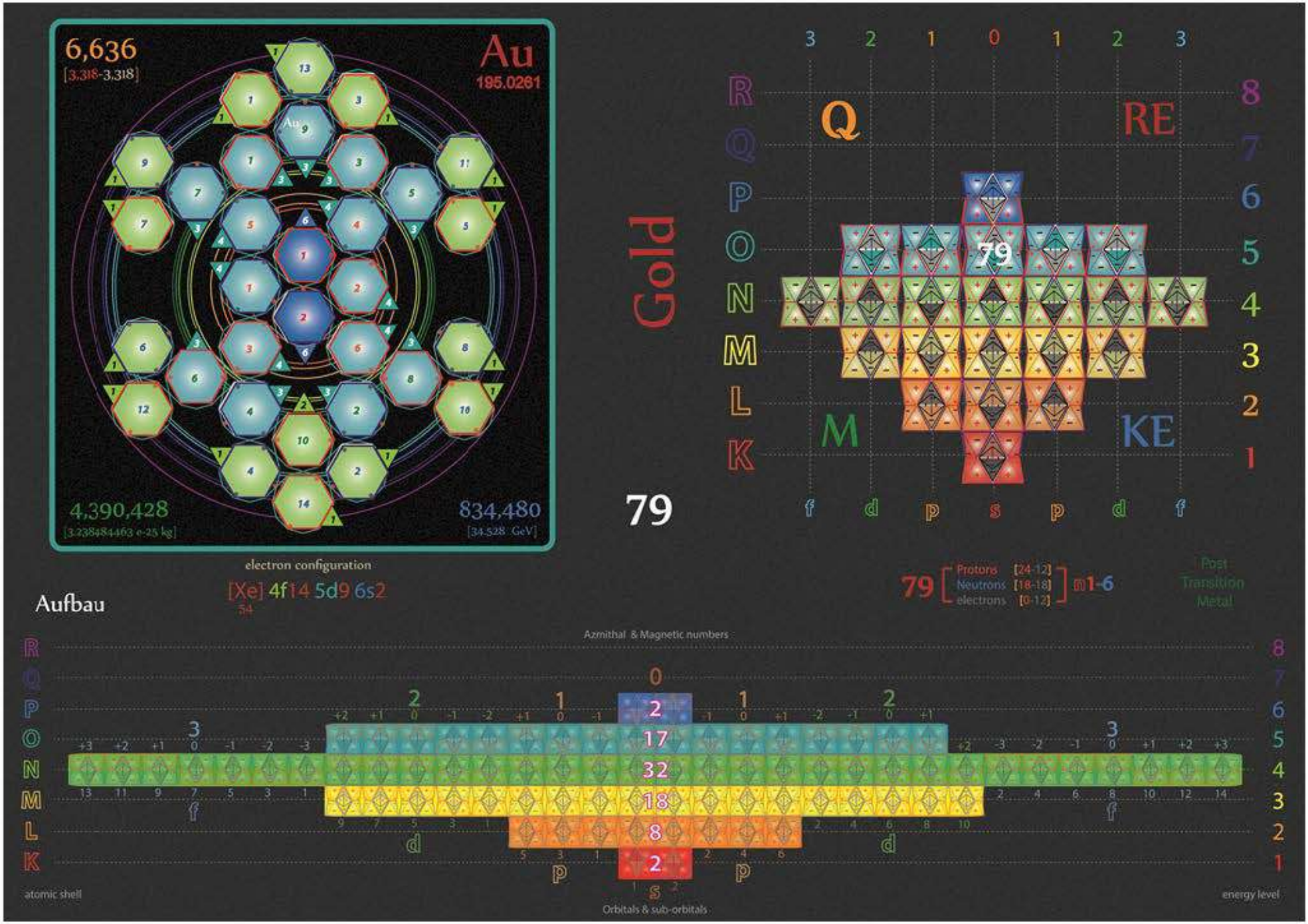

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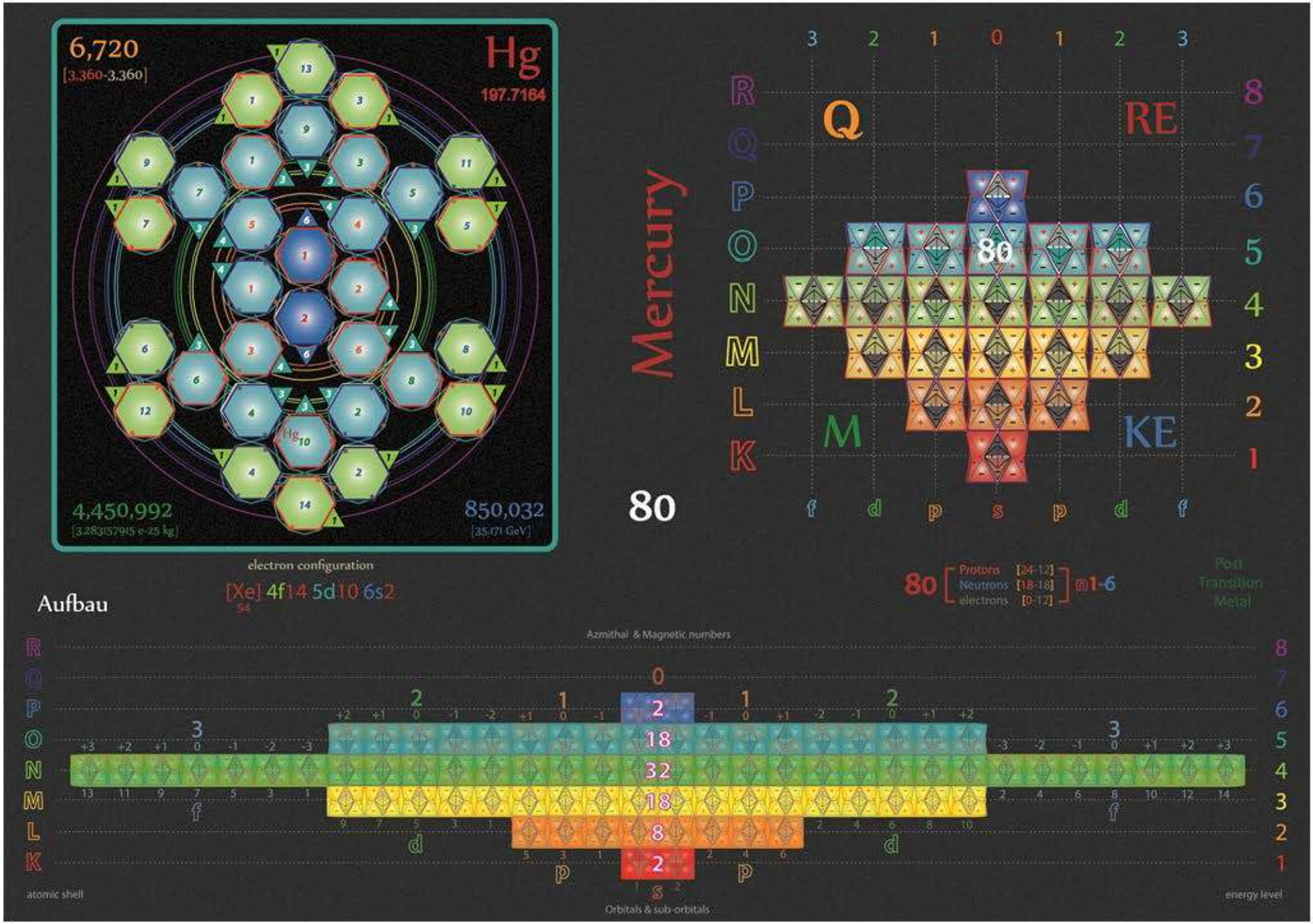

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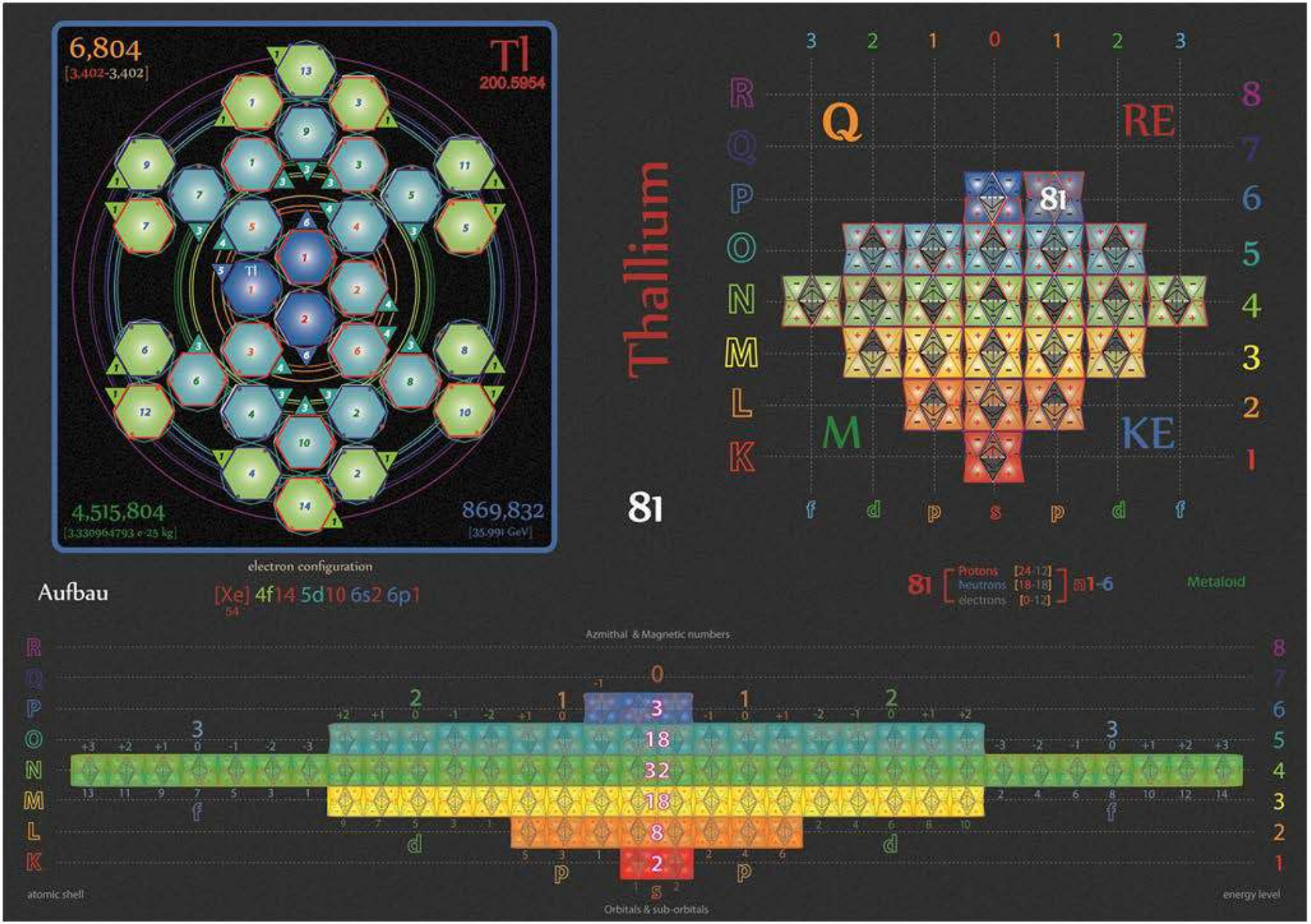

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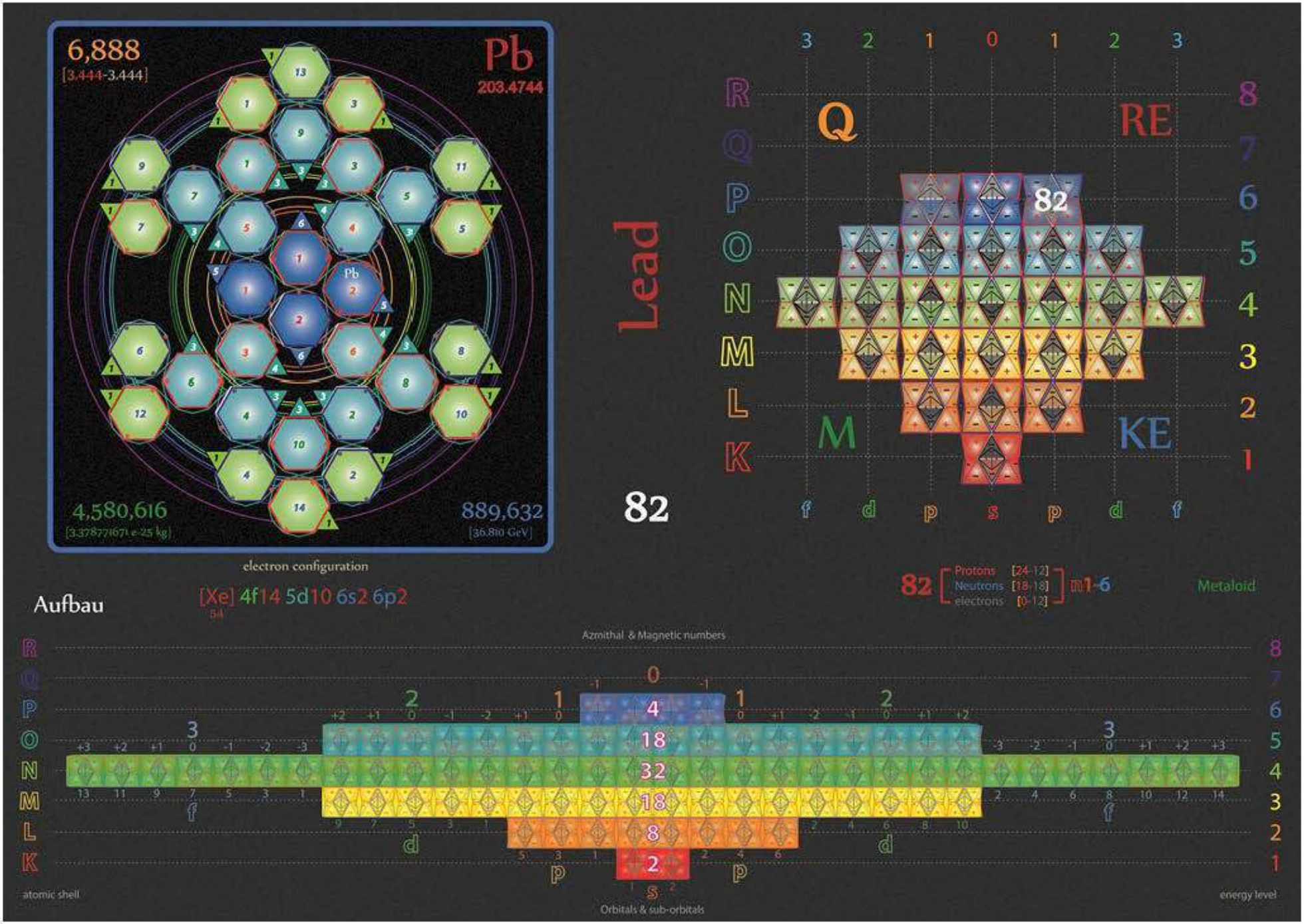

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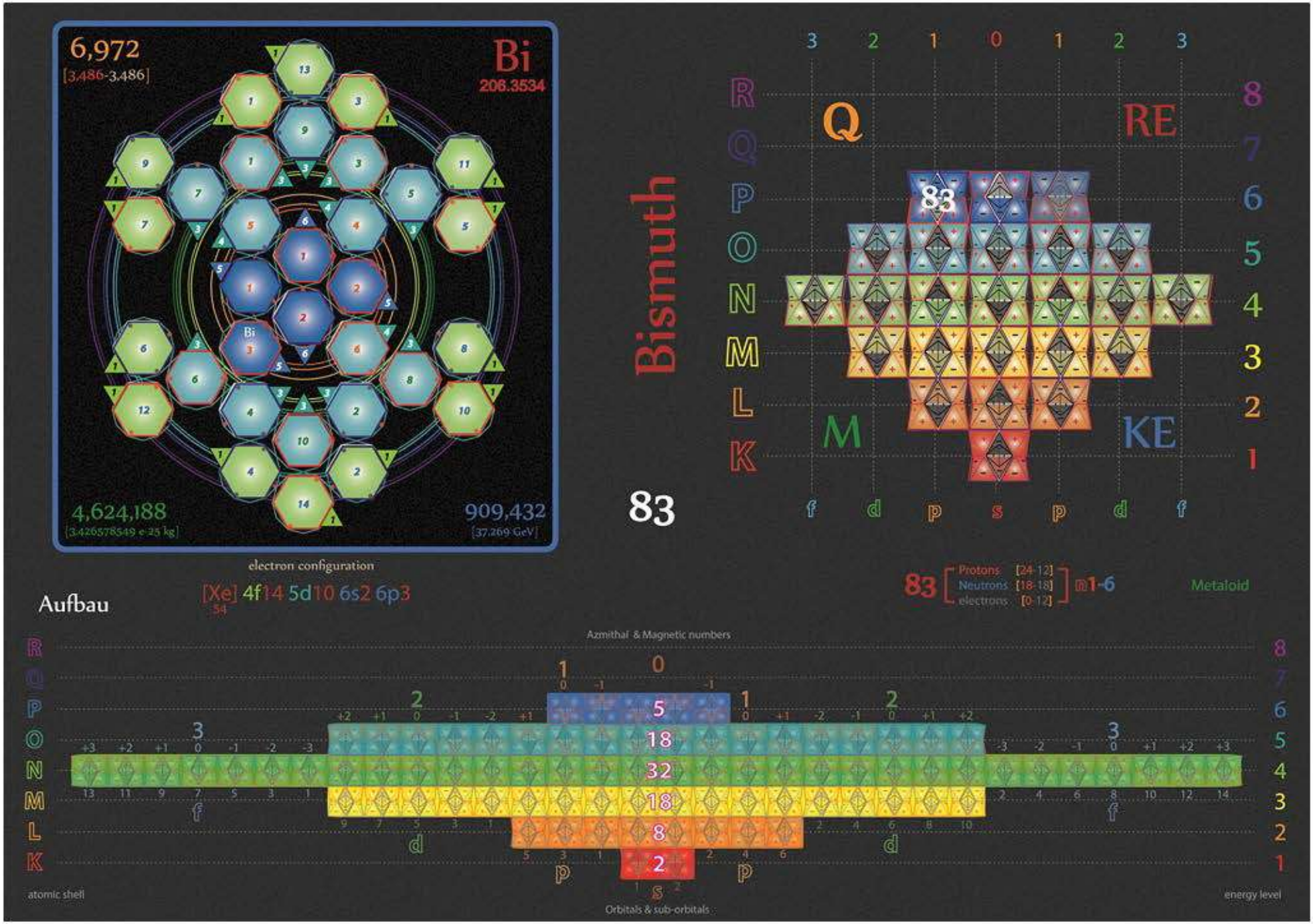

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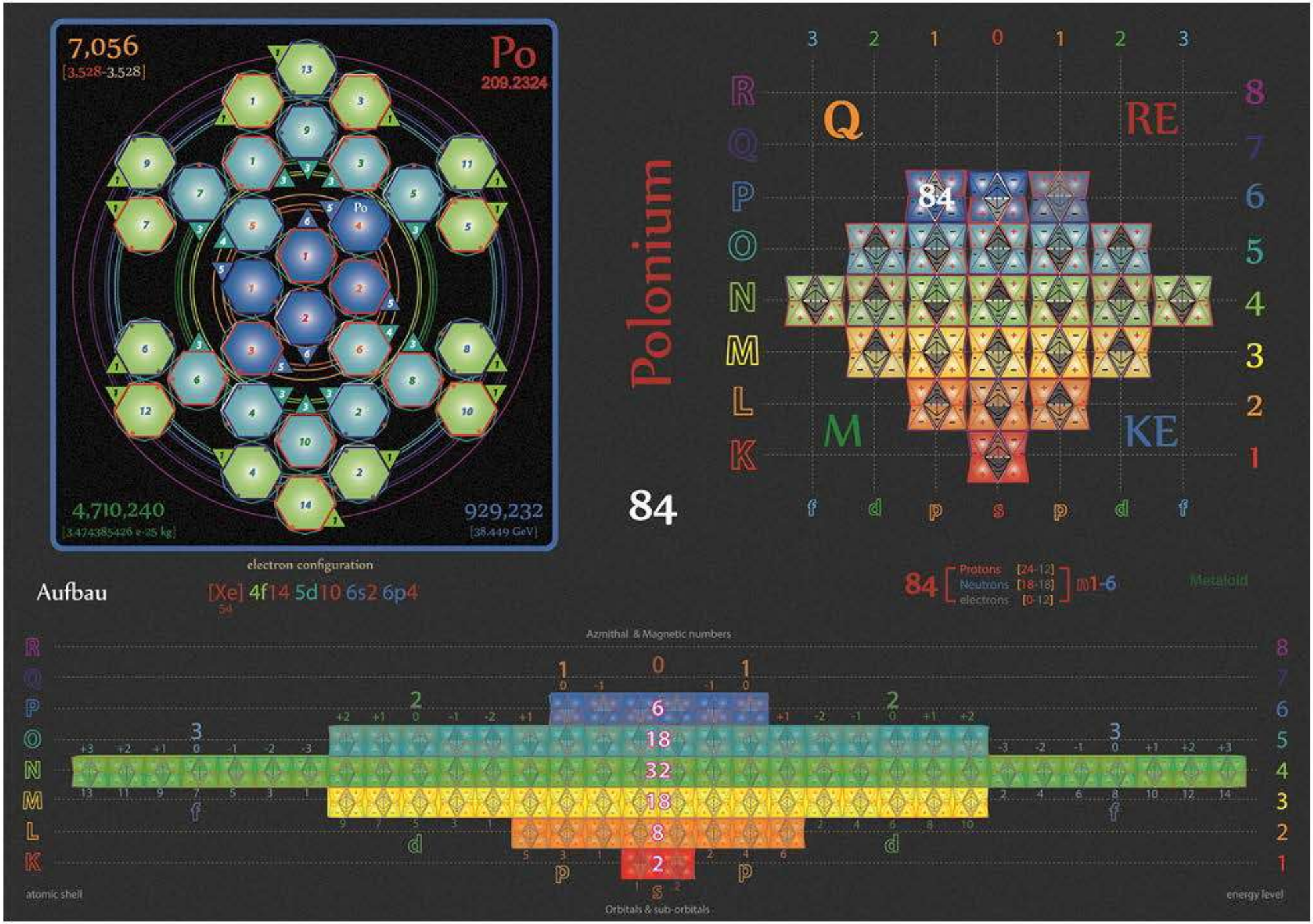

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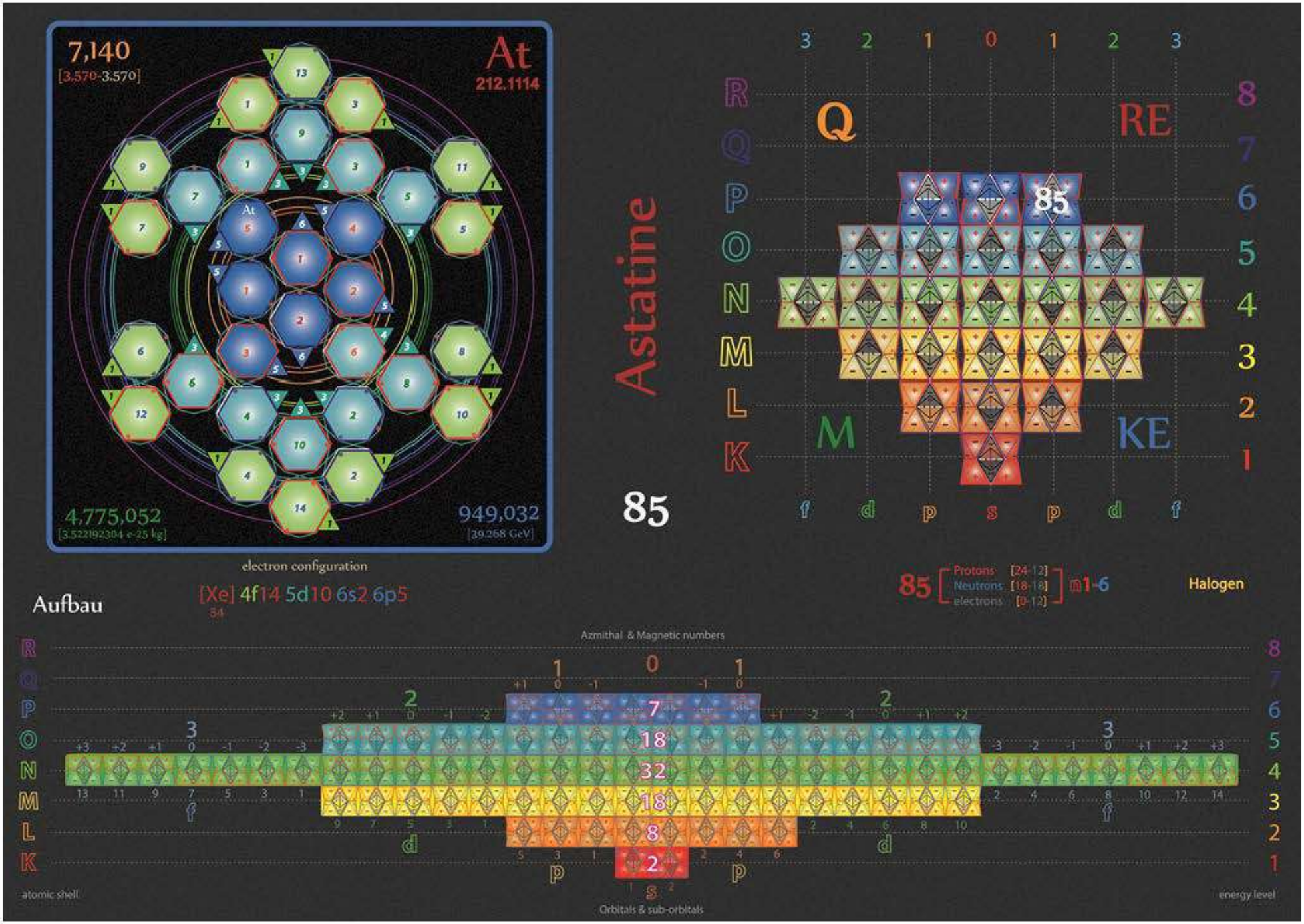

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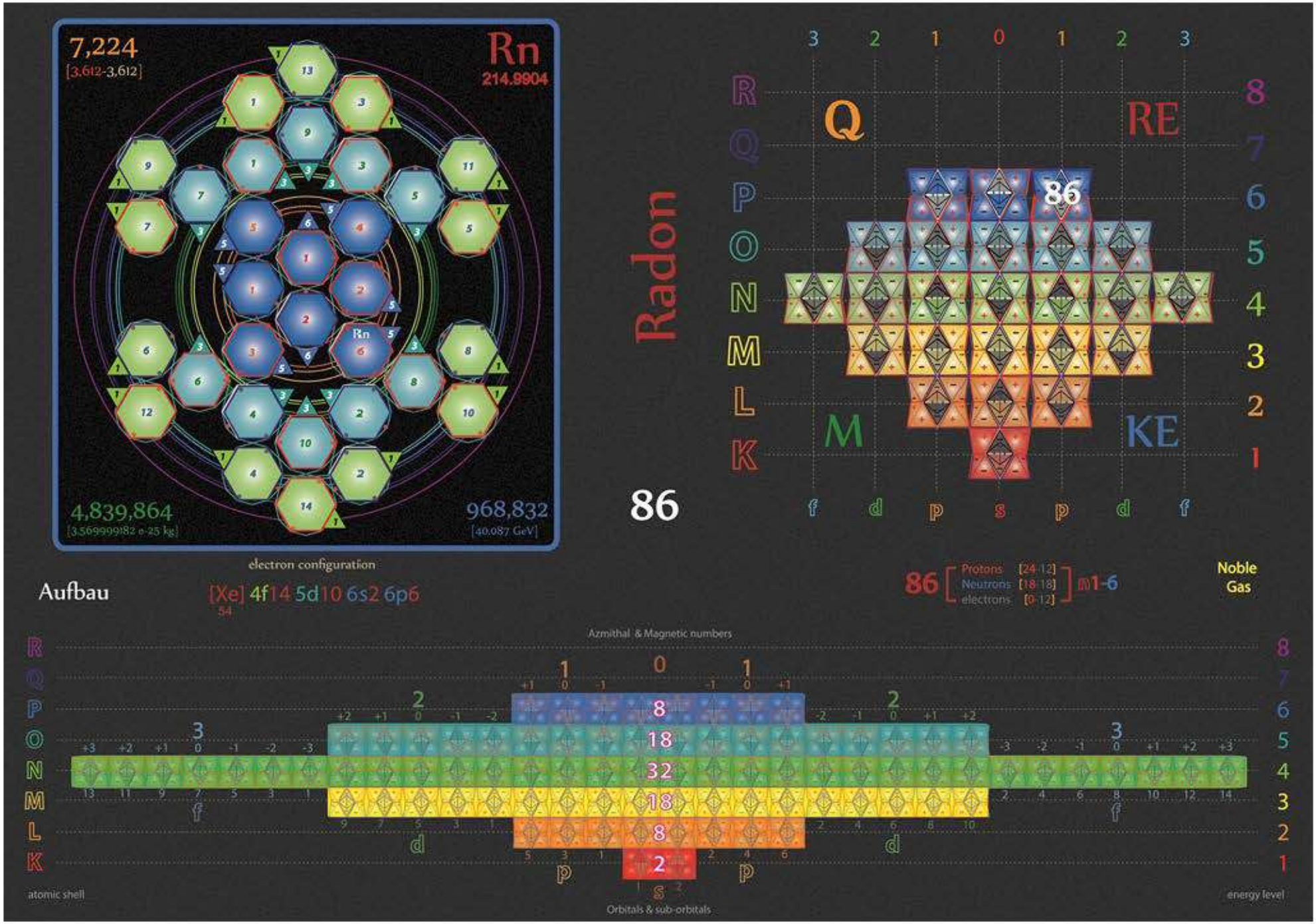

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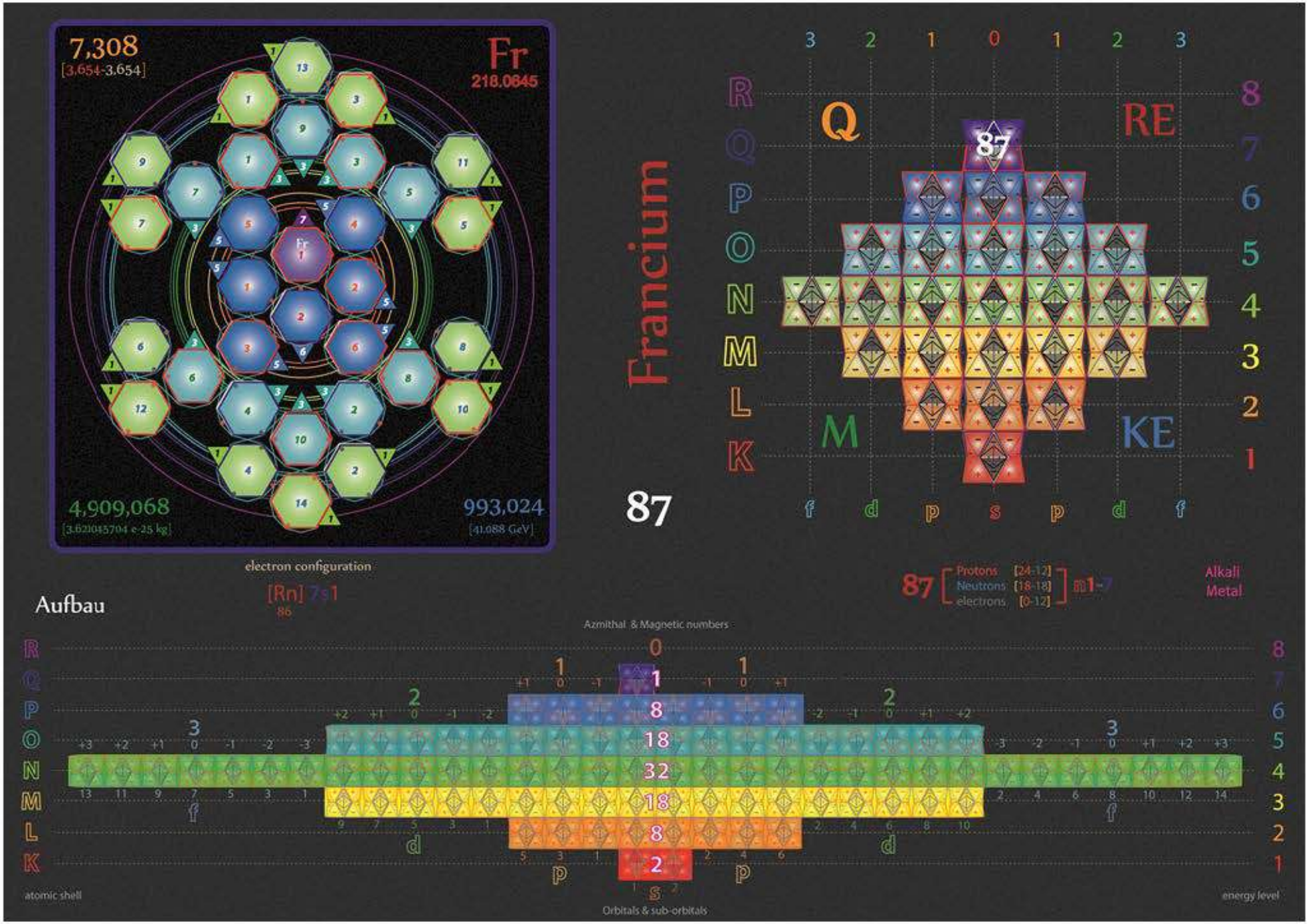

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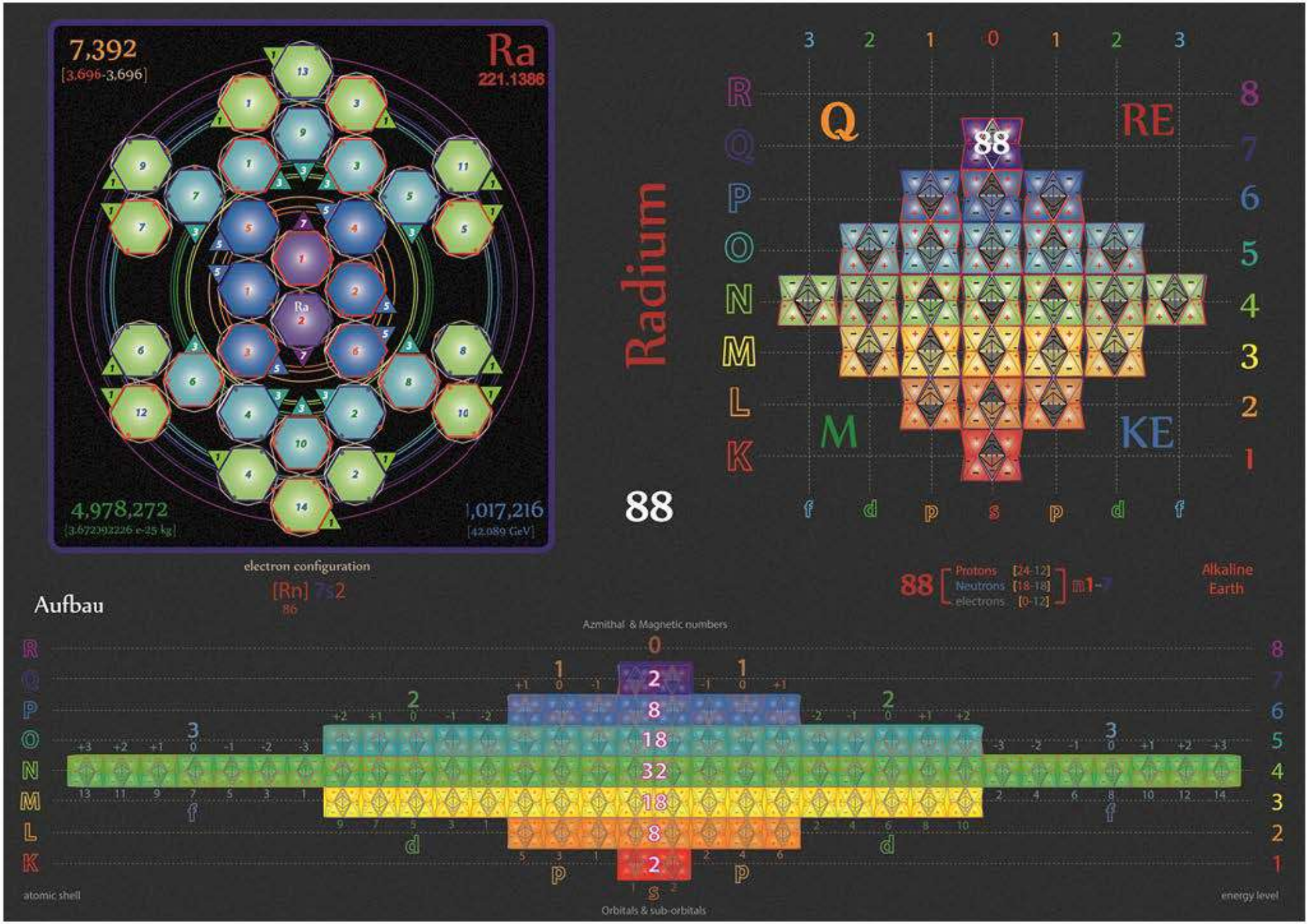

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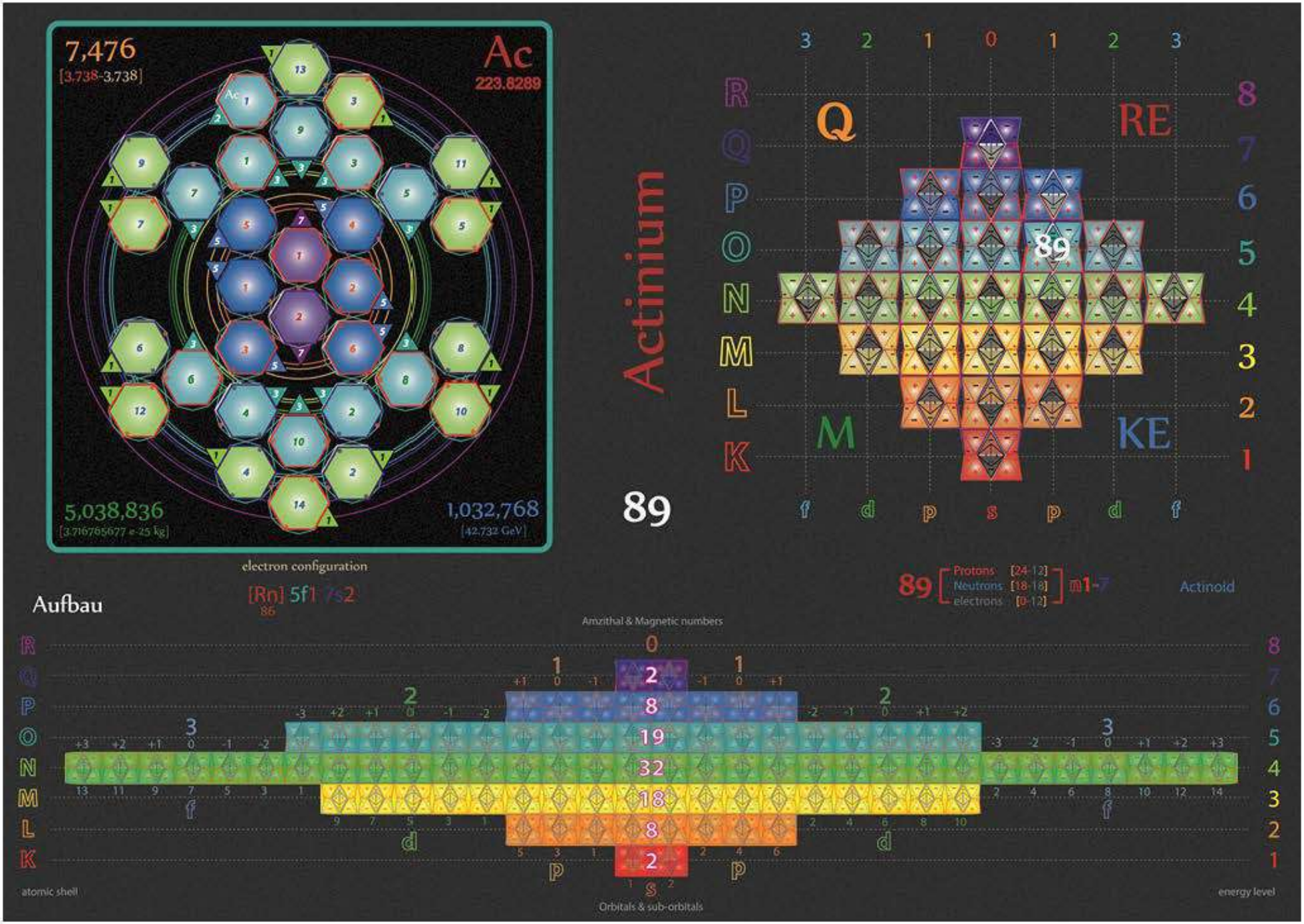

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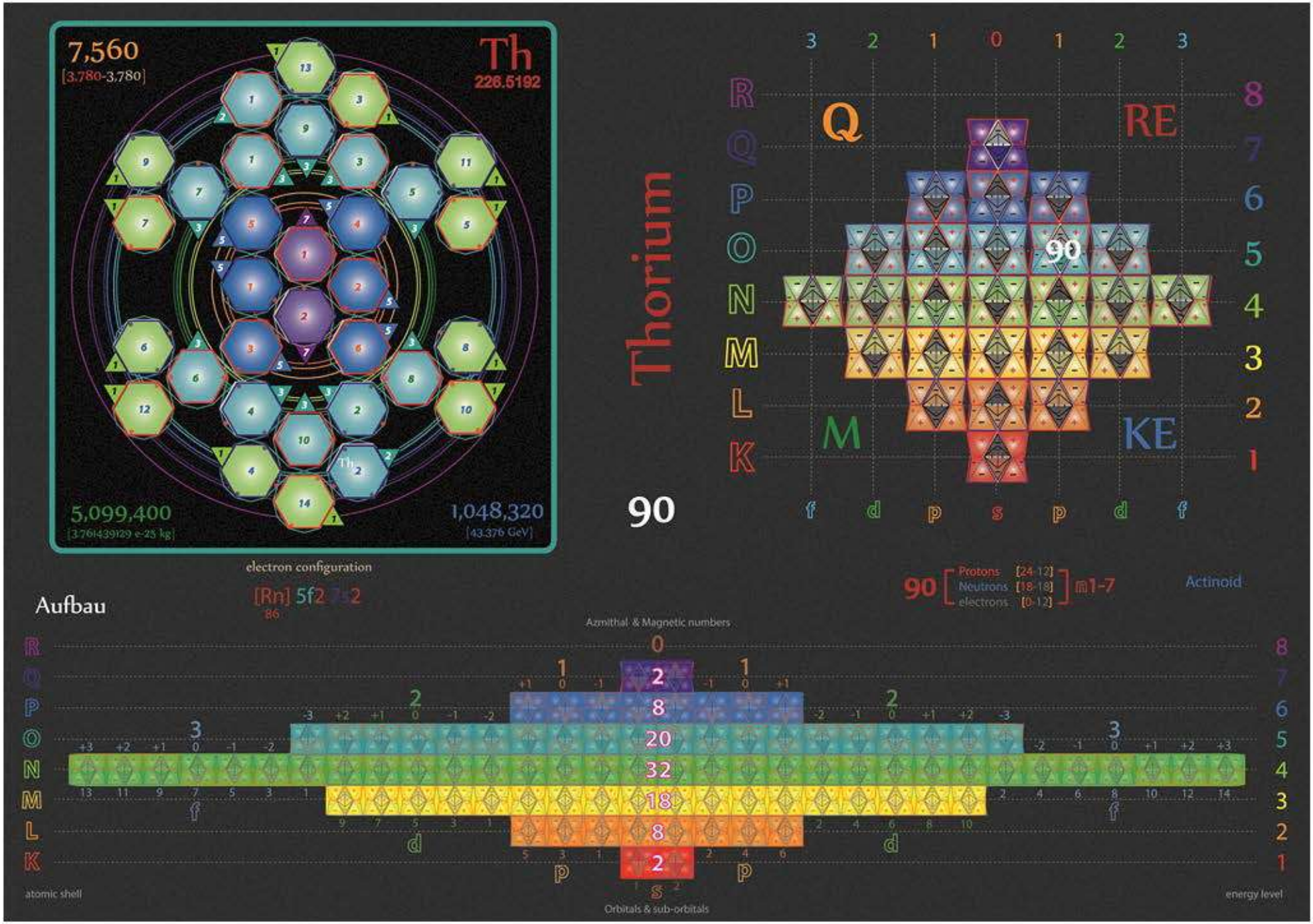

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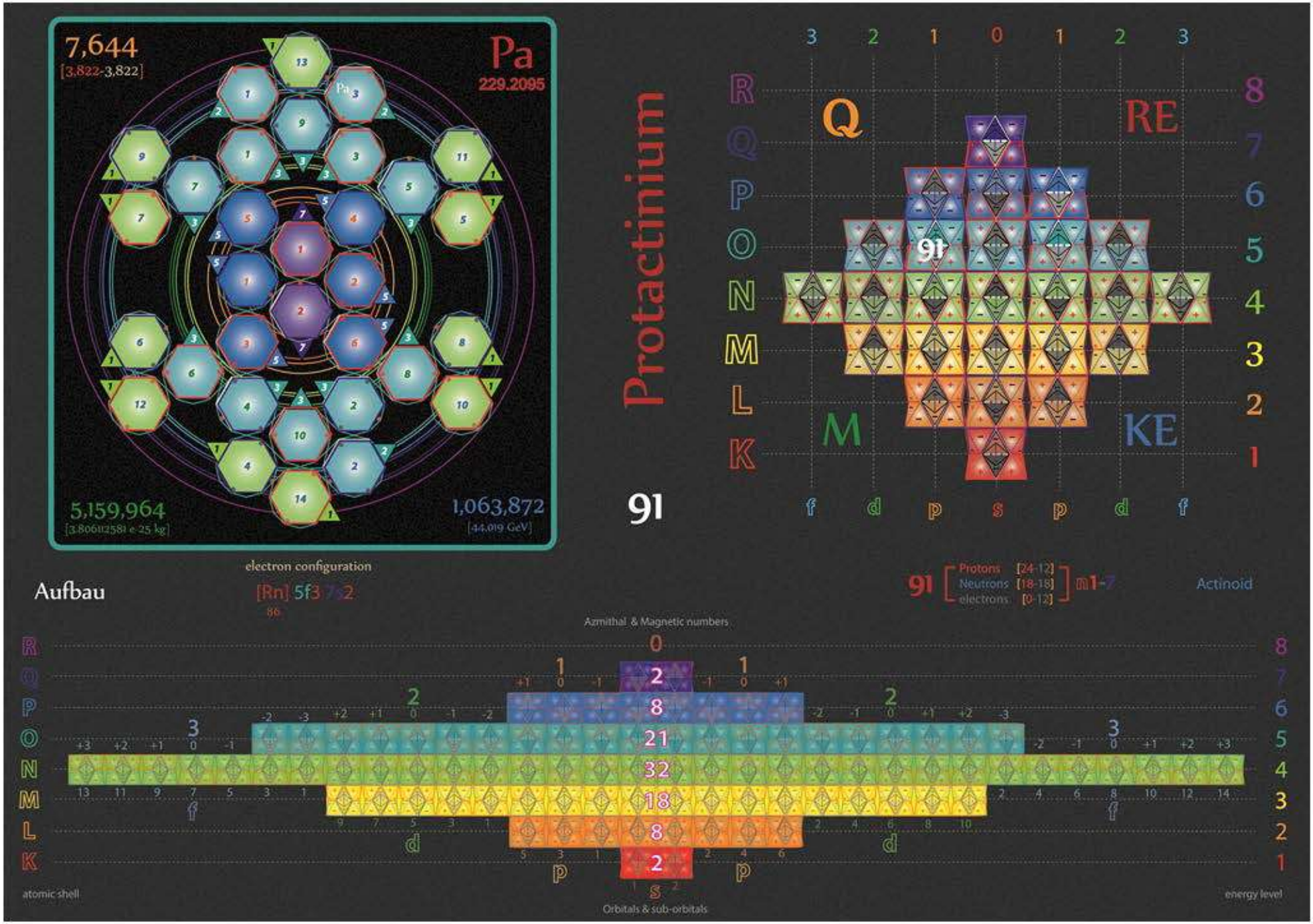

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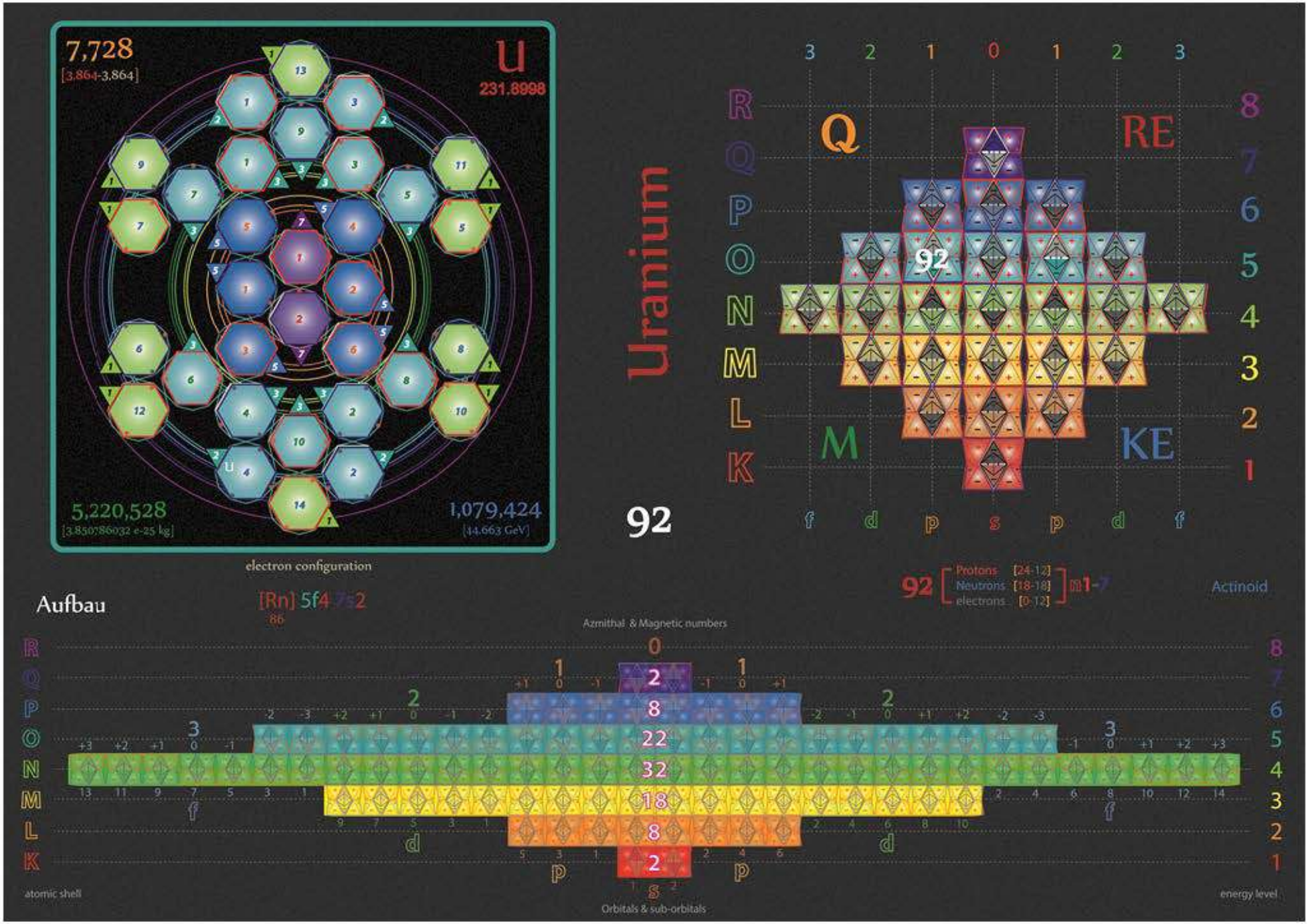

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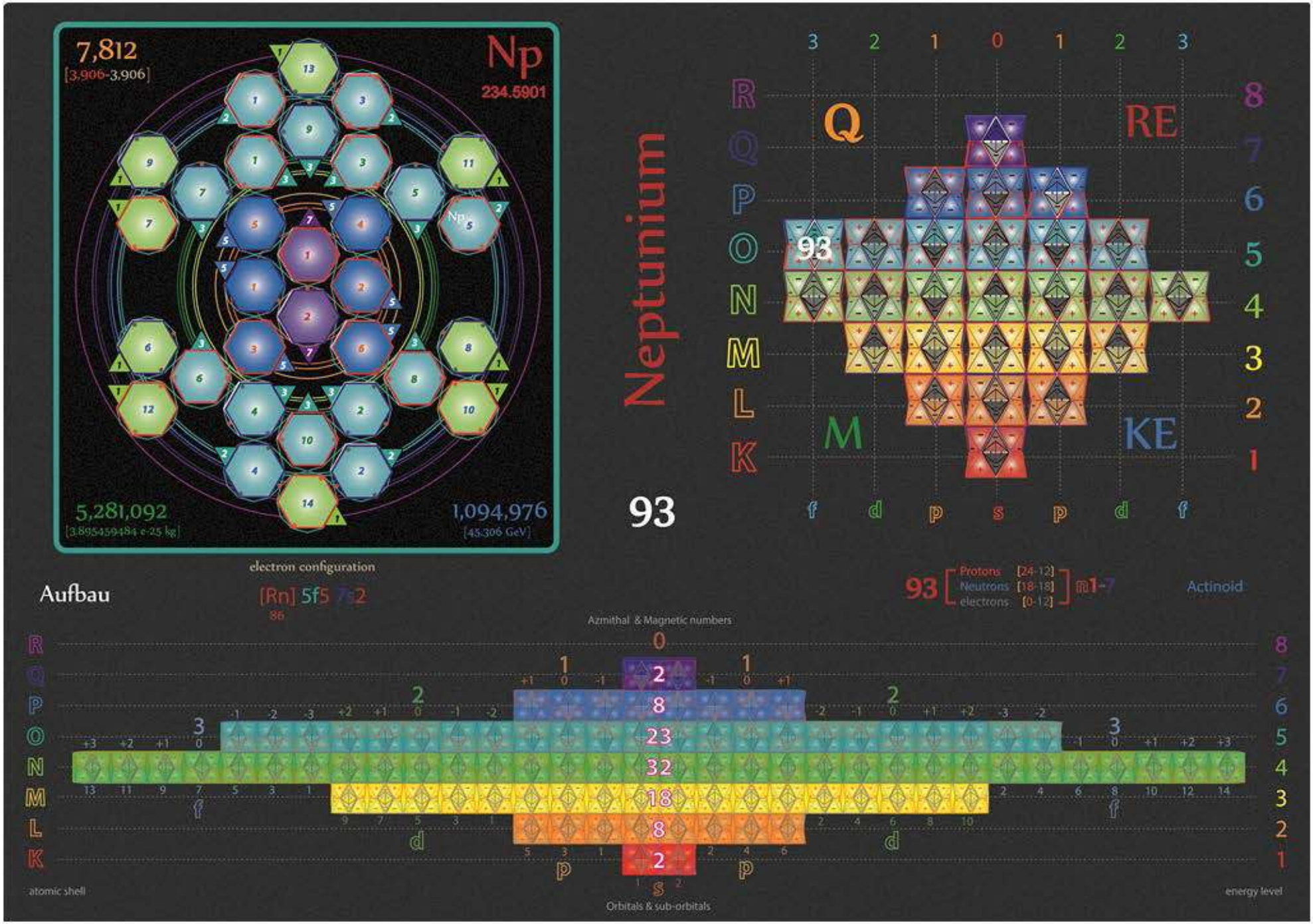

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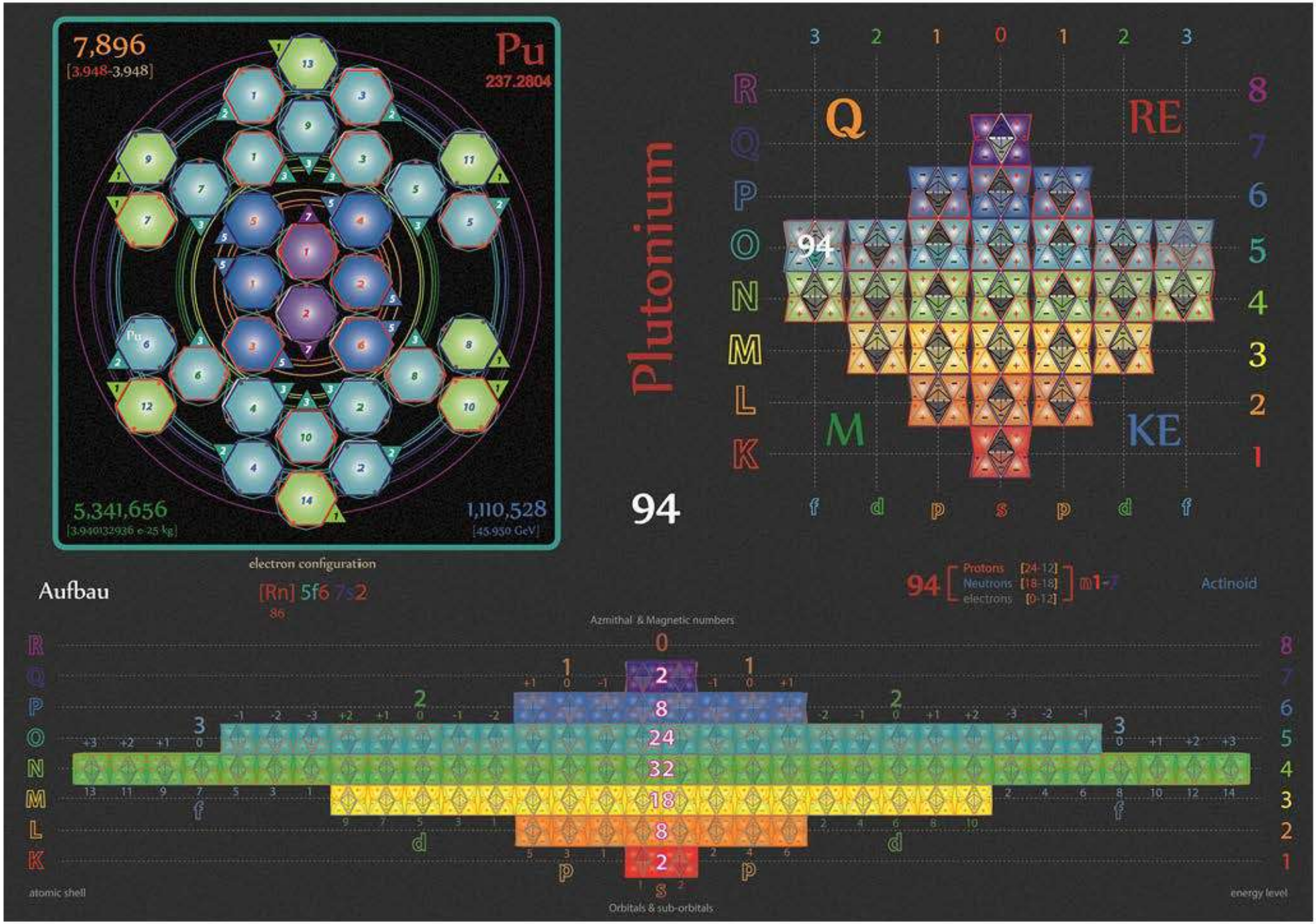

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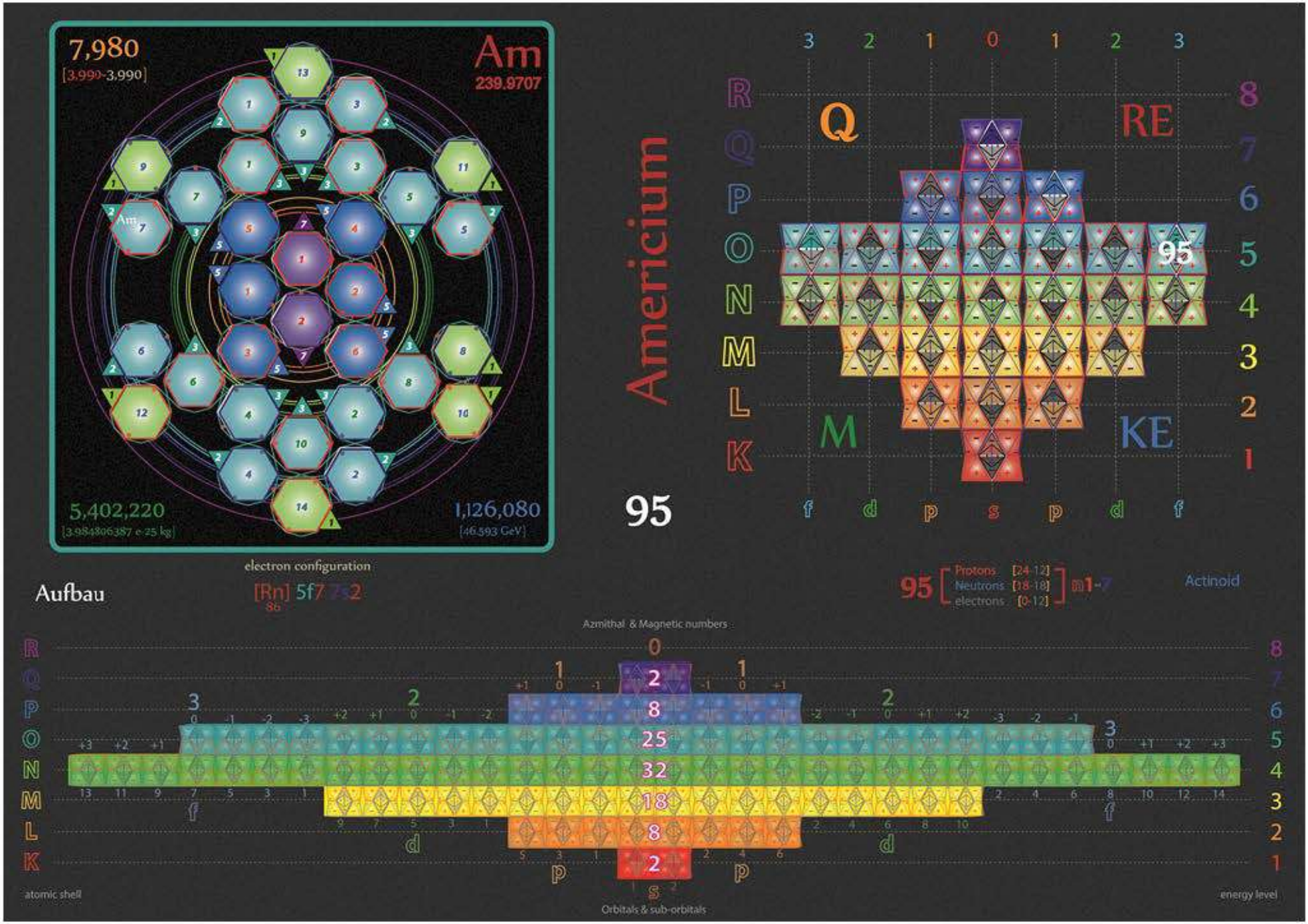

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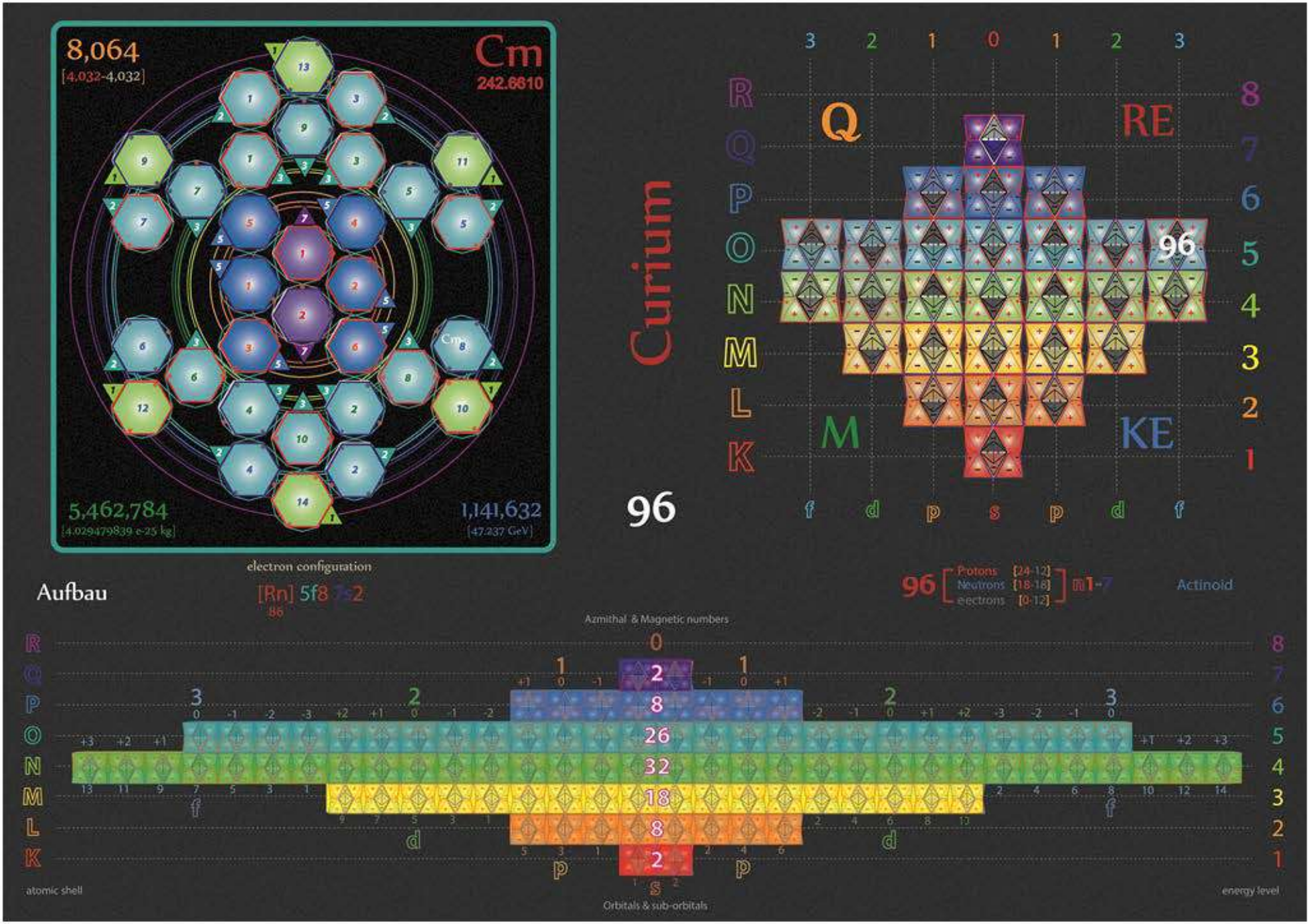

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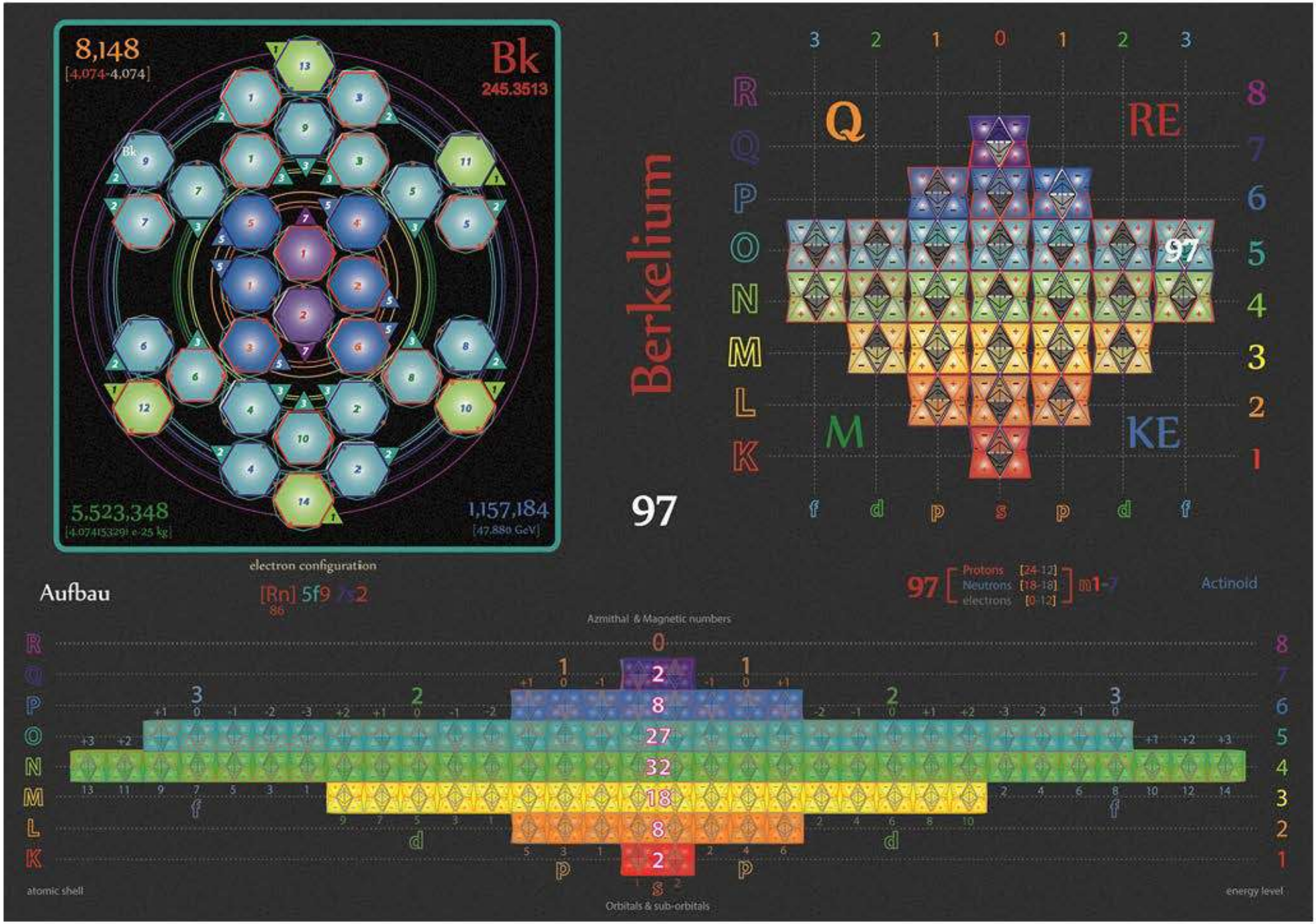

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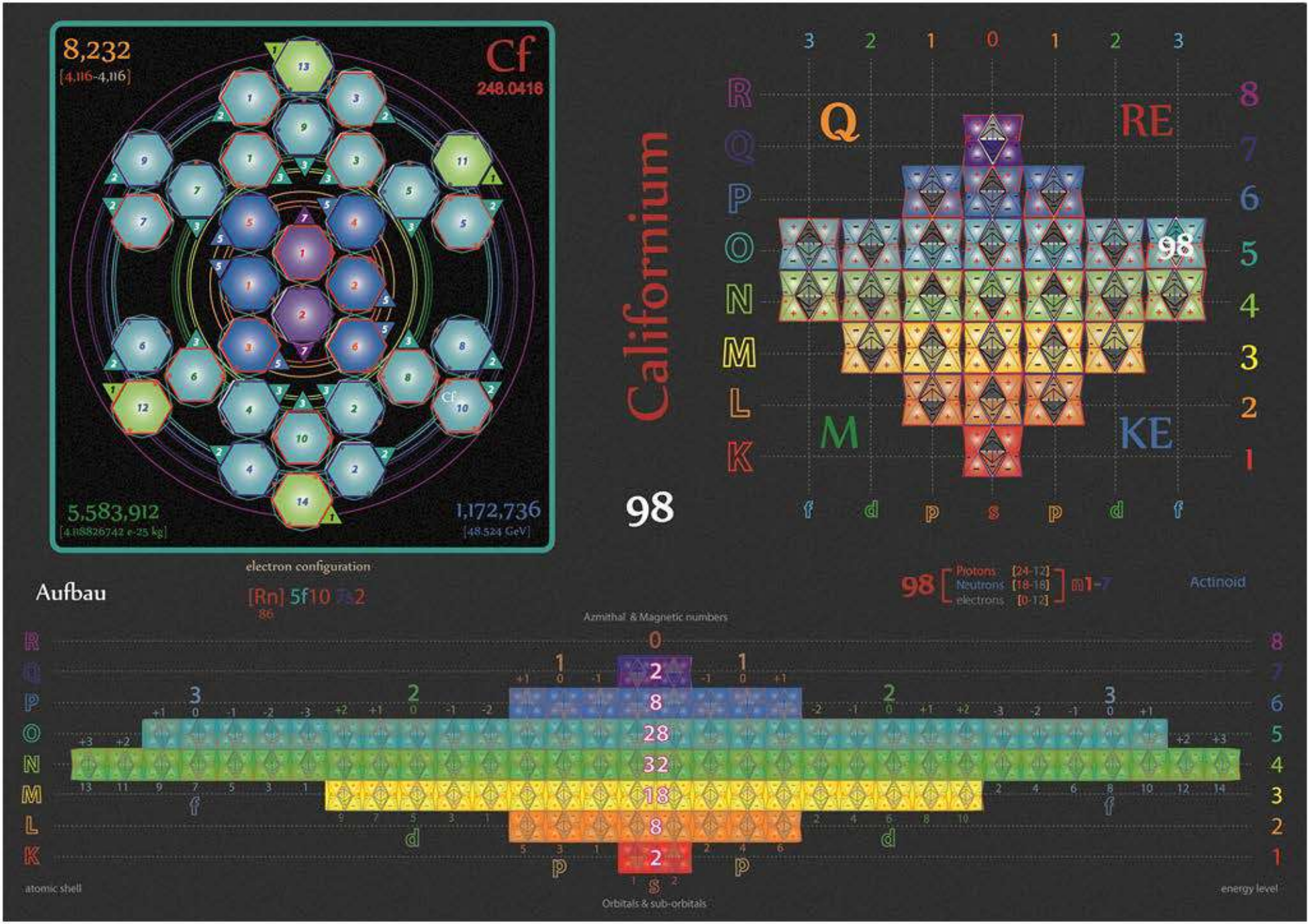

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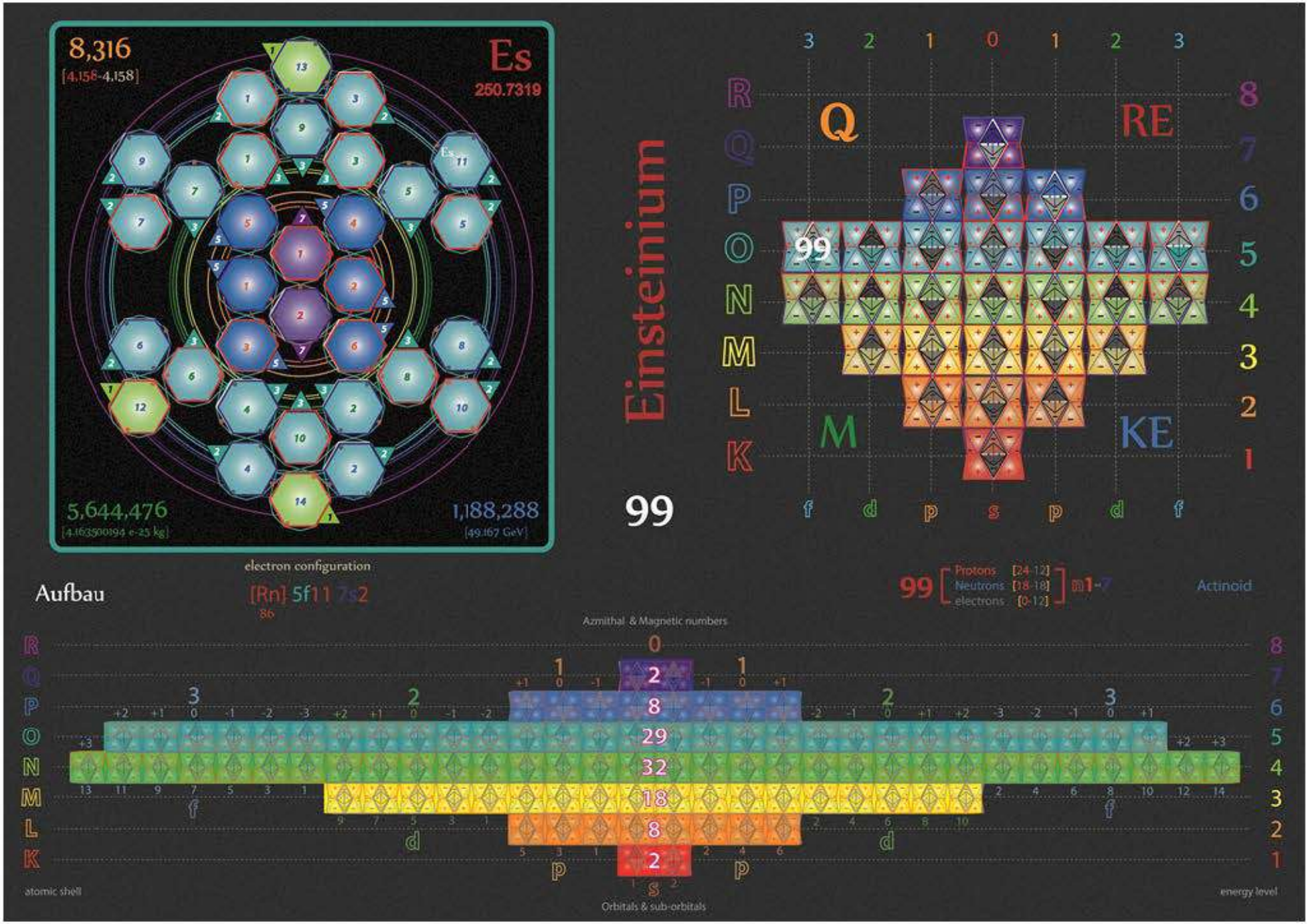

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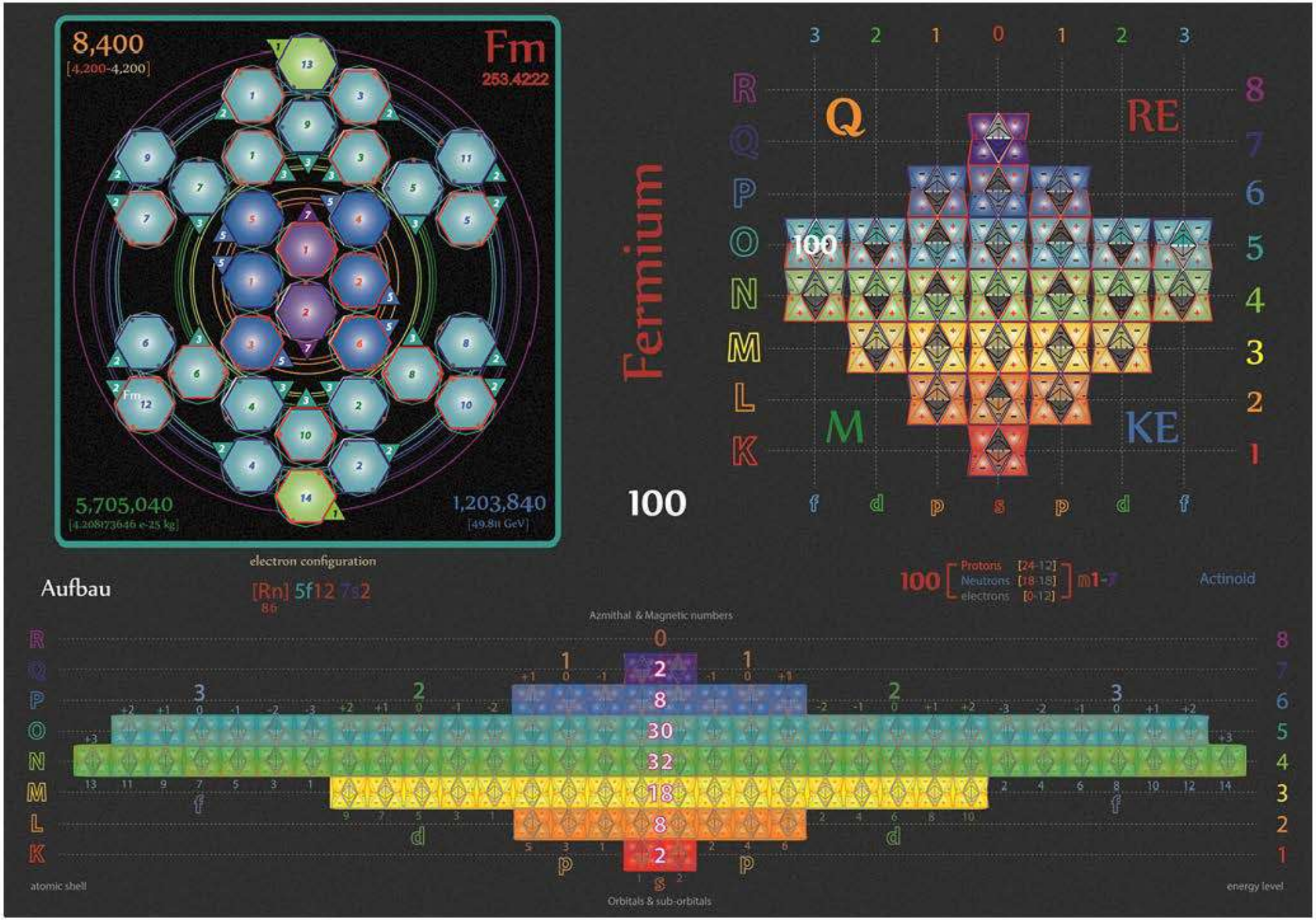

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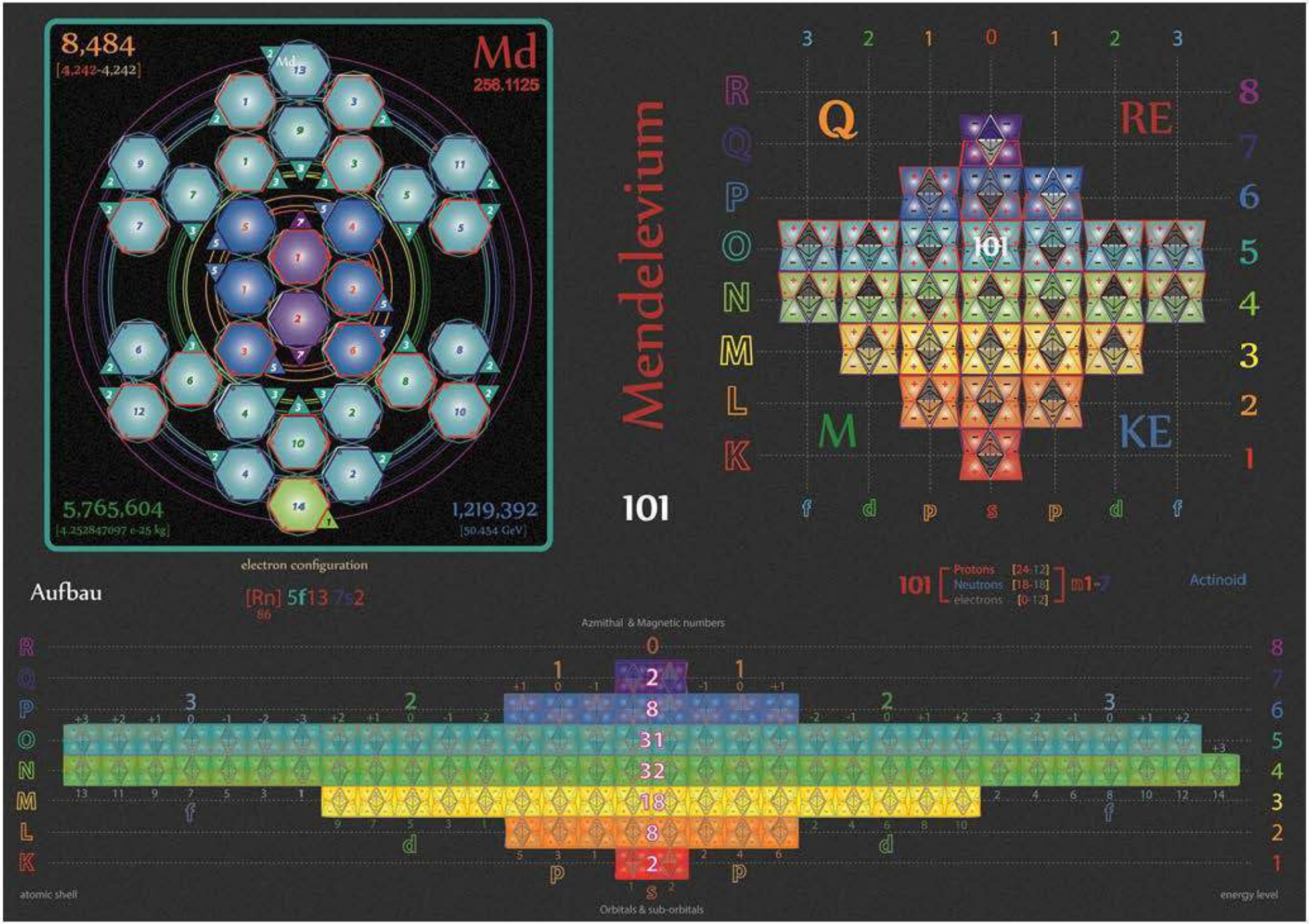

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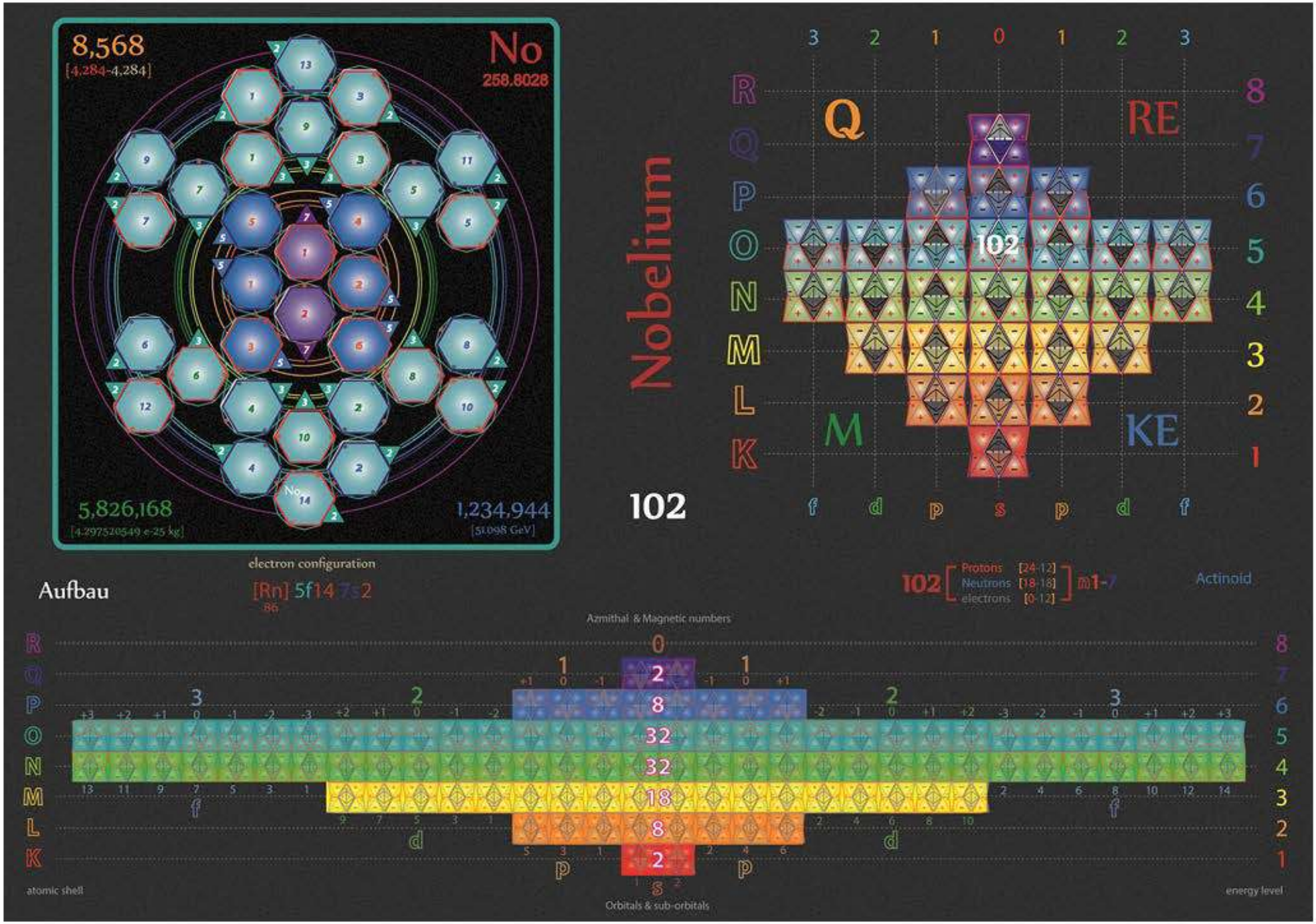

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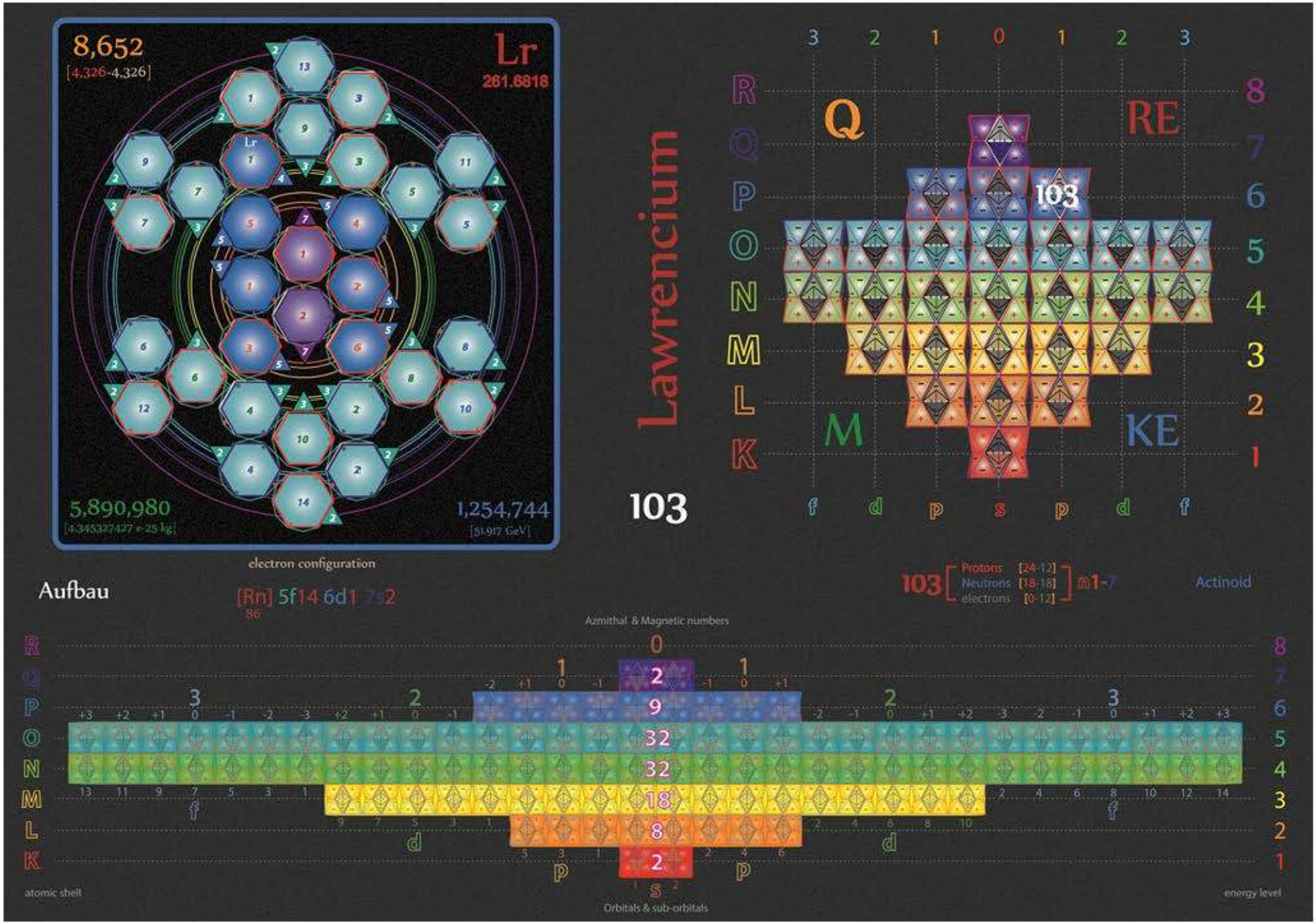

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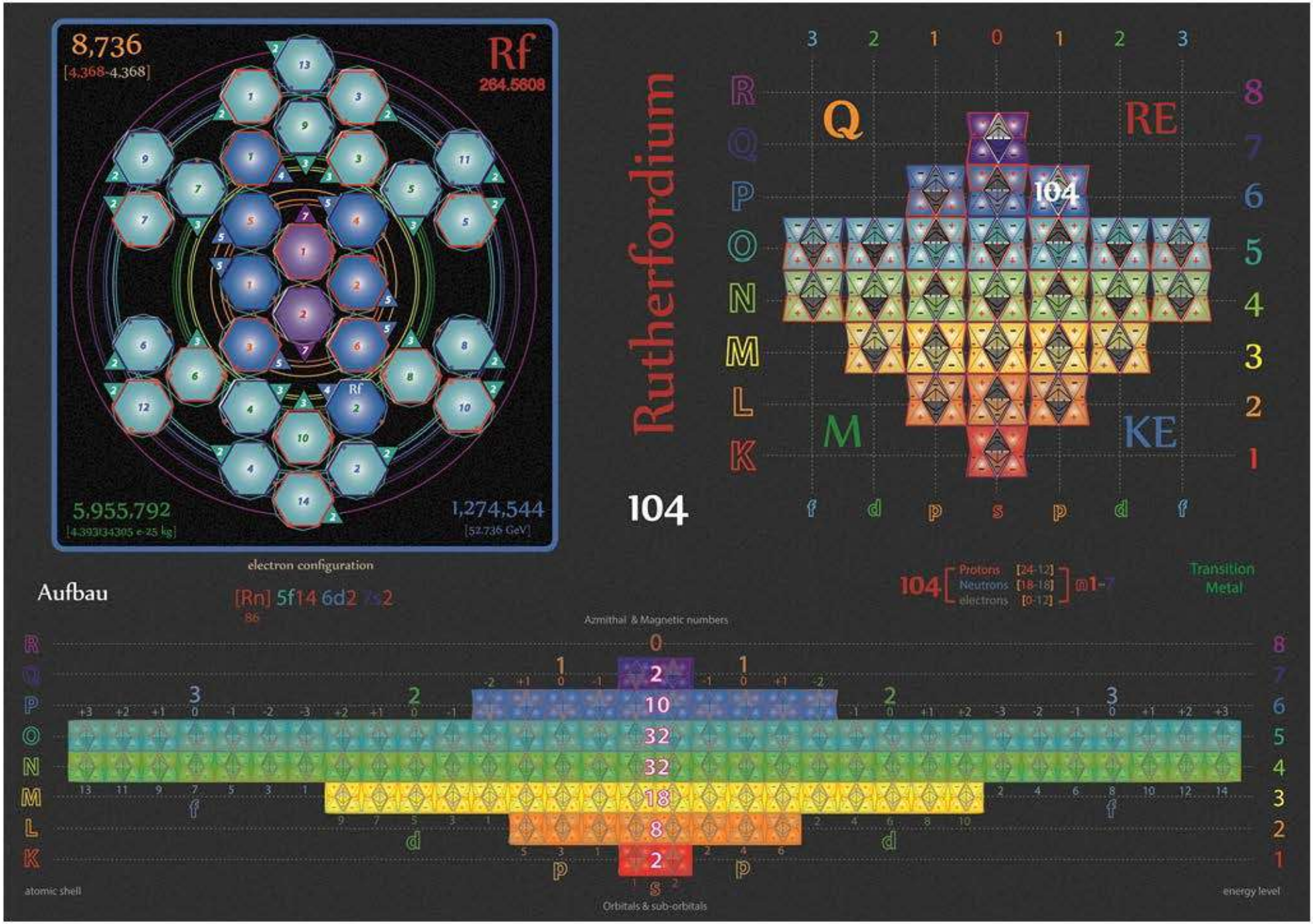

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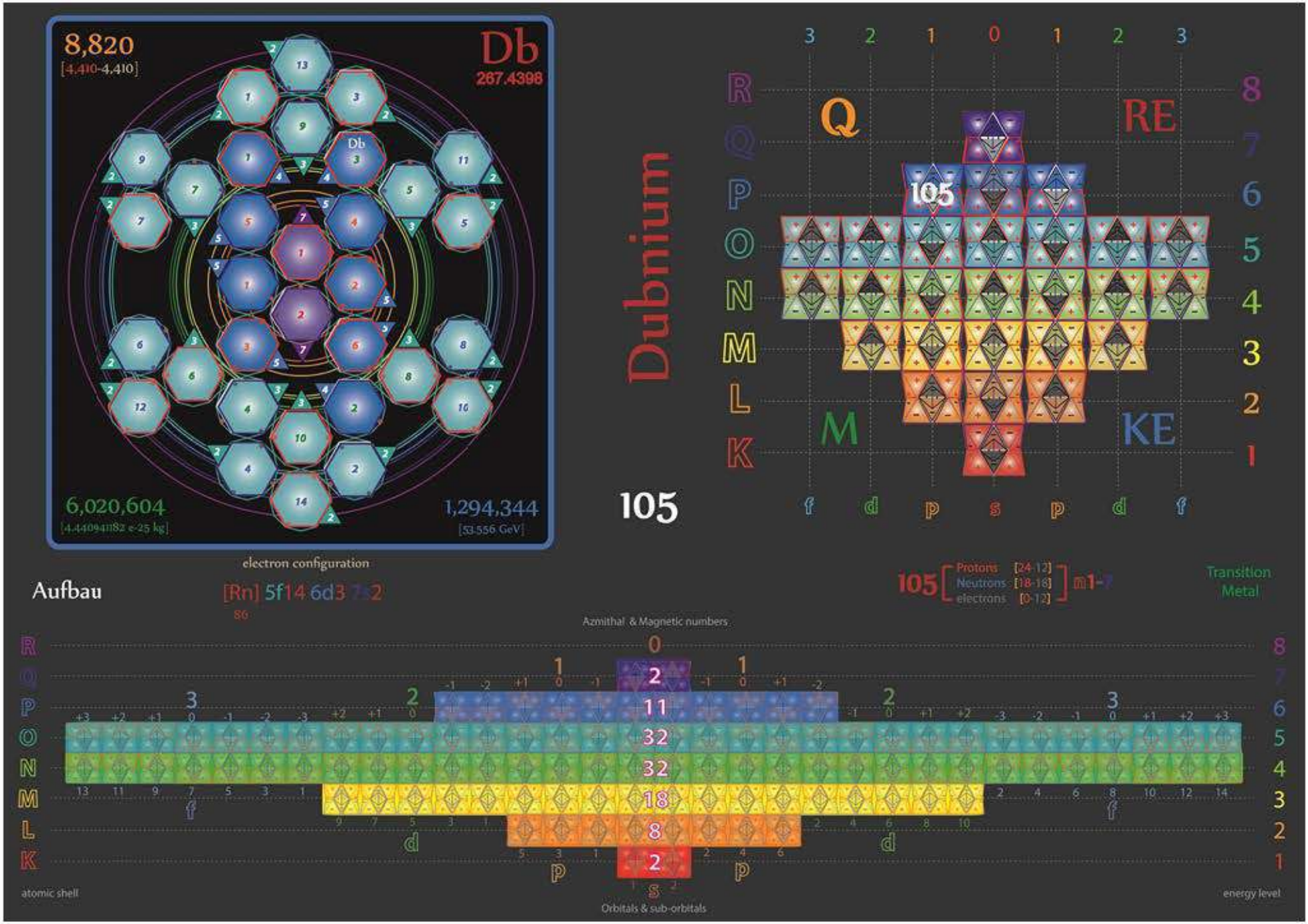

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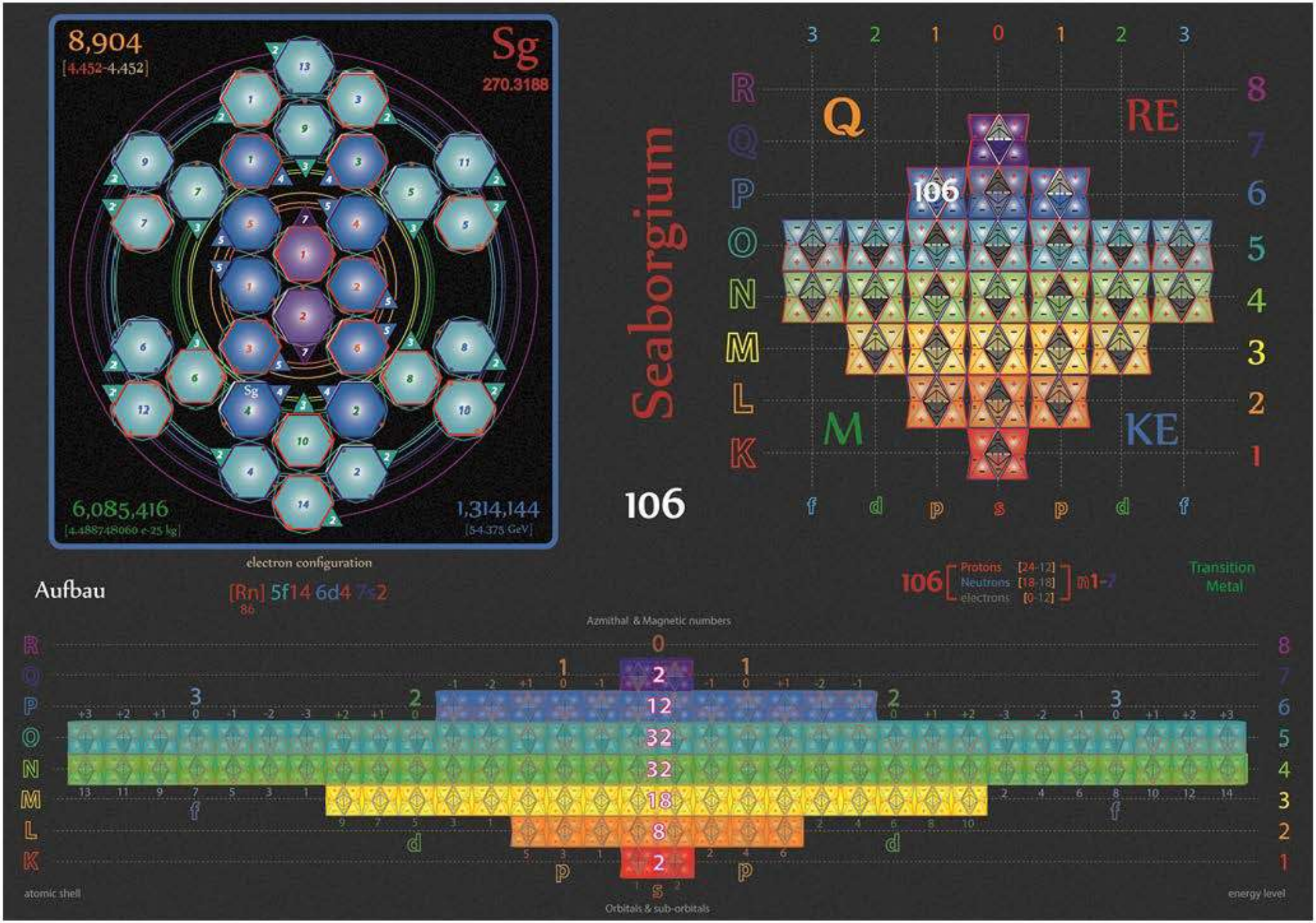

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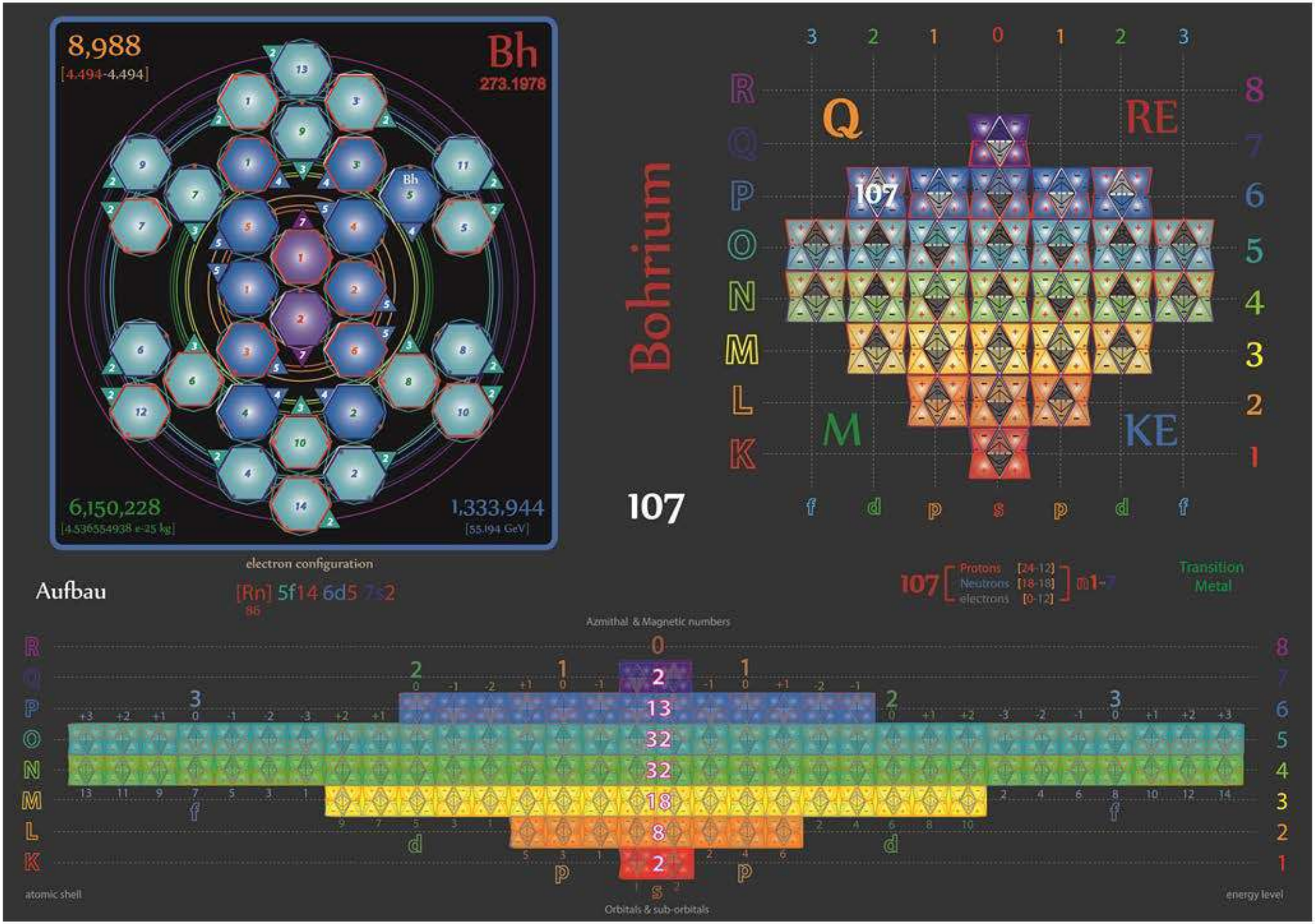

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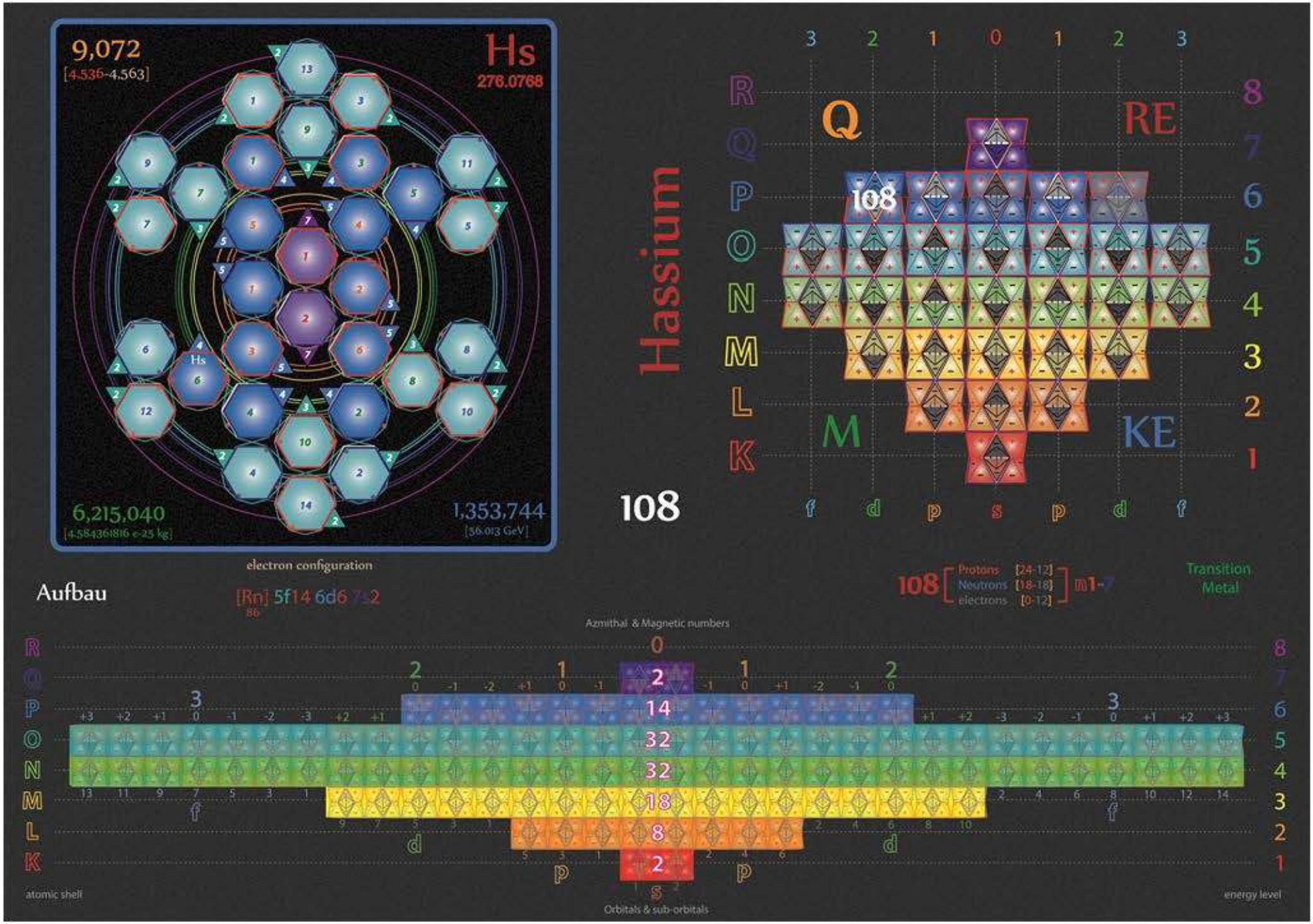

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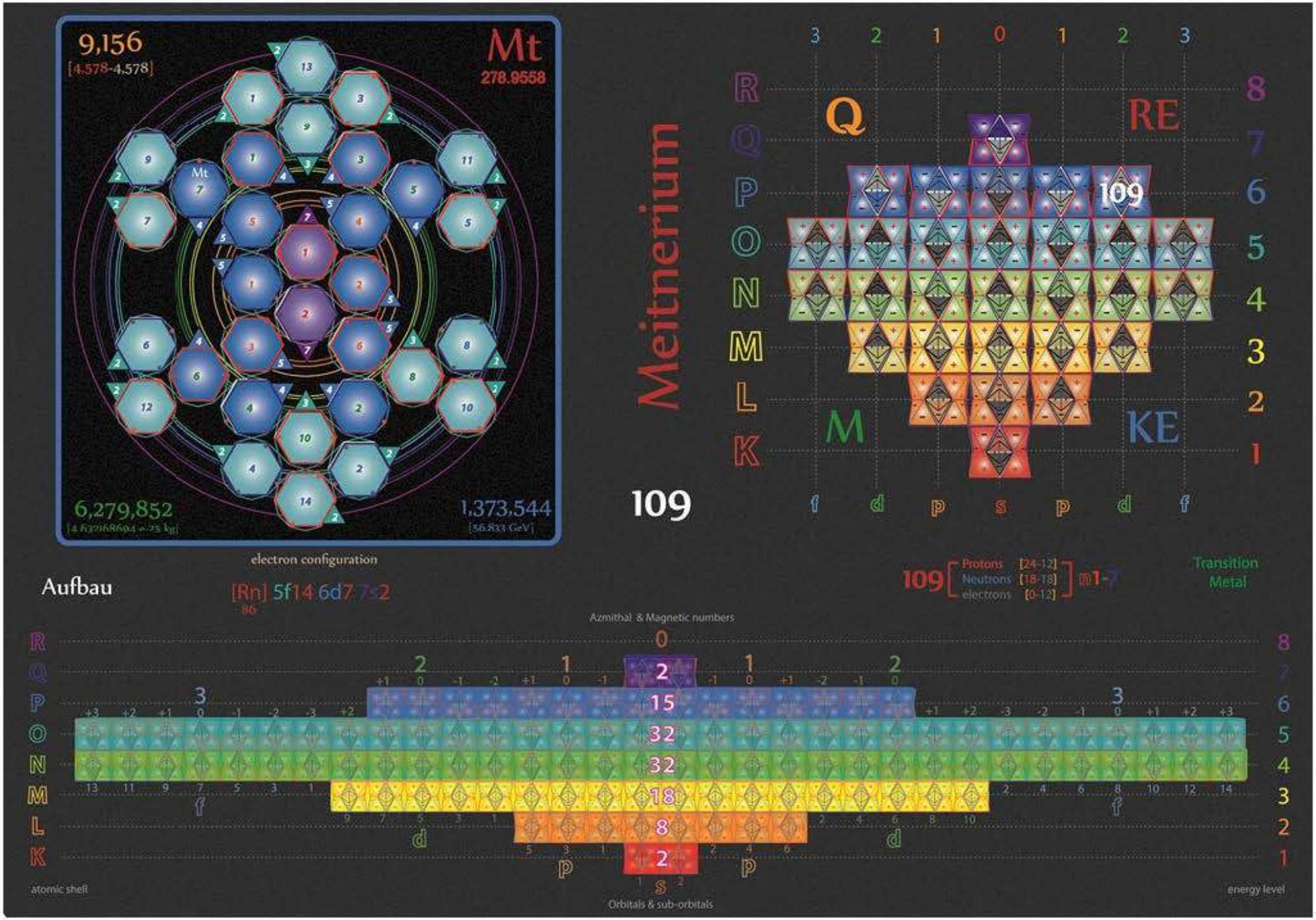

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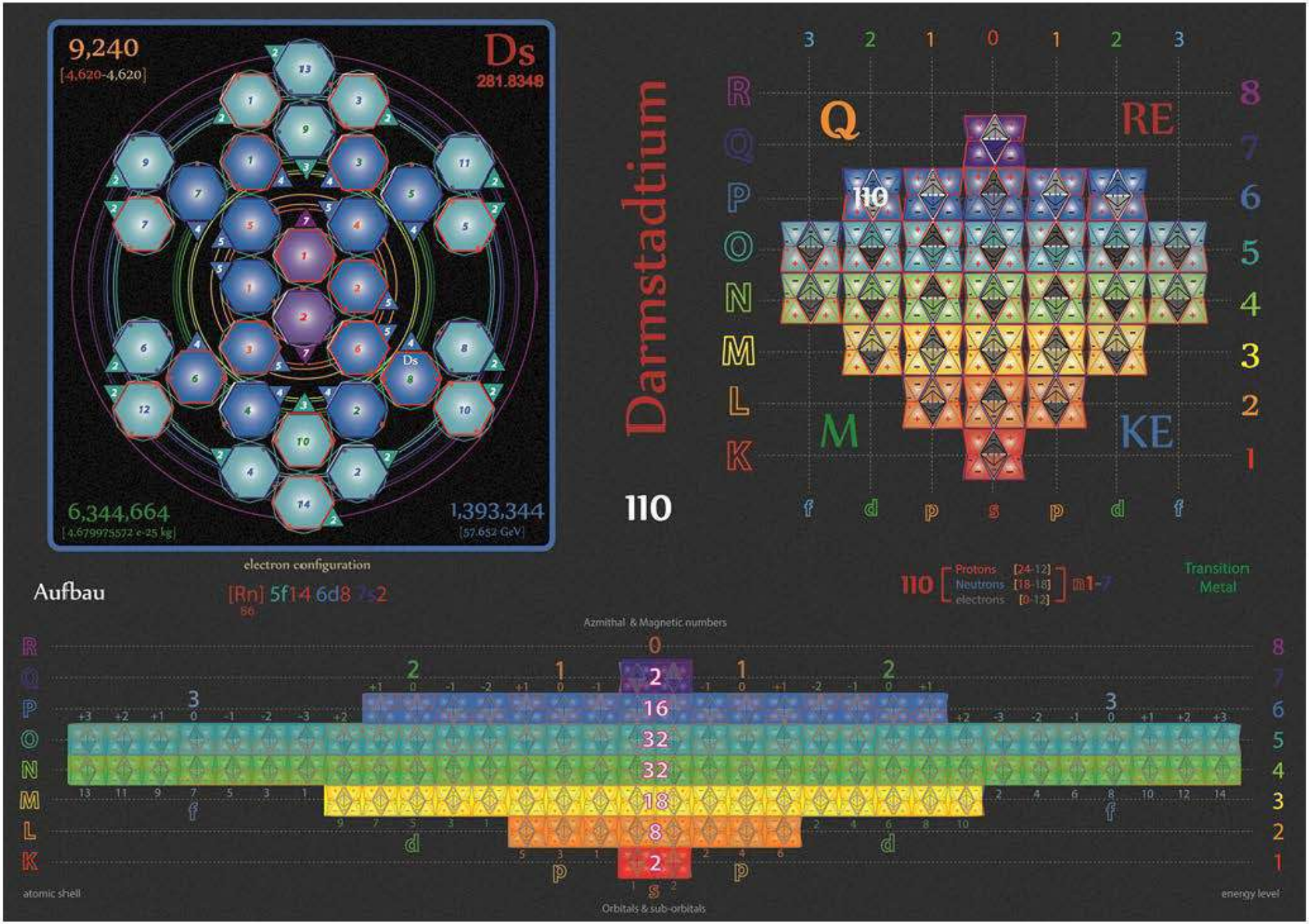

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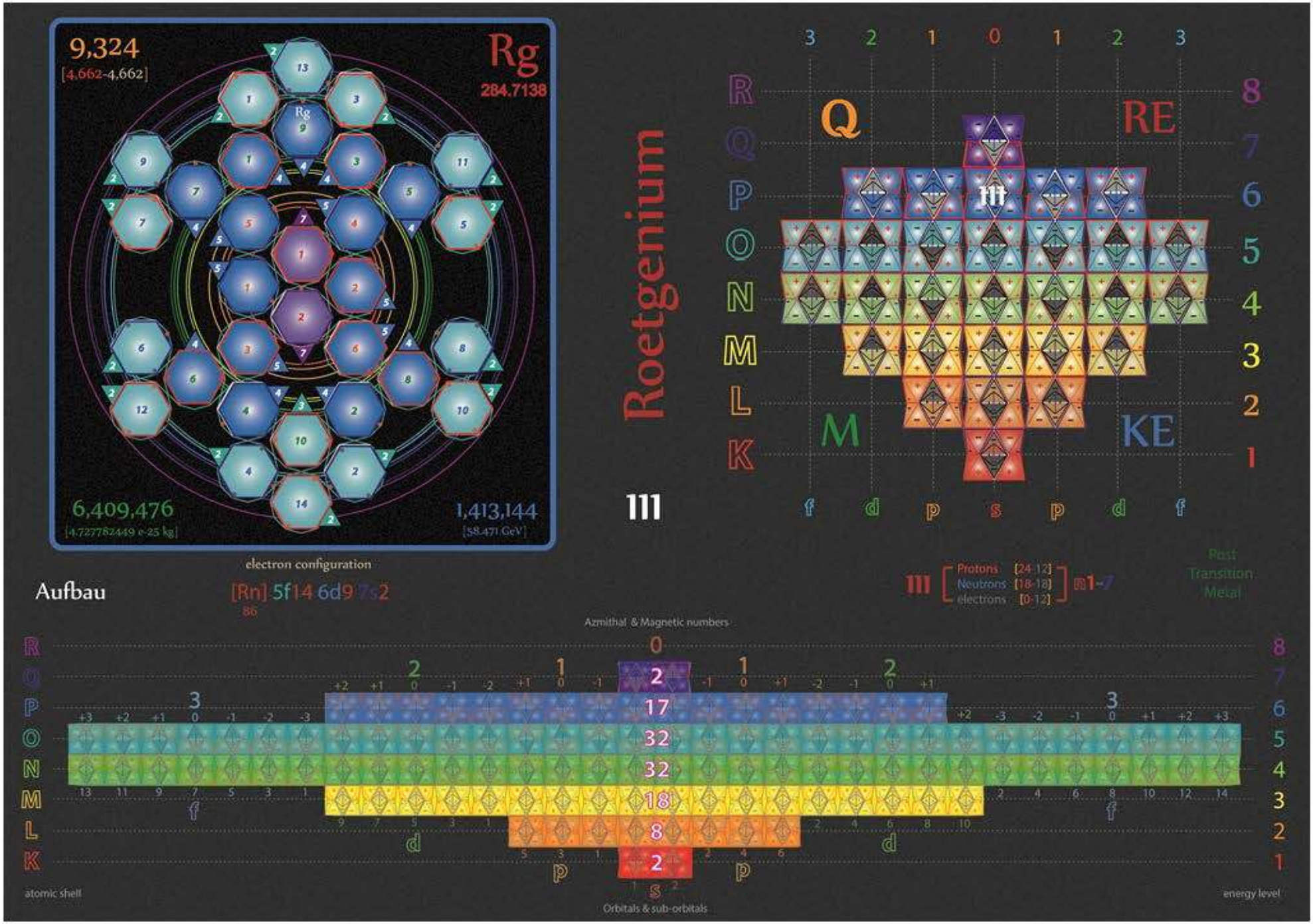

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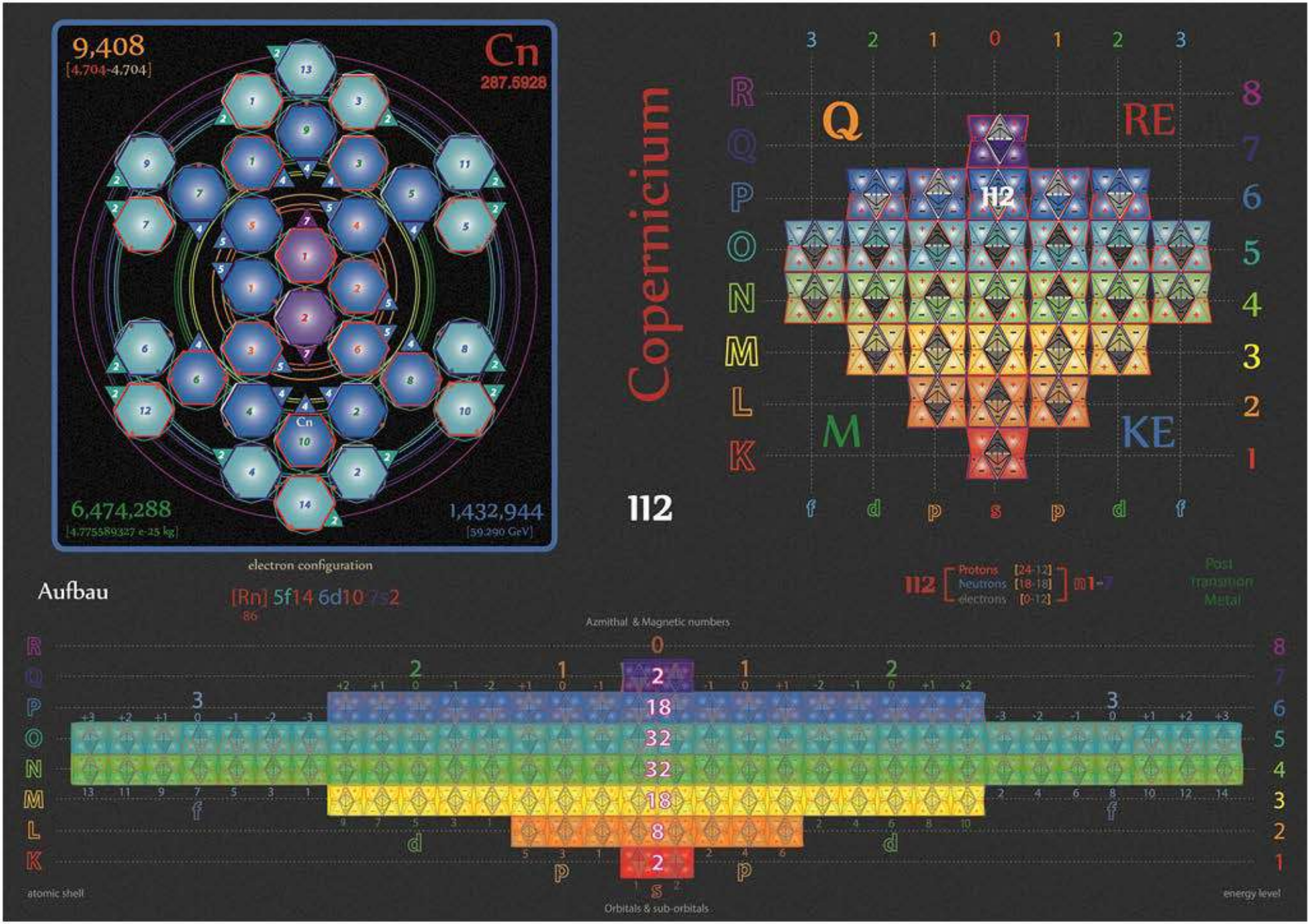

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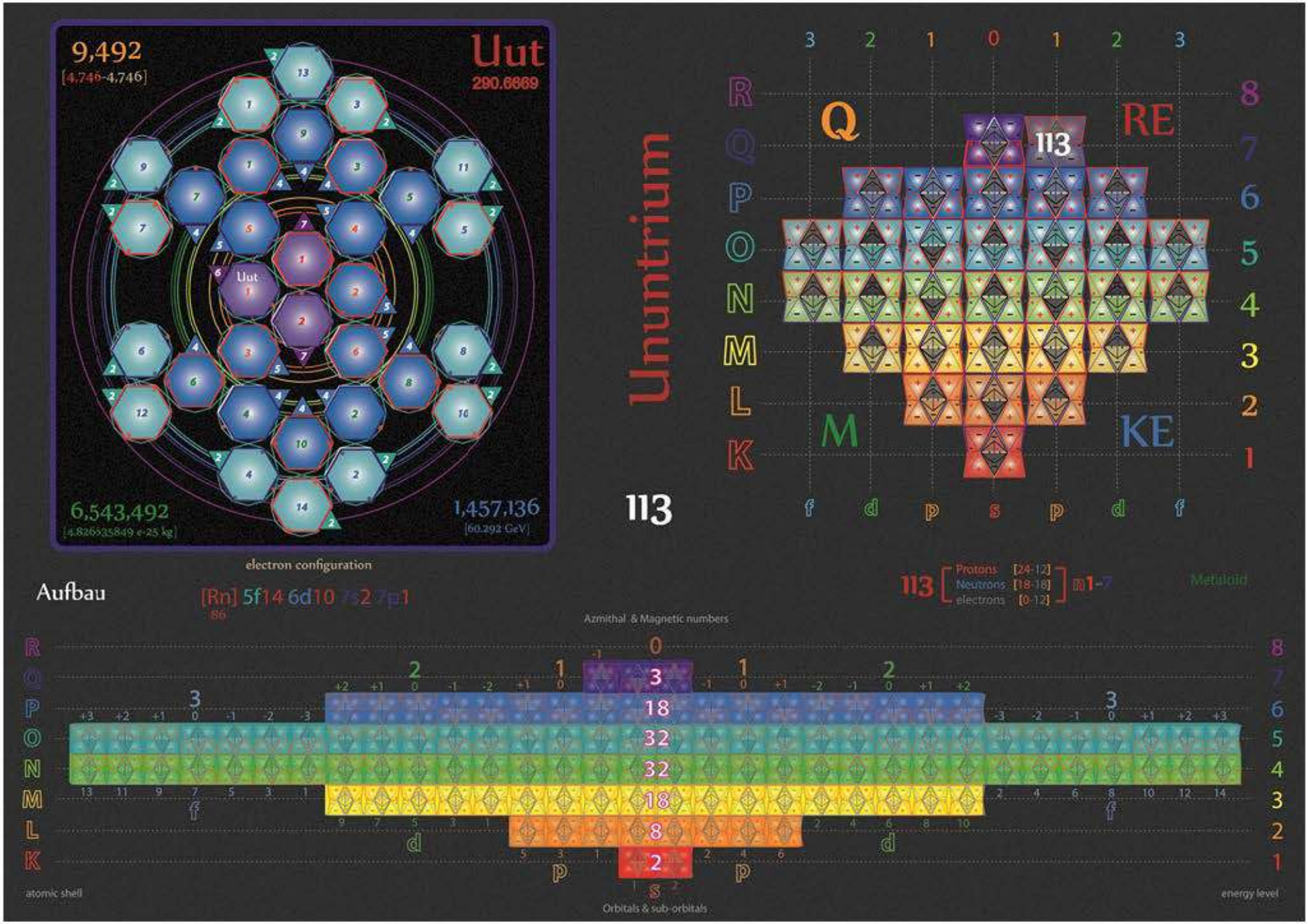

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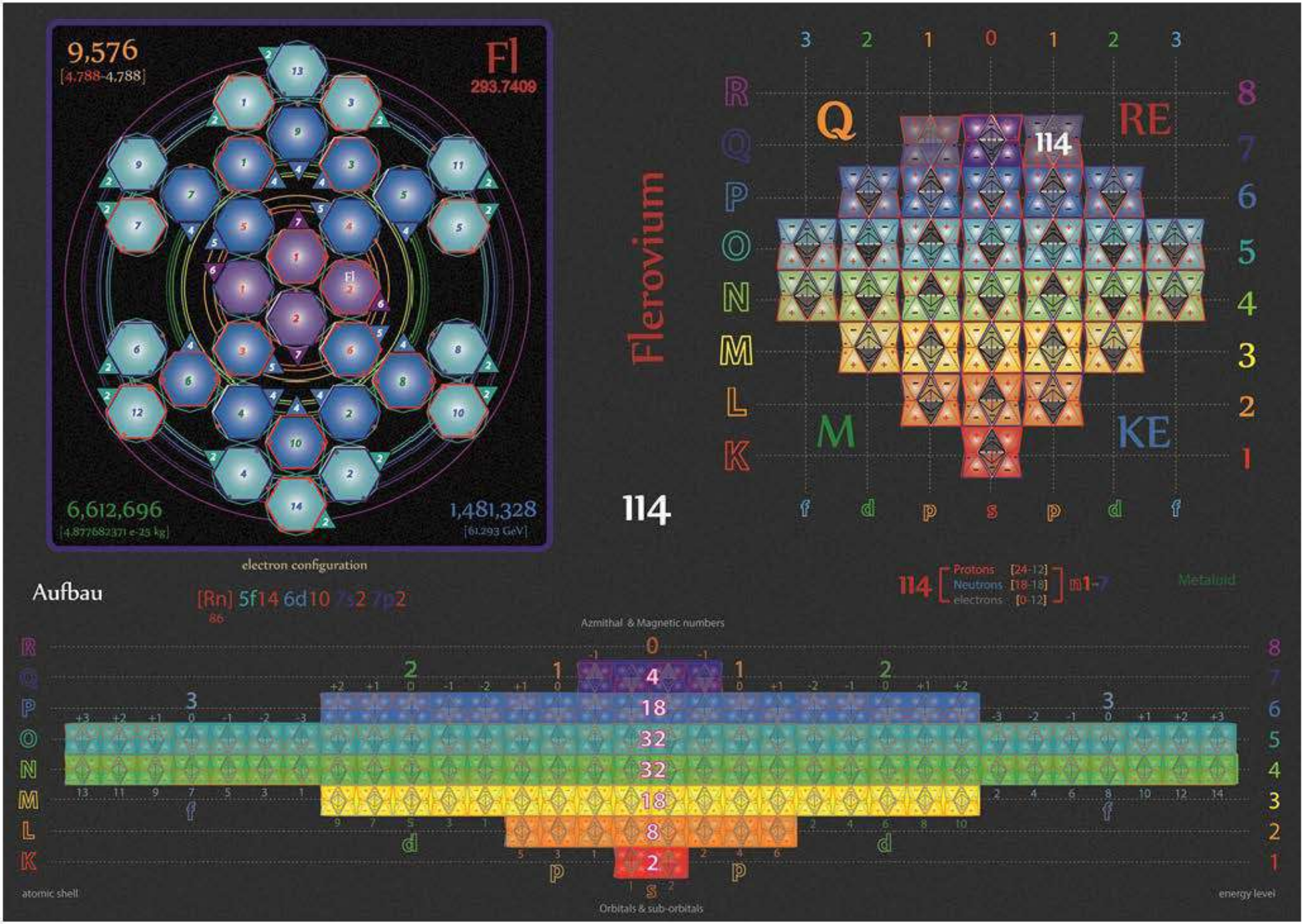

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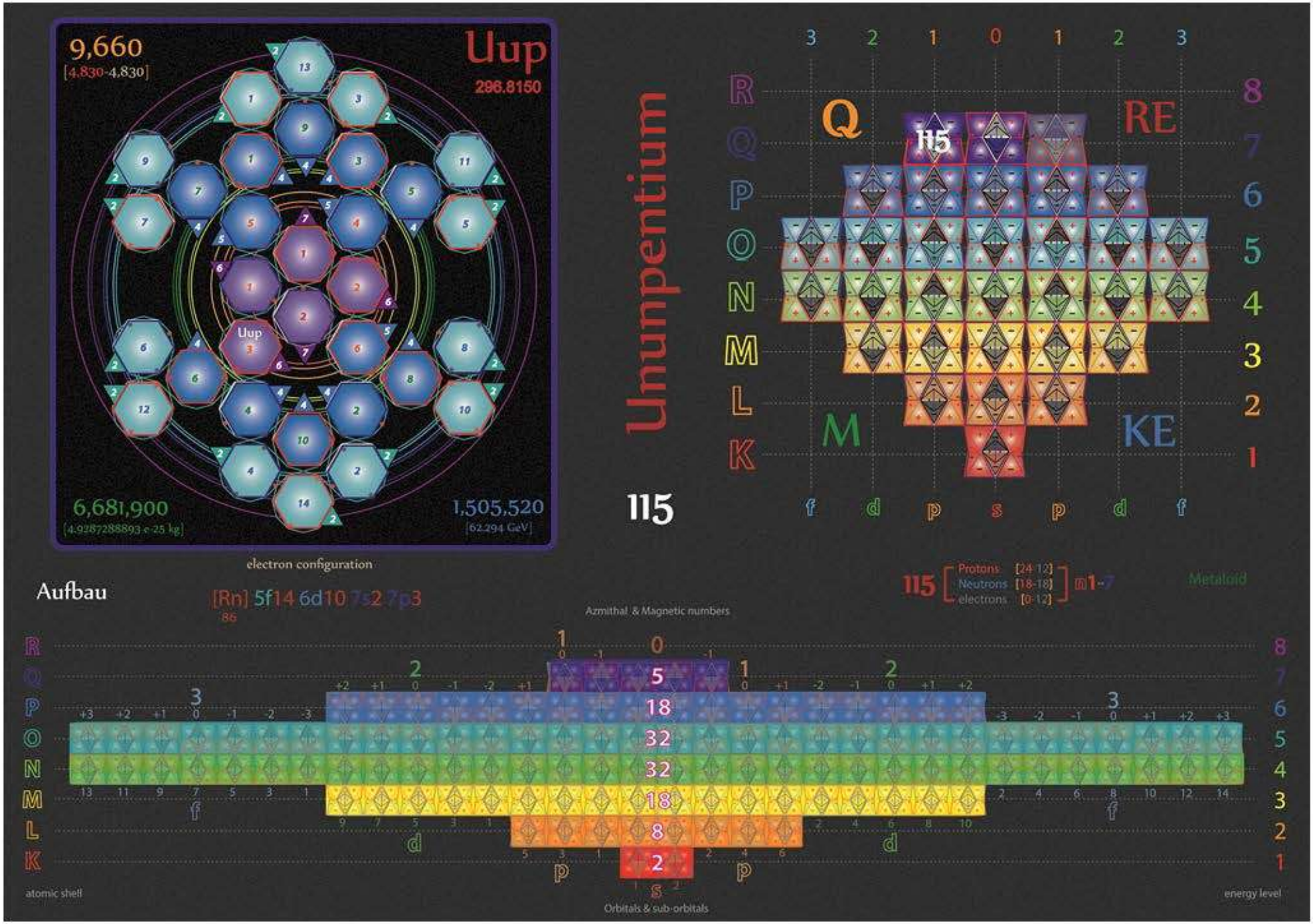

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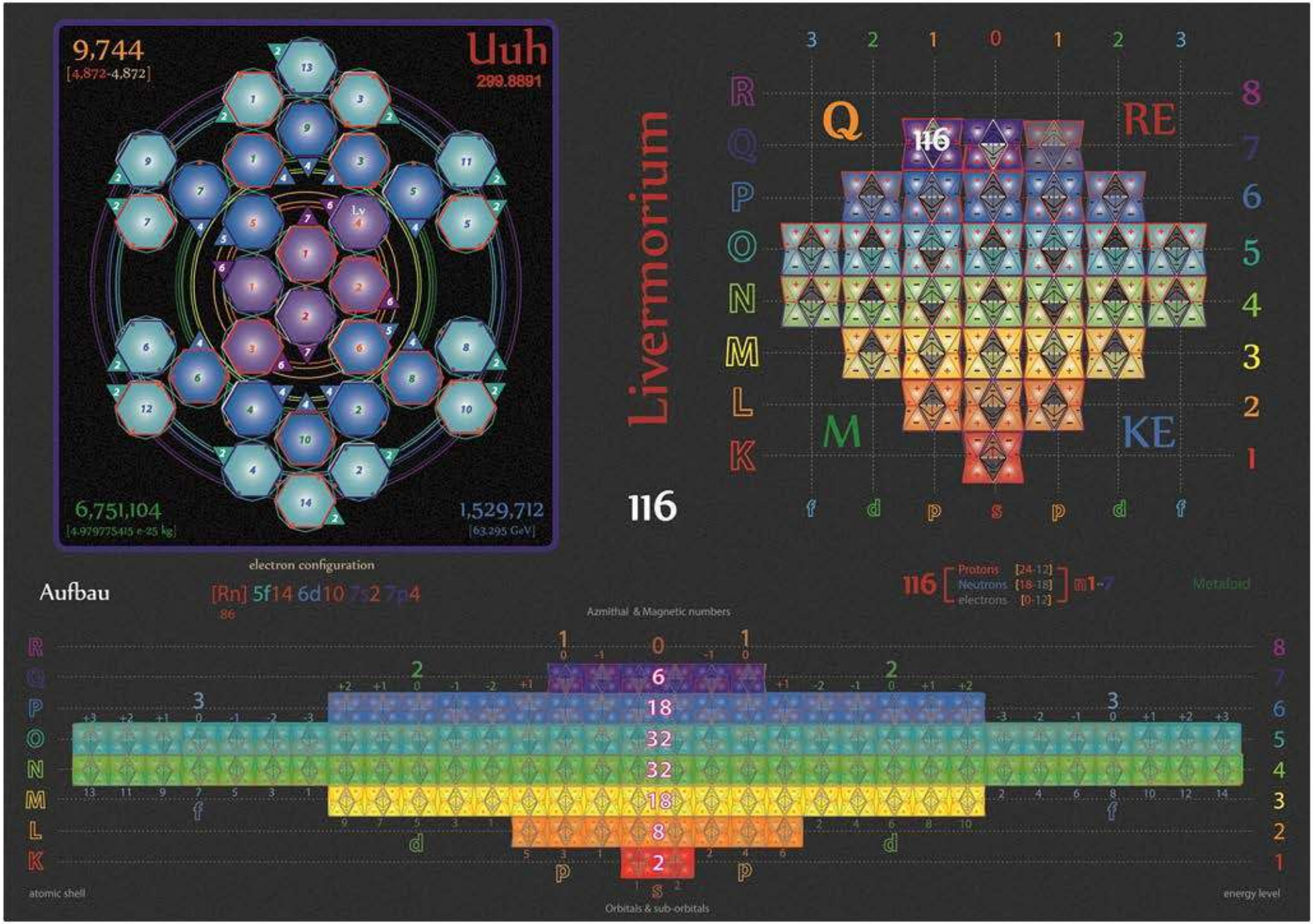

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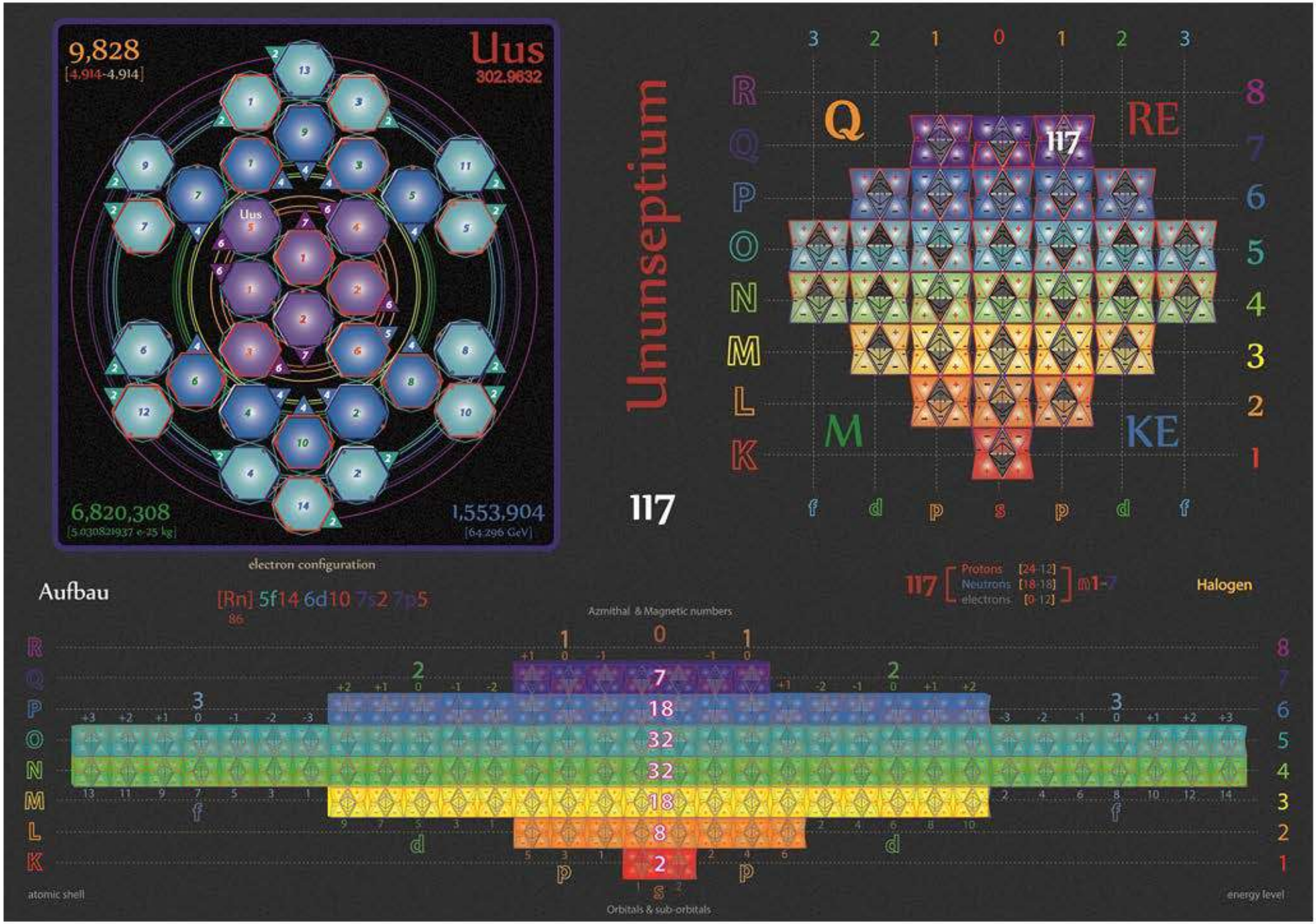

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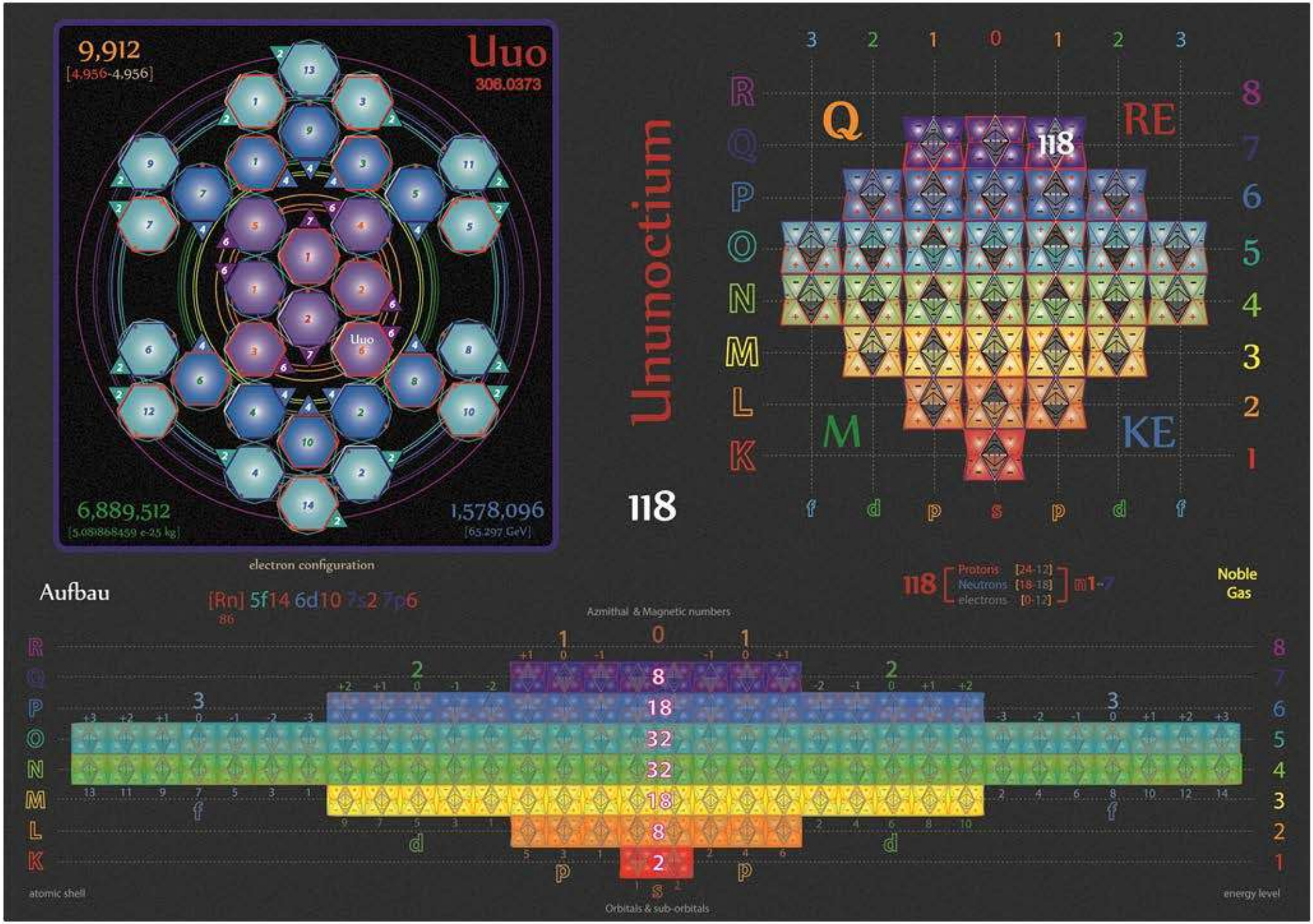

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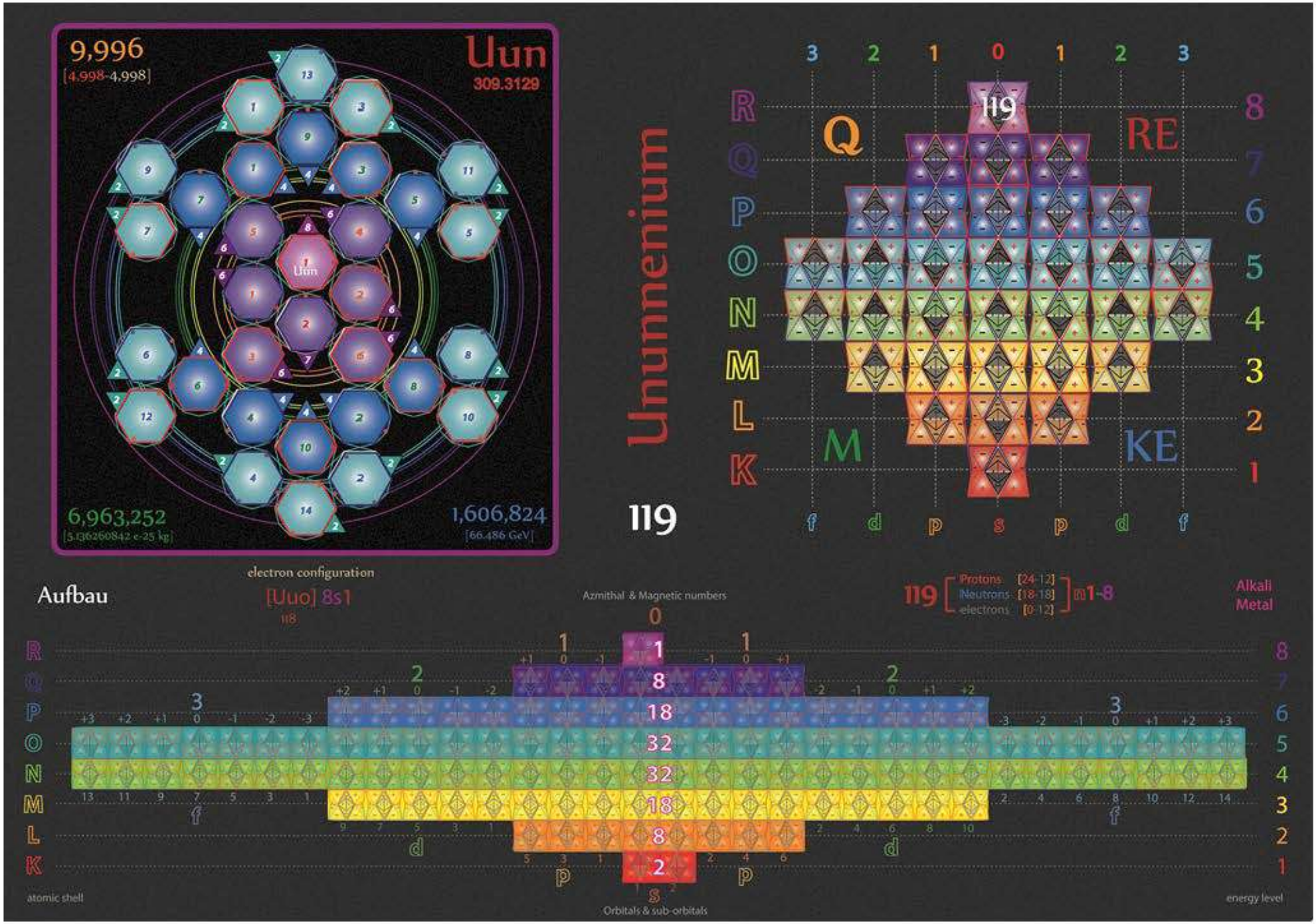

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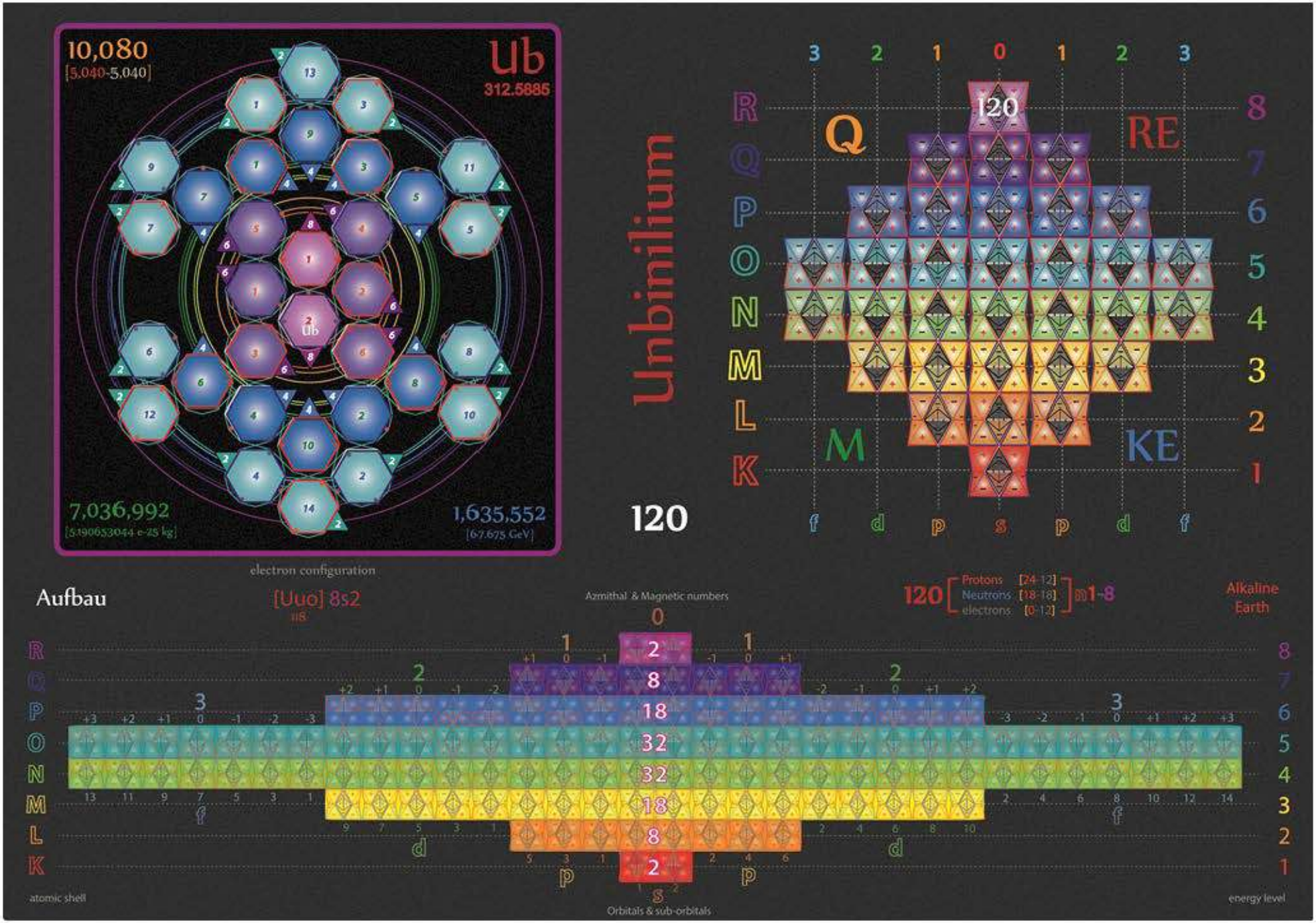

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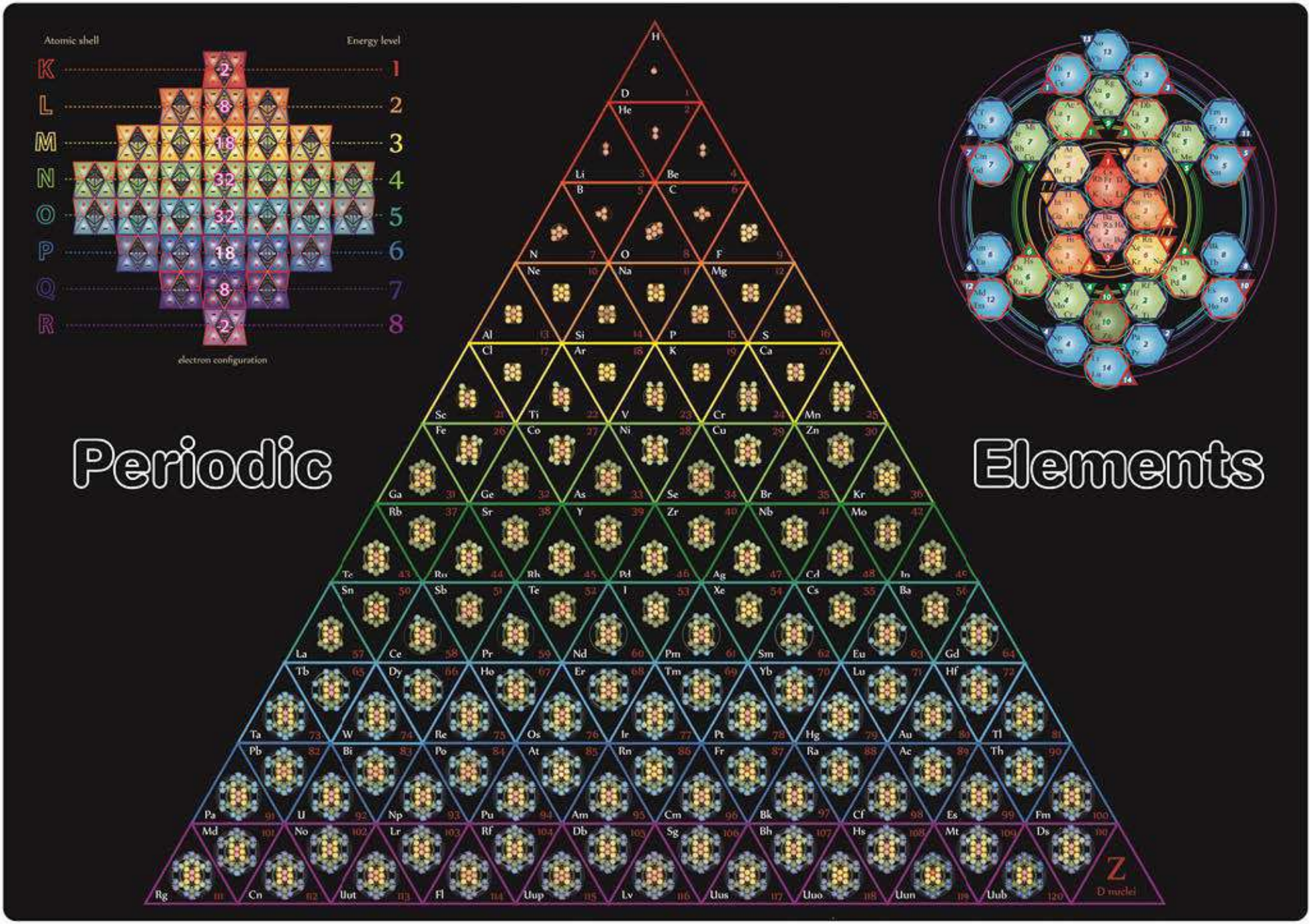

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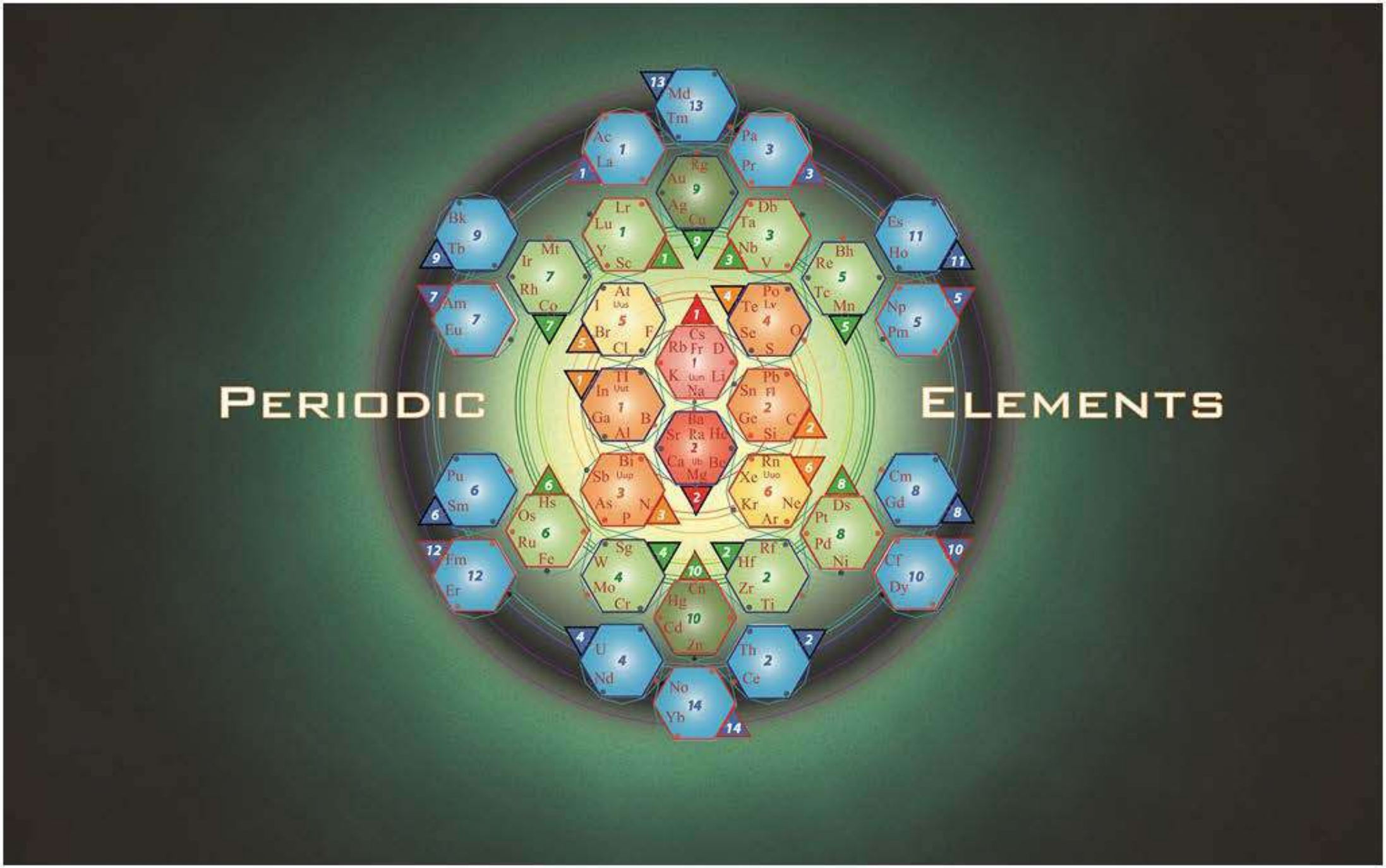
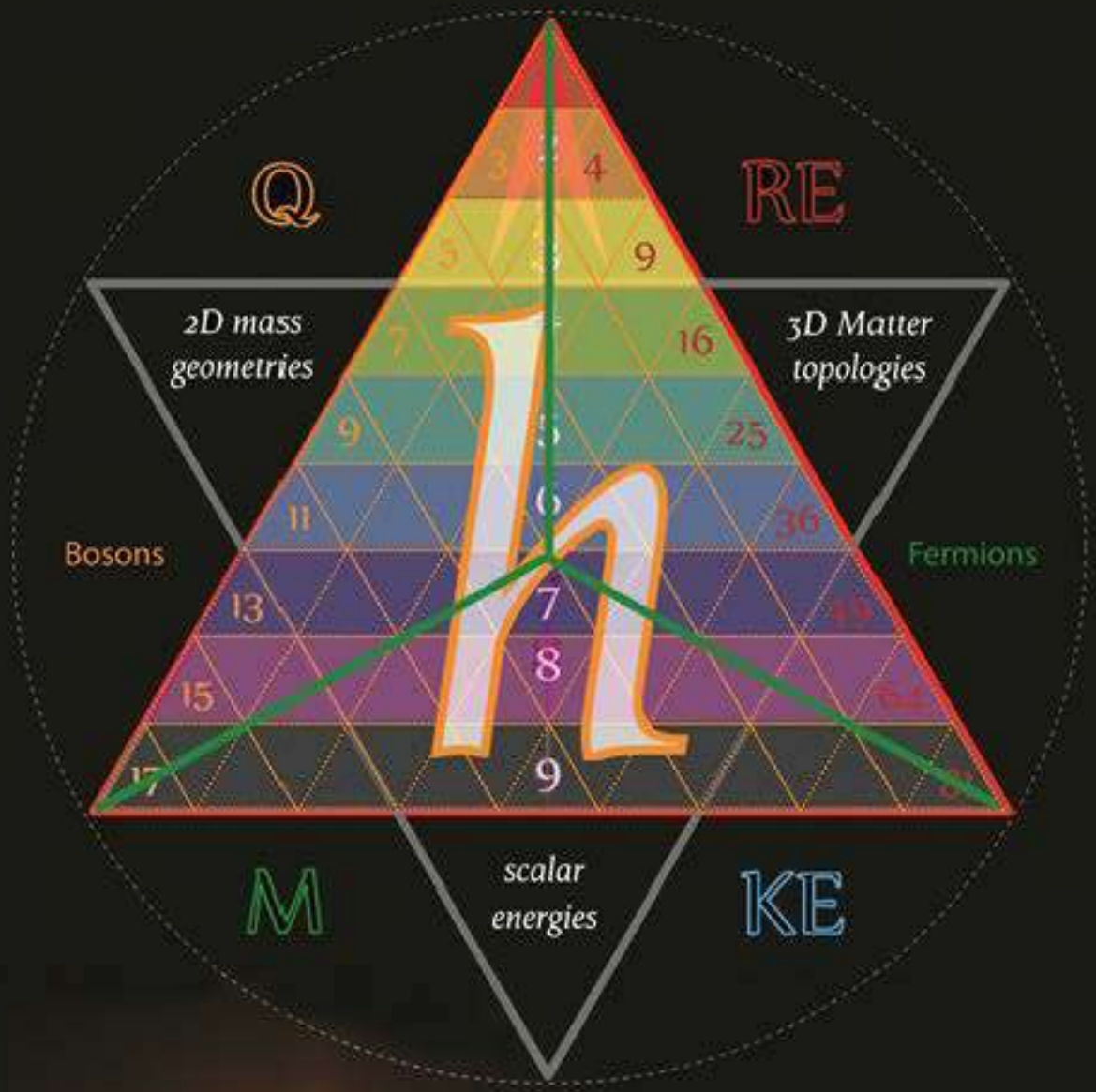


TETRYONICS

The charged geometry of mass-ENERGY-Matter



Foundational Quantum Mechanics

Abraham

ISBN 978-0-9872884-1-7

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questions **Q**

FUNDAMENTUM QUANTUM MECHANICA

A answers

[TETRYONICS]

A fundamental re-interpretation of the geometry of quantised angular momentum is required to complete the physics of 'The Standard model'

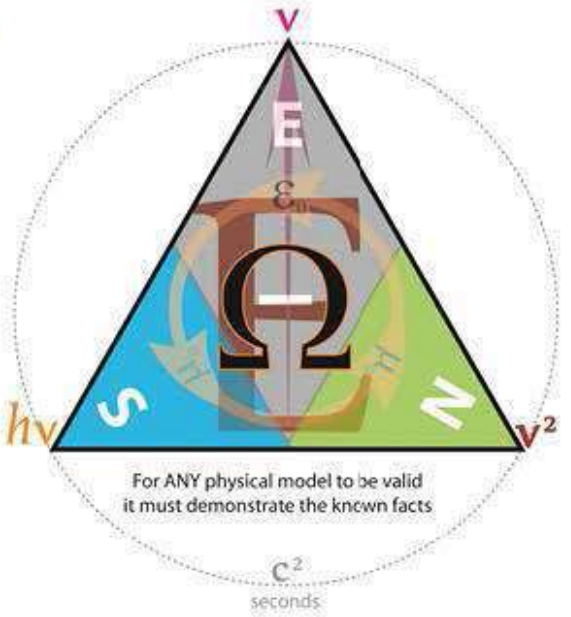
Mathematics is the language of Physics, and Geometry is its grammar

Philosophiae Naturalis Principia geometricae

Having removed the impossible, anything that remains, however improbable, must be the truth

"...the scientist makes use of a whole arsenal of concepts which he imbibed practically with his mother's milk; and seldom if ever is he aware of the eternally problematic character of his concepts. He uses this conceptual material, or, speaking more exactly, these conceptual tools of thought, as something obviously, immutably given; something having an objective value of truth which is hardly even, and in any case not seriously, to be doubted. ...in the interests of science it is necessary over and over again to engage in the critique of these fundamental concepts, in order that we may not unconsciously be ruled by them."

[Albert Einstein]



Science is born from observation, and the reasoning of known facts in search of underlying truths

In the following pages the true geometry of quantum mechanics is revealed, leading scientific endeavour into new realms of understanding

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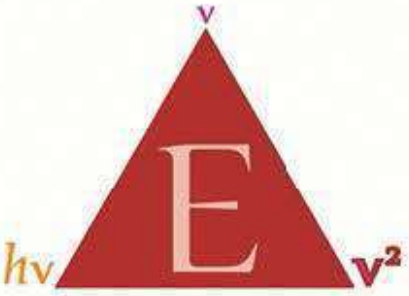
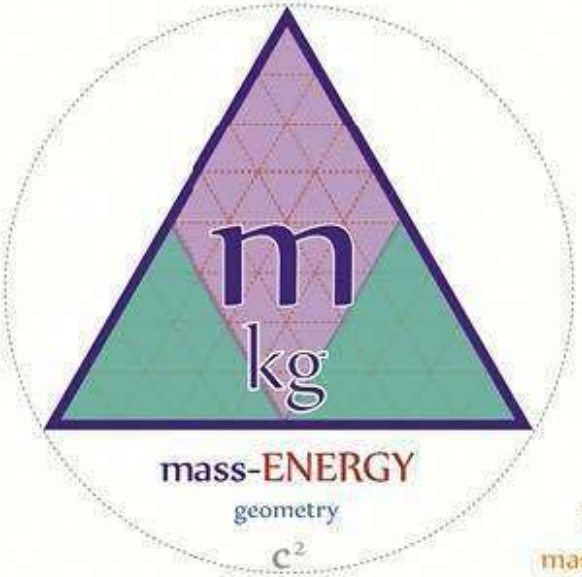
mass-ENERGY-Matter

The a-priori revelation of Tetryonic theory is that all square mass-energies possess equilateral momenta geometries

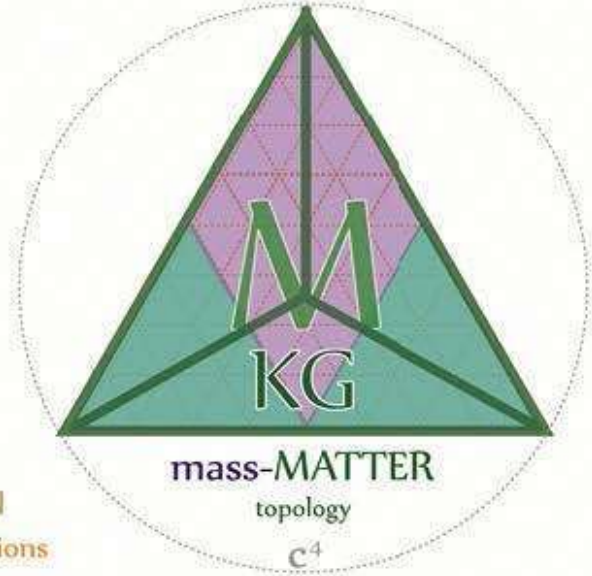
The equilateral Quantised Angular Momentum intrinsic to Planck mass-energy momenta produces charged geometries



The quantum mechanics of velocity, quanta, EM fields and mass-Energy-Matter can be fully revealed through their equilateral geometries



A long hidden topology is revealed



Equilateral triangles are the foundational geometry for all mass-ENERGY-Matter topologies and physical Force interactions

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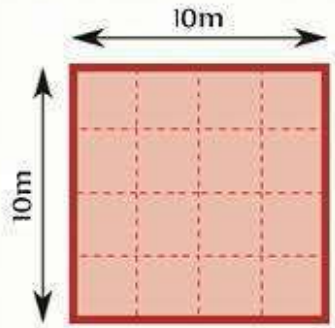
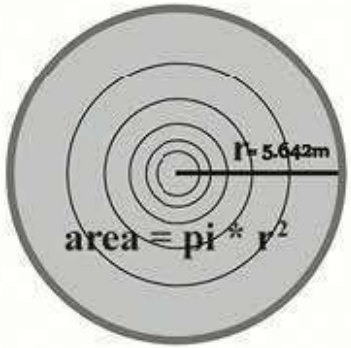
SQUARED energies in quantum mechanics are EQUILATERAL geometries



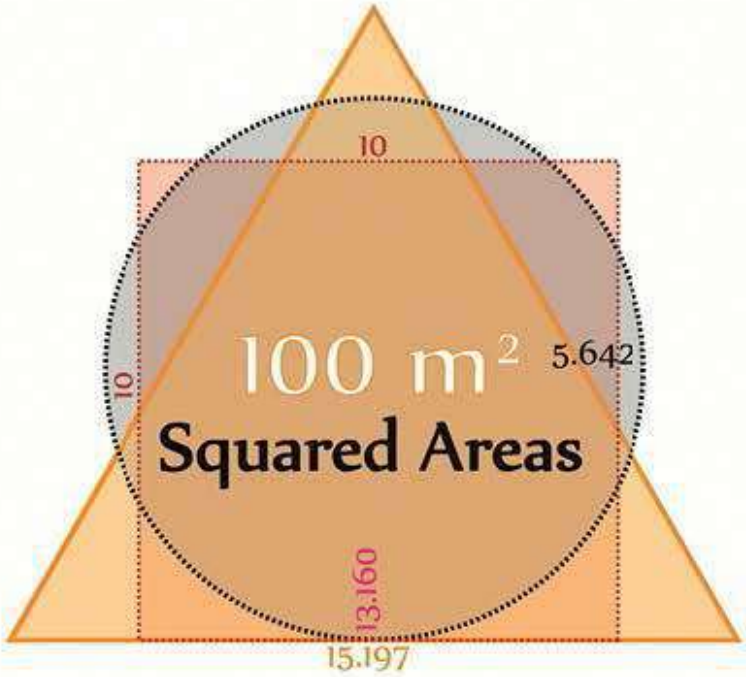
Square

area = s^2 = [100]

Circles



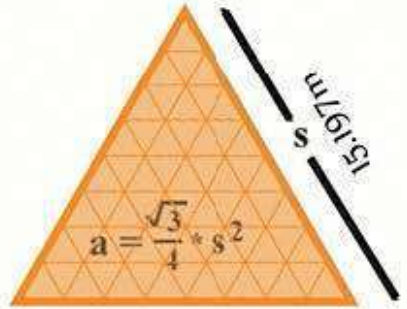
= pi *$[5.642]^2$
= 100



can be created by a number of planar geometries

For a long time it has been assumed by scientists (and mathematicians) that circular [and squared] geometries are the geometric foundation of all physics, leading to a seriously flawed model of particles and forces in quantum mechanics

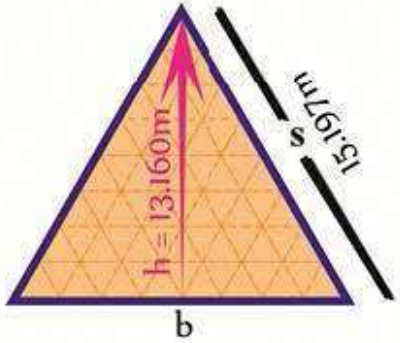
Tetryonic theory now reveals that quantised equilateral angular momenta creates the foundational geometry of all the mass-Energy-Matter & forces of physics



Equilateral

area = $(\frac{1}{2}*b)*h$

Triangles



b h
[.5x15.197] x 13.160
= 100

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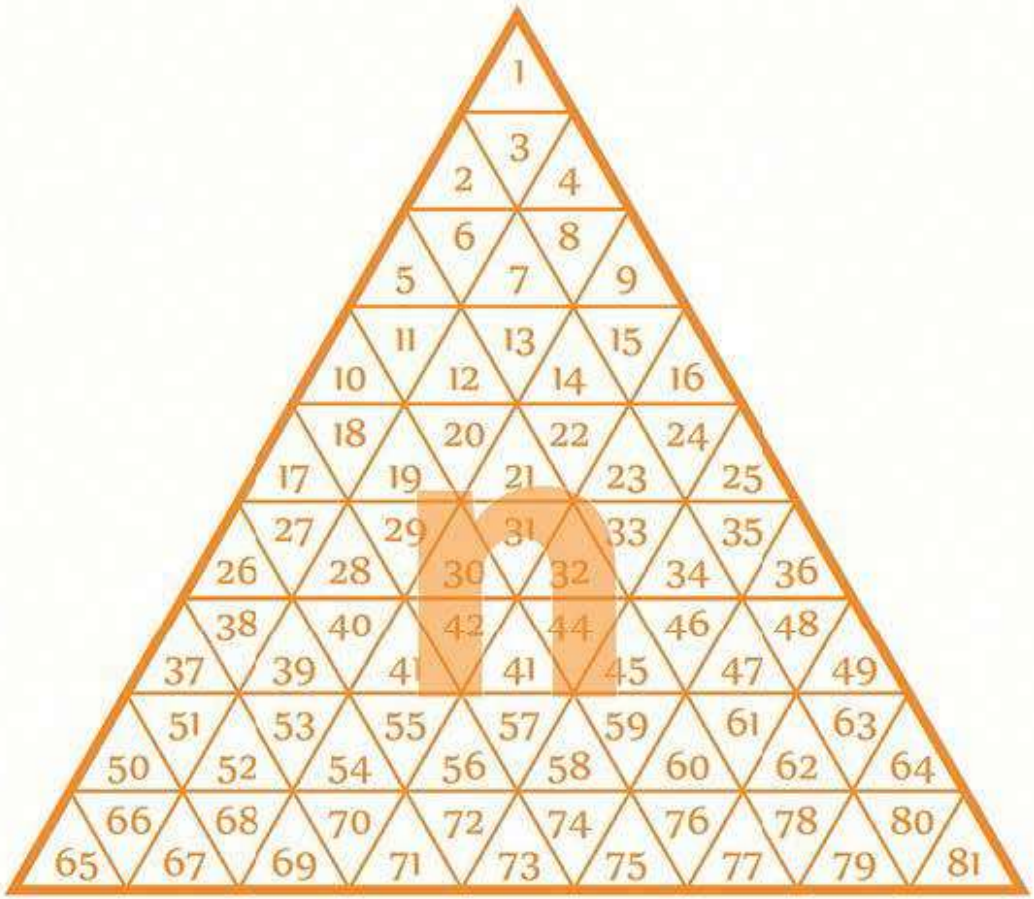
Integers

The integers (from the Latin integer), literally "untouched", hence "whole"
in Tetryonics it is the basis for the quantum



Viewed as a subset of the real numbers, they are numbers that can be written without a fractional or decimal component

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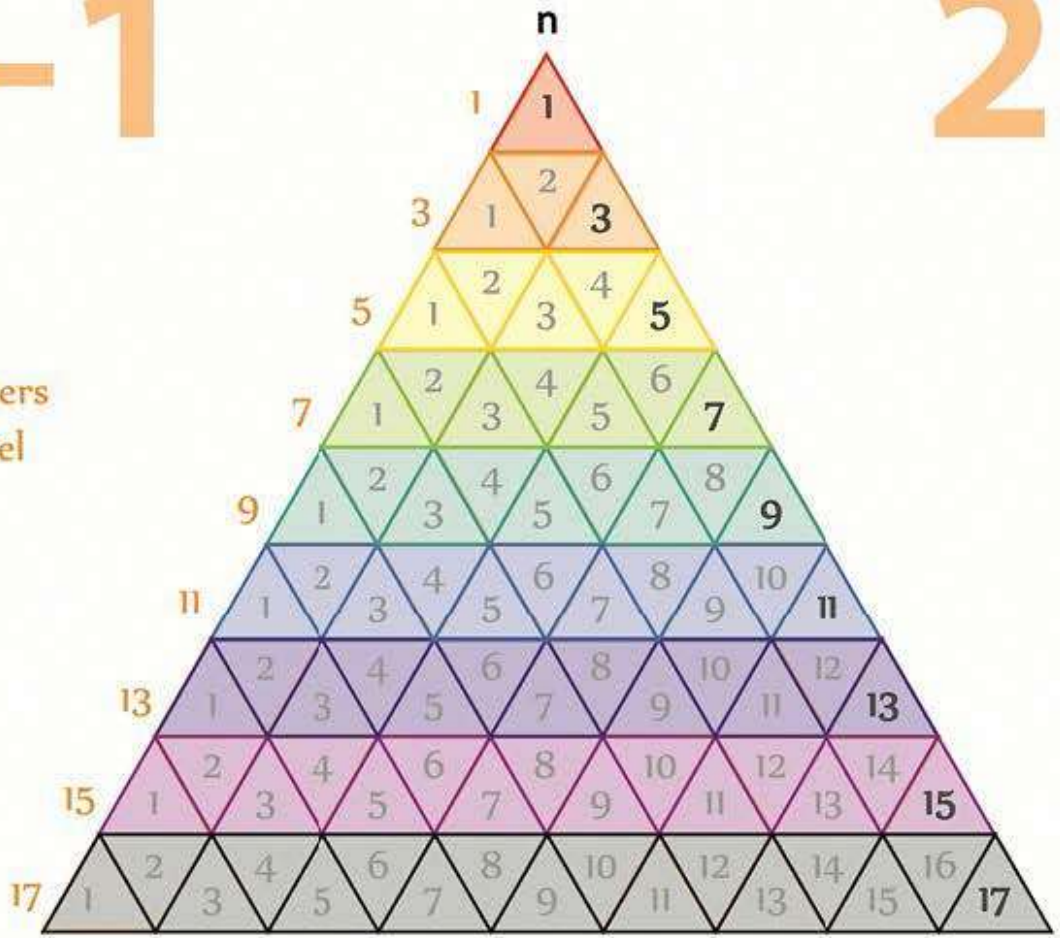
ODD numbers

An odd number is an integer which is not a multiple of two.

2n-1

2n+1

ODD numbers in each level



Bosons have ODD number quanta

An odd number, when divided by two, will result in a fraction

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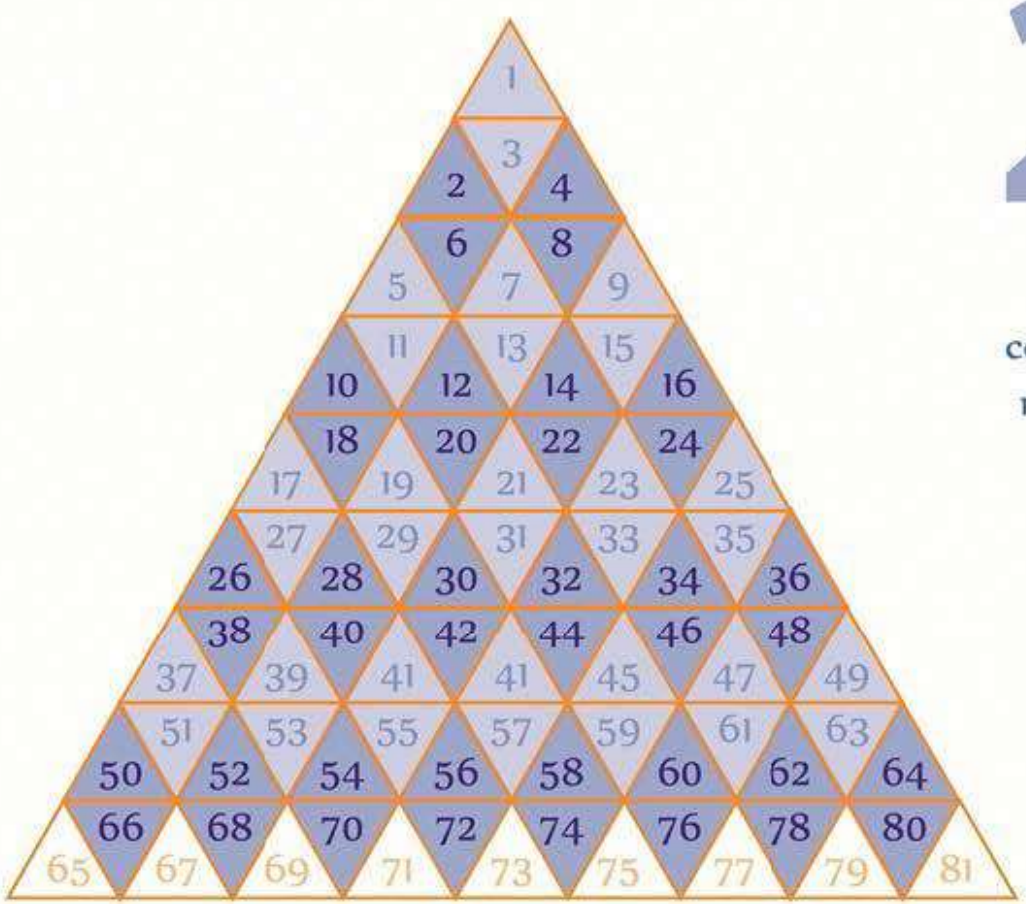
EVEN numbers

An integer that is not an odd number is an even number.

2

Photons have EVEN number quanta



2n

EM waves are comprised of EVEN numbered quanta

An even number is defined as a whole number that is a multiple of two.
If an even number is divided by two, the result is another whole number.

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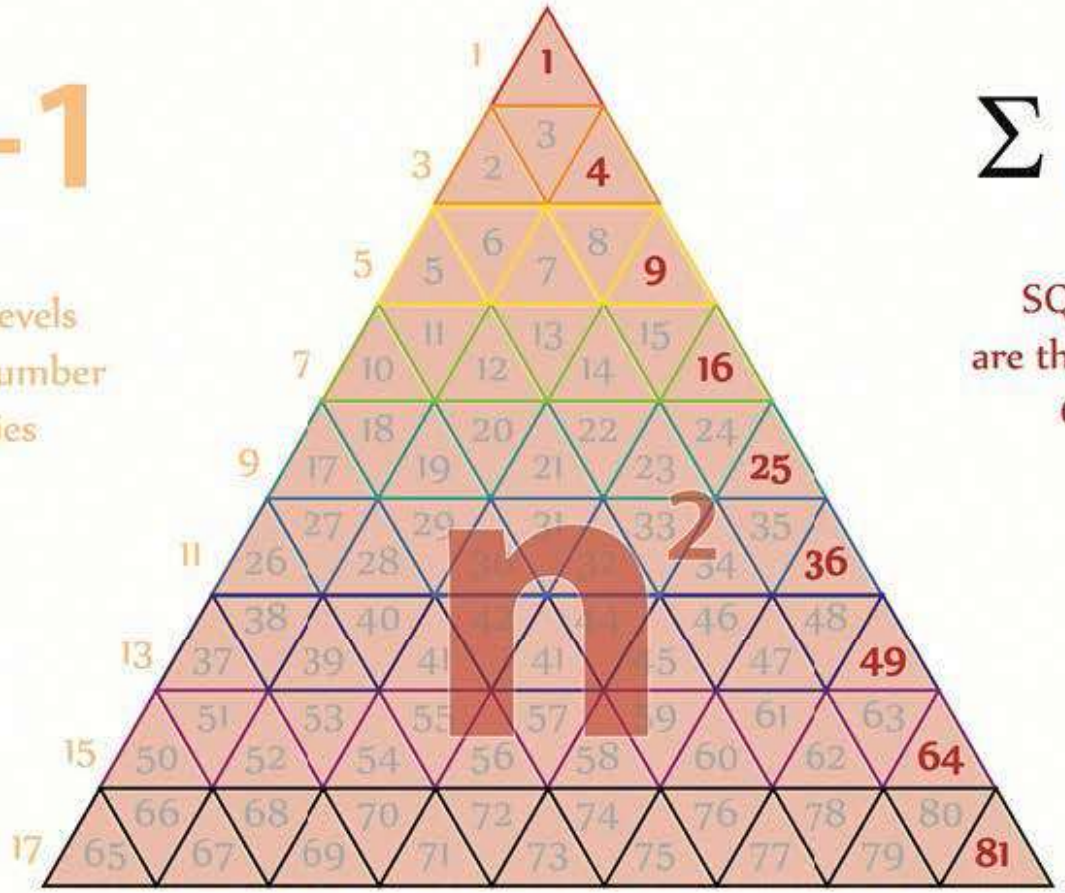
Square numbers

A square number, sometimes also called a perfect square,
is the result of an integer multiplied by itself

2n-1

Quantum levels
have ODD number
geometries



Σ 2n-1

SQUARE numbers
are the sum of successive
ODD numbers

In Tetryonics SQUARE numbers are EQUILATERAL geometries

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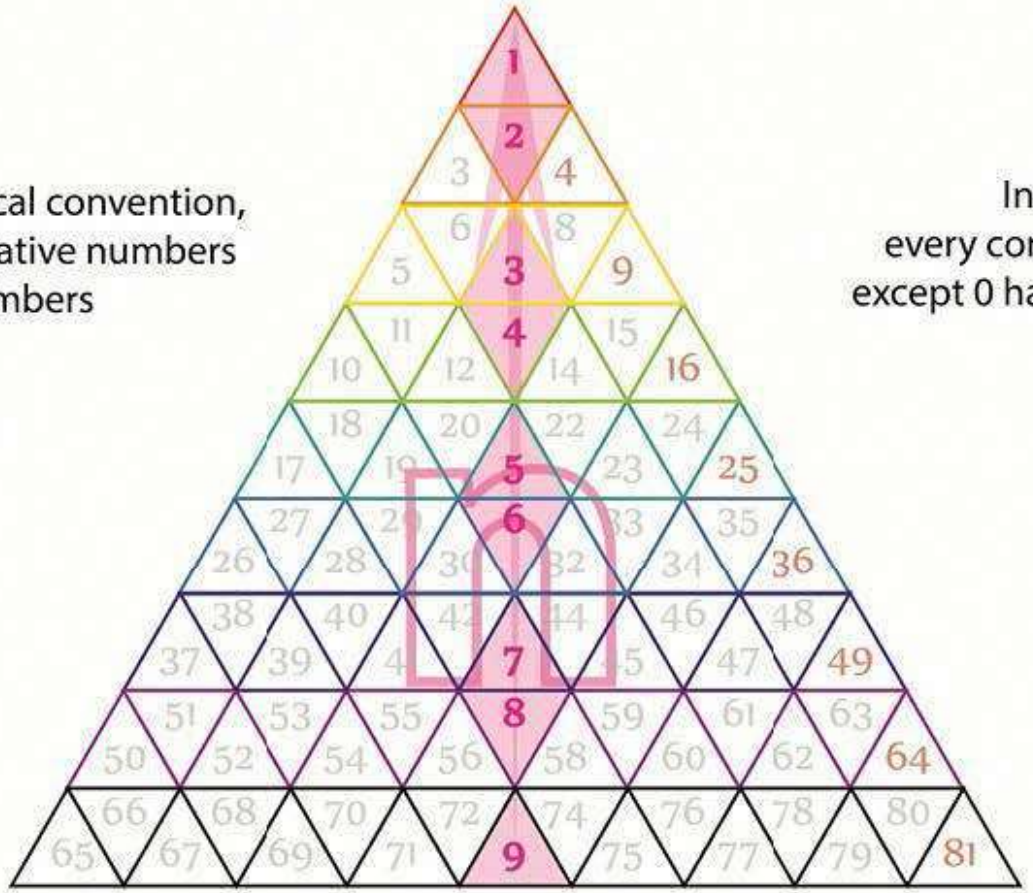
Square roots

A square root of a number is a number that, when it is multiplied by itself (squared) , gives the first number again.

$-i$ and $+i$

Against Mathematical convention, square roots of negative numbers are real numbers

In Physics every complex number except 0 has 2 square roots.



2n-1

n^2

A whole number with a square root that is also a whole number is called a perfect square

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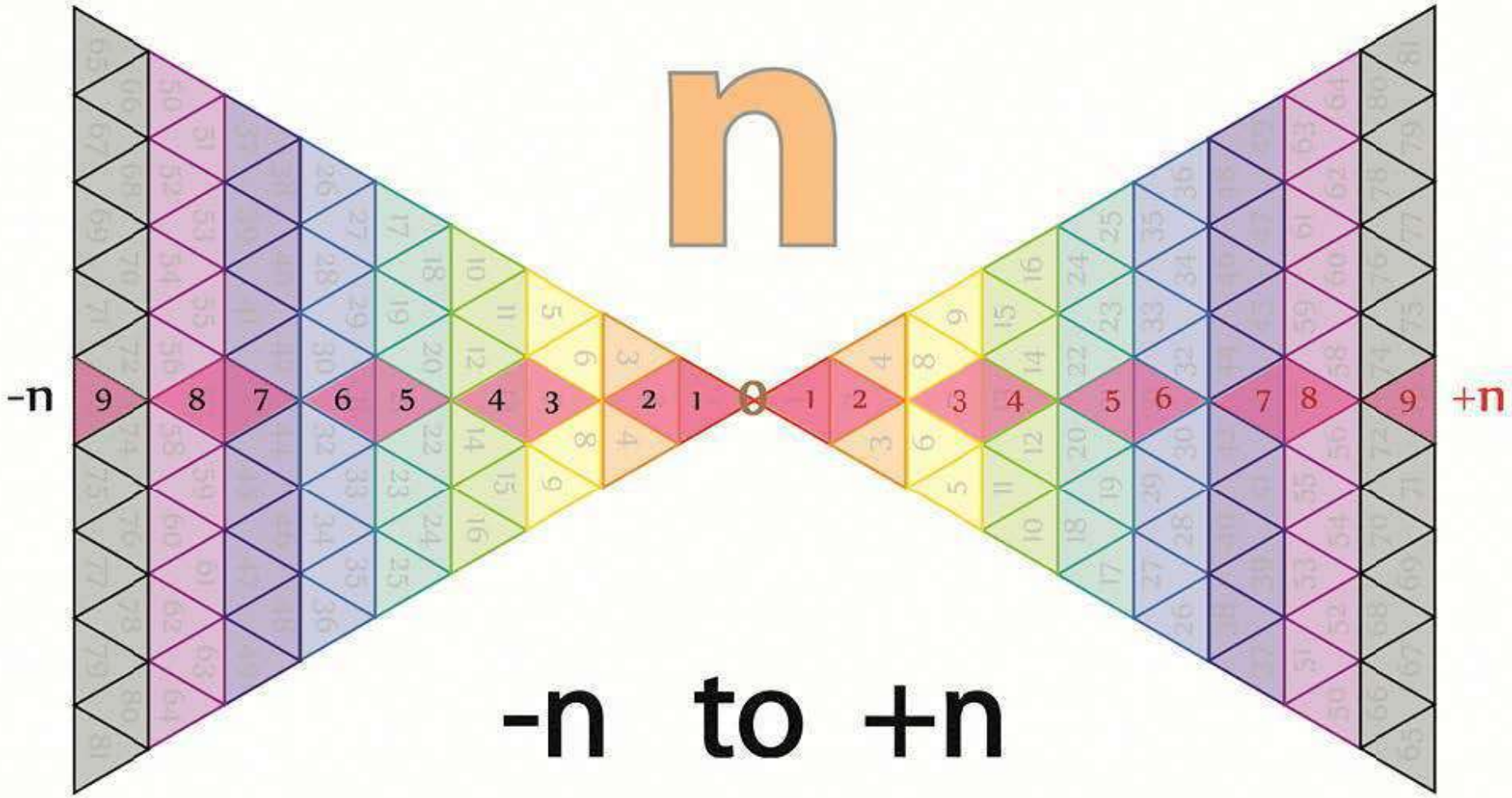
Real Numbers

A real number is a value that represents a quantity along a continuous line.

The real numbers include all the rational numbers,



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Irrational Numbers

An irrational number is defined to be any real number that cannot be written as a complete ratio of two integers

$i^2 = -1$

$+i$ and $-i$

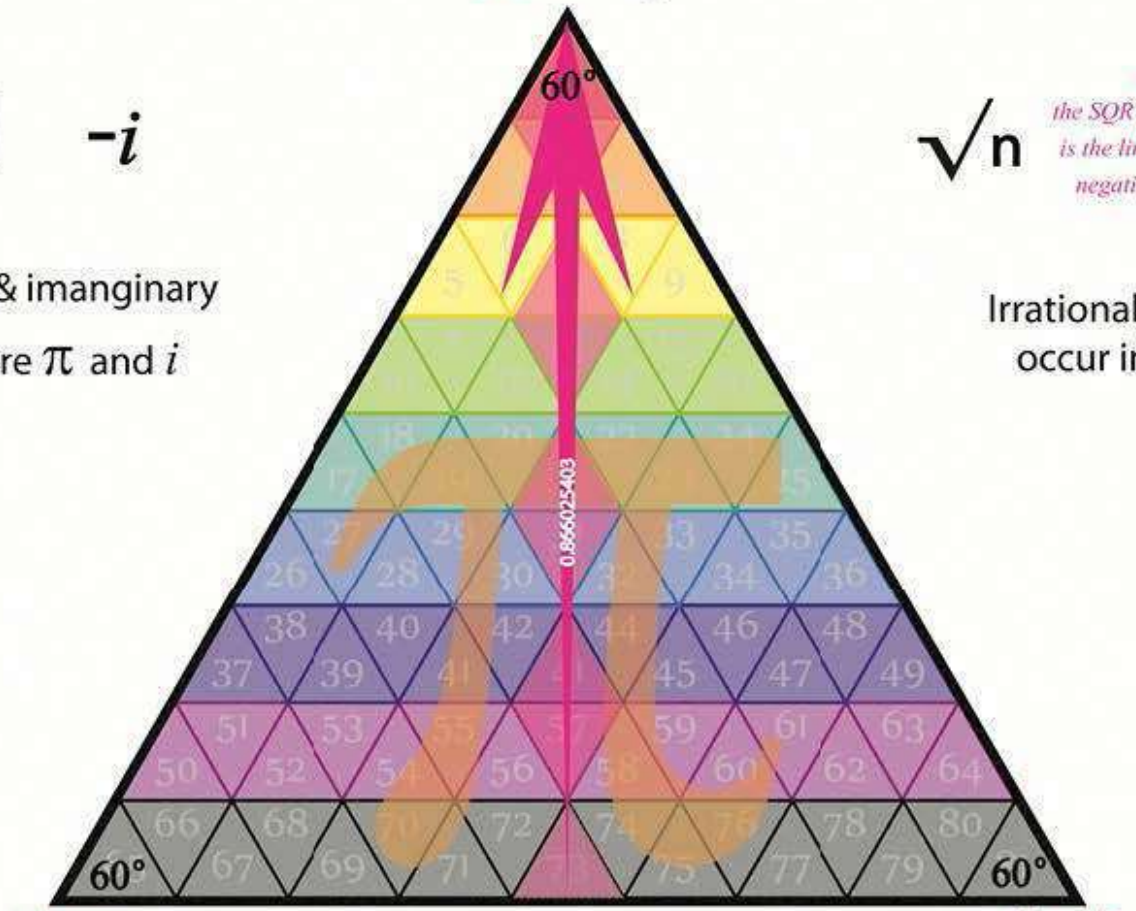
Well known irrational & imanginary numbers in Math are π and i

π

$\sqrt{n}$ *in Tetryonics the SQR of a negative number is the linear momentum of a negative charge EM field* $\sqrt{-n}$

Irrational numbers often occur in mathematics

$\sqrt{-n}$



Sin 60

Sin $\pi/3$

$\sqrt{3/2}$

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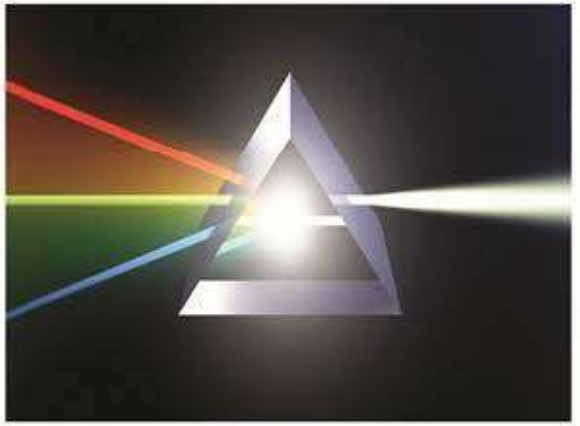
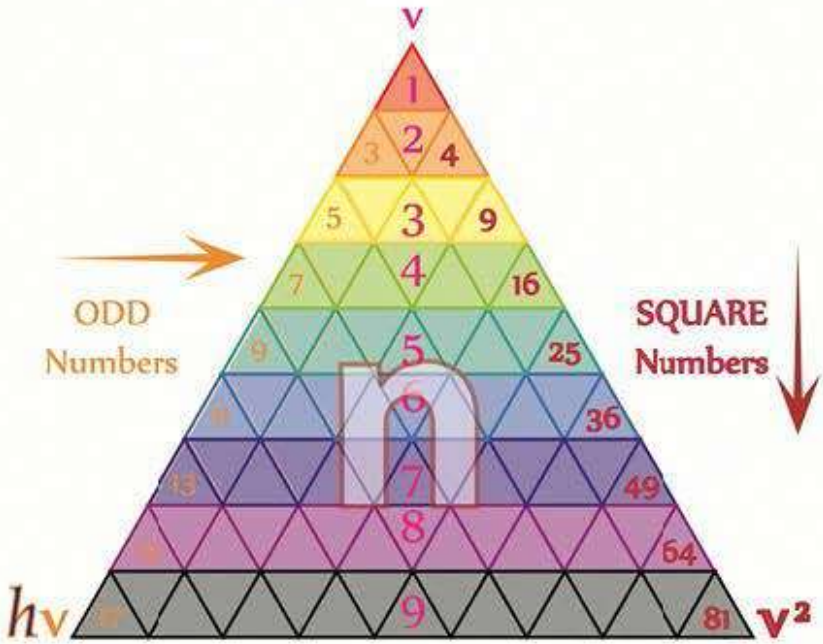
Tetryonic Colour Code

A colour code is used to indicate the varying quantum levels of the numerous forms of mass-ENERGY-Matter and serves to illustrate relationships between various Physical properties.



Tetryonics uses a colour code that is based on the spectral colours of dispersed White Light



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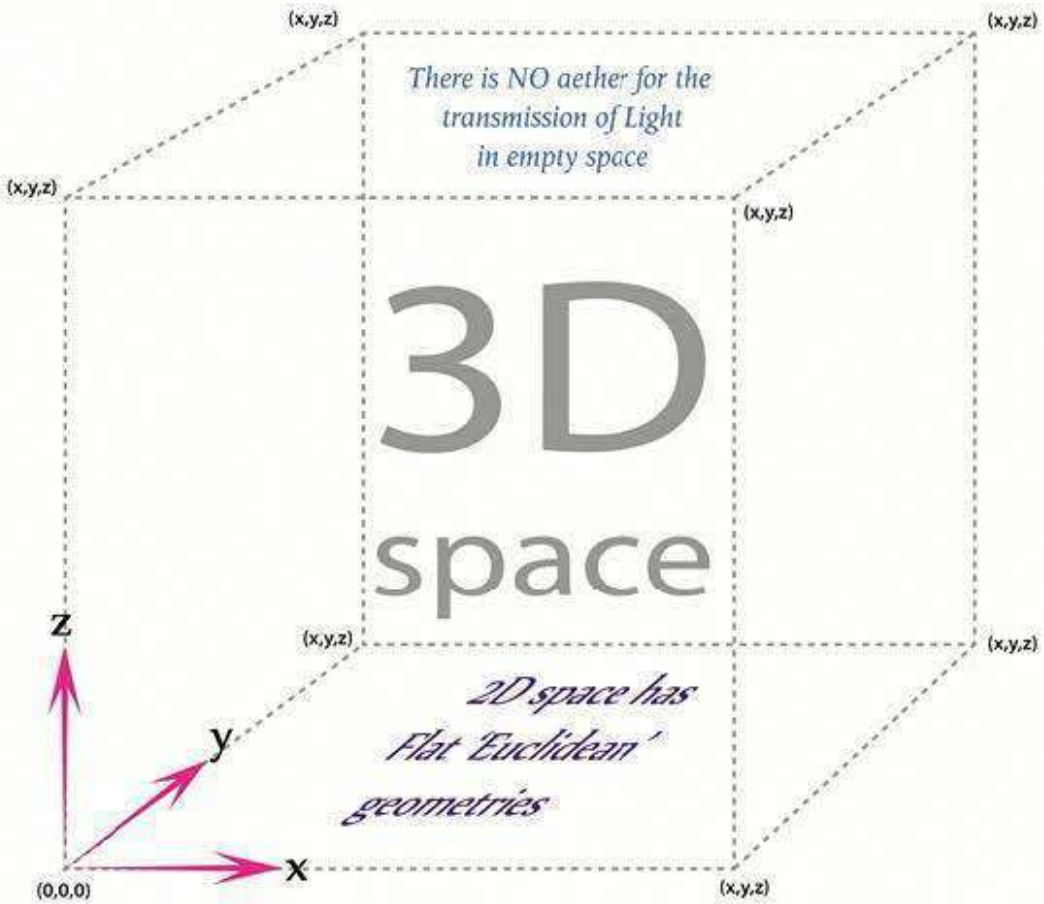
Free Space

A contiguous volume or area
of any regular geometry
that is free, available, or unoccupied

$E = 0$
in any form



A Spatial region
is defined so as to
measure the physics
of mass-ENERGY-Matter
within its confines

Energy moves through Space
in various forms:
radiant energies, Matter etc

Space can be
Cubic, Spherical or
Tetrahedral as defined by
the spatial co-ordinates
used to define the region

Empty Space is defined as a topology whose volume is devoid of Energy

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Space-Time co-ordinates

Charge radiates unilaterally in line with its vector linear momentum

Vector forces

The linear vector of divergent Energy forms various co-ordinate systems based on its vector directions per unit of Time

Euclidean planar space-time

Time in Physics is a measure of how long it takes for light to travel 299,792,458 metres from its source in a vacuum

c
299,792,458
linear metres
per sec

c^2
8.987551787 e16
radial square metres
per sec

metre

299,792,458 sec

A metre in Physics is the distance light travels in 1/ 299,792,458 of a second from its source

299,792,458 m
second

c^3
2.694400242 e25
cubic metres
per sec

c^4
8.077608713 e33
spherical metres
per sec

Cartesian rectilinear space time

Cartesian and Curvilinear spatial co-ordinate systems both measure 3D Matter

Riemannian curvilinear space-time

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Spatial geometries

based on the vector speed of Light
form distinct spatial co-ordinate systems
for the measurement of physics

vector lines

1 Dimensional velocity

linear metres

Planar Circles

2 Dimensions

c^2

velocity squared

radial seconds

Cubic volumes

z

3 Dimensions

velocity cubed

c^3

y

x

Cartesian co-ordinates

Spherical volumes

declination

3 Dimensions

ascension

c^4

quarternion velocity

radial seconds²

Forces

m

2D planar radiant geometry

mass-energies

Energy has an equilateral geometry and forms Tetrahedral topologies within any spatial region

M

3D standing-wave topology

mass-Energy-Matter and all forces

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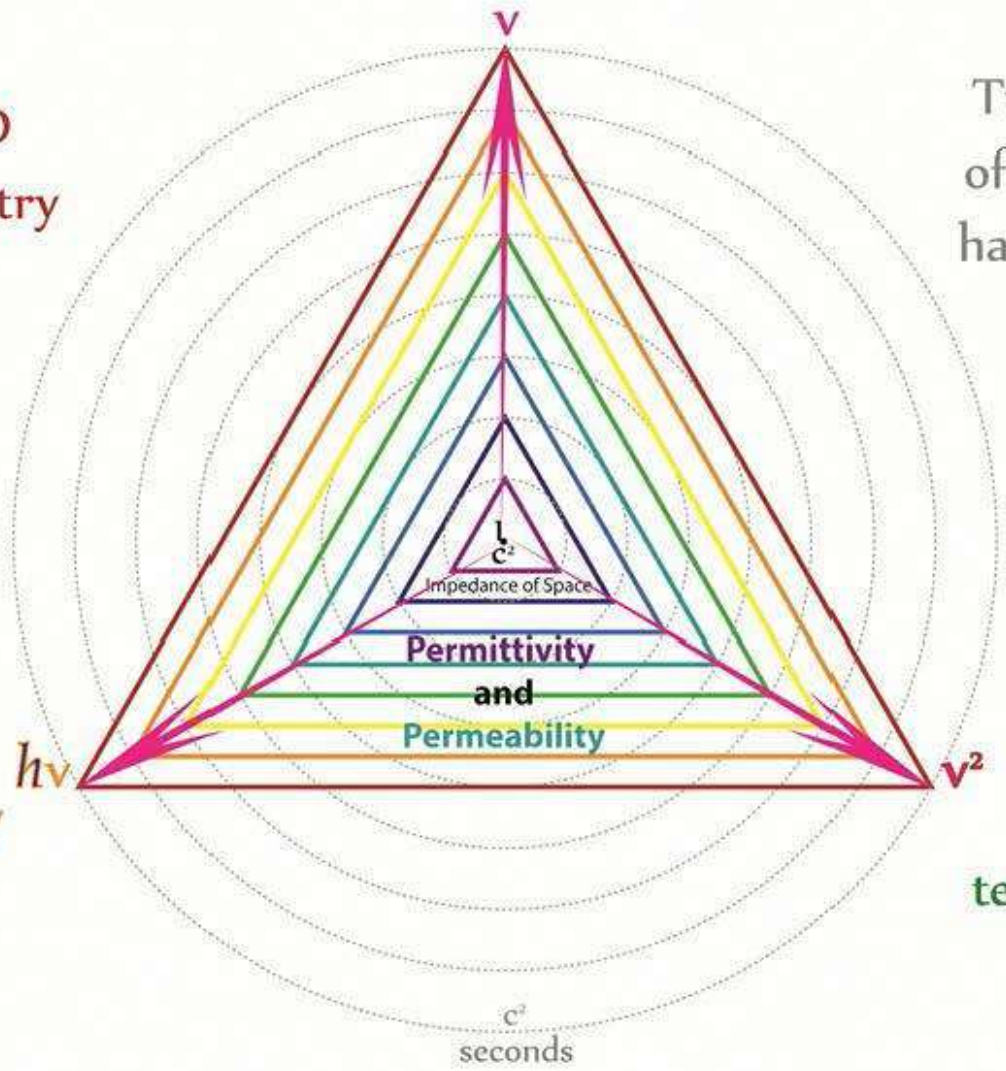
c is the natural velocity of light

Energy has a 2D equilateral geometry [Euclidian]

Time - as a measure of divergent energies has a radial geometry



Equilateral geometry is the inverse of radial geometry

3D Matter has a tetrahedral mass-energy topology

The scalar spatial geometry of Energy

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Velocity

Velocity is the measurement of the rate and direction of change in the position of an object.

It is a vector physical quantity; both magnitude and direction are required to define it.

The absolute scalar value (magnitude) of velocity is speed, a quantity that is measured in metres per second (m/s or ms−1) when using the SI (metric) system.

$$\frac{m}{s}$$

Speed is the scalar value of the
Distance traveled per unit of TIme

$$\bar{\mathbf{v}} = \frac{\Delta \mathbf{x}}{\Delta t}.$$

Velocity is the vector value of the
Distance traveled per unit of Time

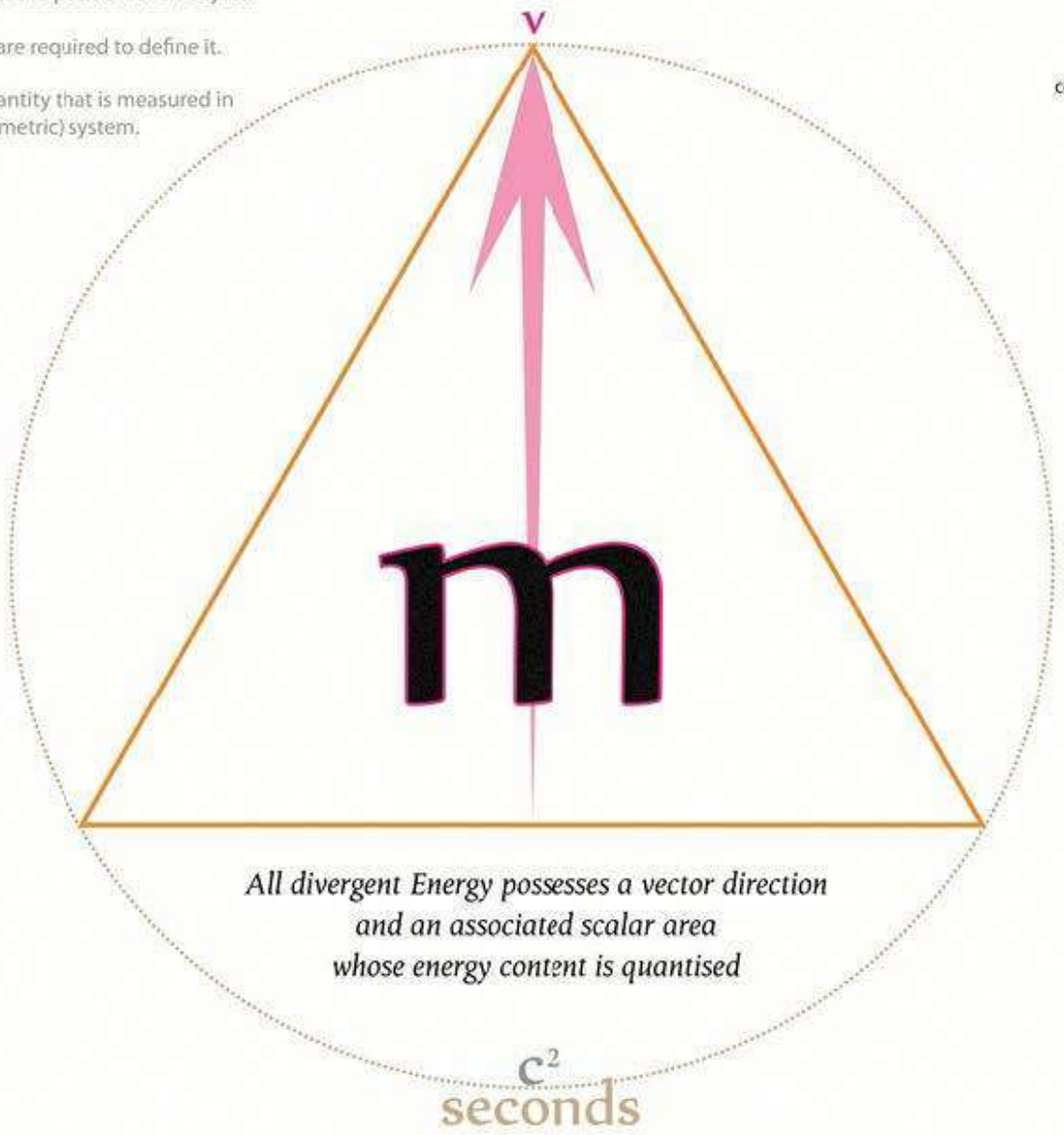
$$\frac{\overrightarrow{m}}{s}$$

v Velocity $\frac{m}{s}$

sec

c^2

is a 2D RADIAL
SPACE-TIME
co-ordinate system



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sec^2 / c^4

is a 3D SPHERICAL SPACE-TIME co-ordinate system

Acceleration

a acceleration $\frac{m}{s^2}$

In physics, acceleration is the rate of change of velocity [dv] over time [dt]

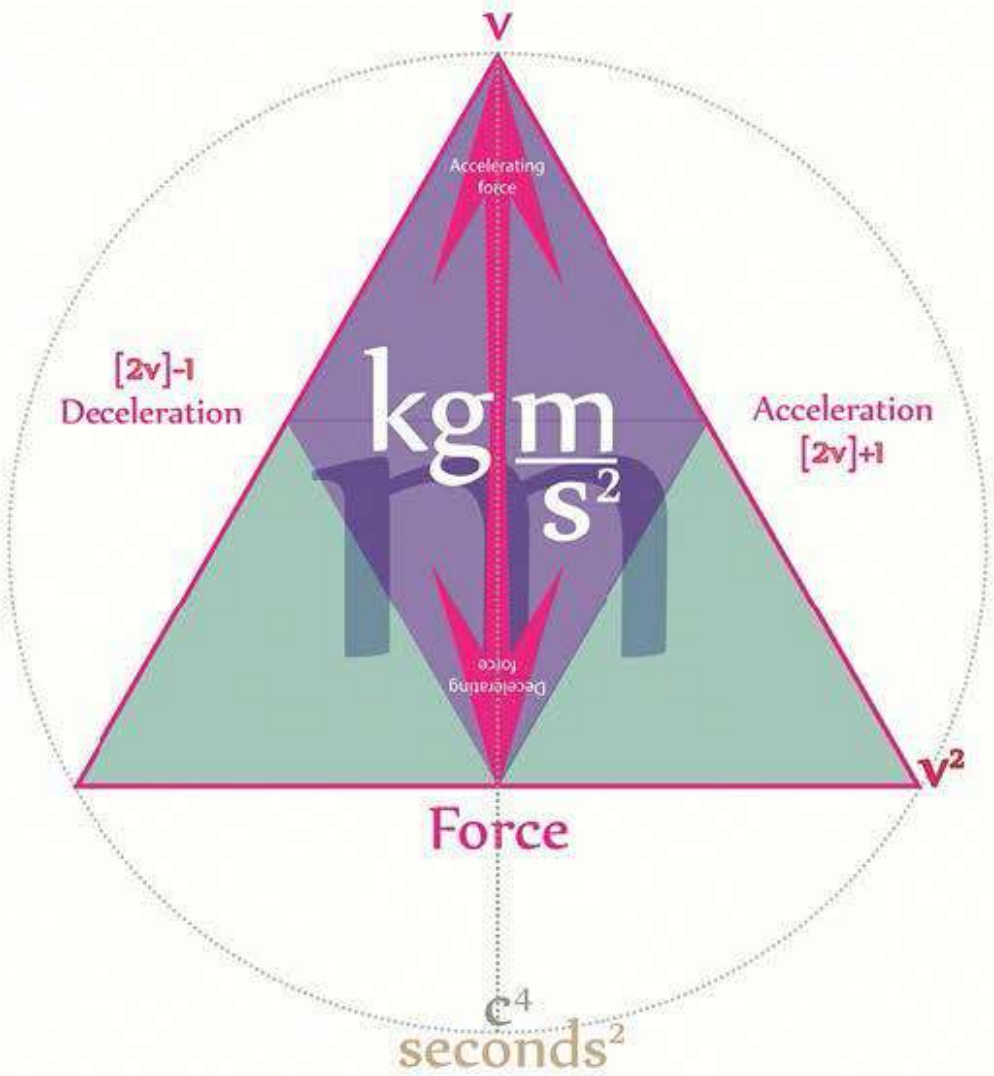
In one dimension, acceleration is the rate at which something speeds up or slows down.

However, since velocity is a vector, acceleration describes the rate of change of both the magnitude and the direction of velocity.

Acceleration has the dimensions [Length]/[Time Squared]
In SI units, acceleration is measured in meters per second squared (m/s^2).

$$a = \frac{\Delta y}{\Delta x} = \frac{\Delta v}{\Delta t}.$$

In classical mechanics, for a body with constant mass,
the acceleration of the body is proportional to the net force acting on it
(Newton's second law)



$F=ma \longrightarrow a=F/m$

Force $\frac{kg\,m}{s^2}$

Additionally, for a mass with constant velocity,
(ie in an inertial frame)
the energy of motion is expressed as its momentum
(acceleration causes changes in Energy-momentum)

$p = \frac{kg\,m}{s}$

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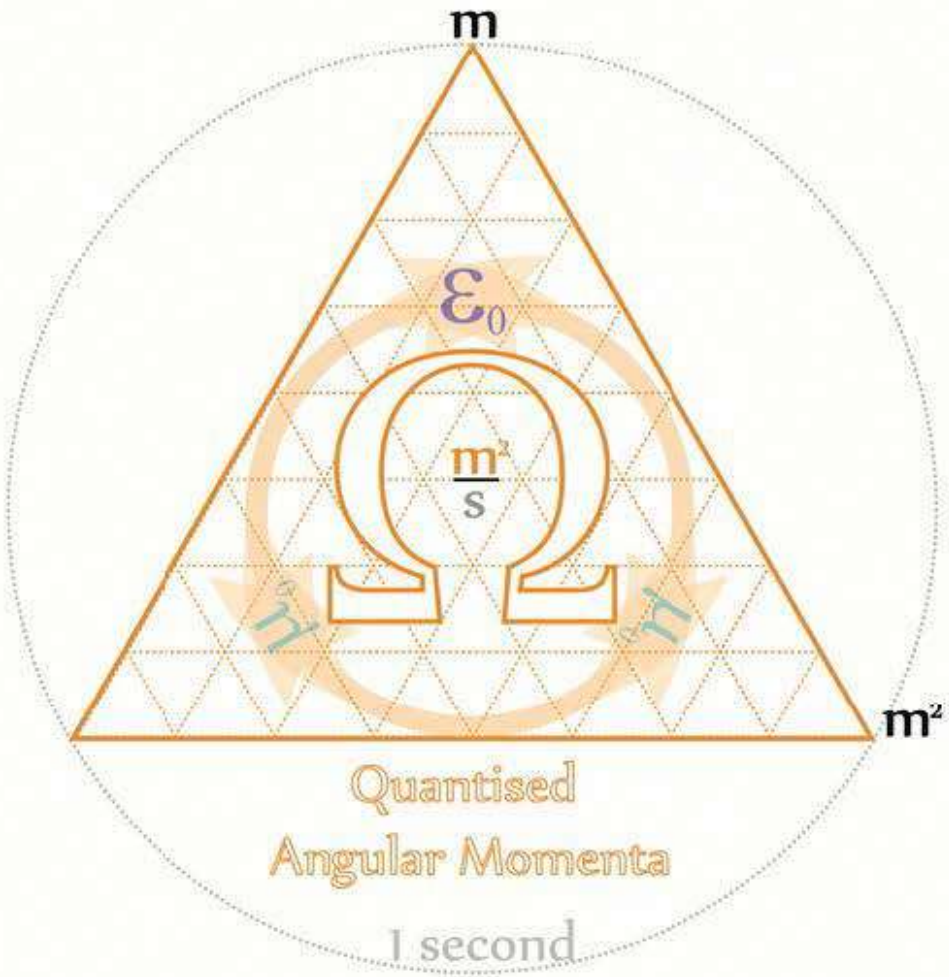
Quantised Angular momentum

As it is a physical [equilateral] geometry QAM is conservative in any system where there are no external Forces and serves as the foundational geometric source for all the conservation laws of physics



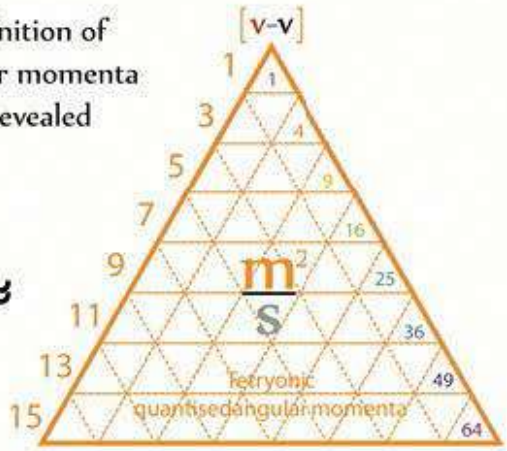
Conservation of Quantised Angular momenta

In QFT, angular momentum is is considered to be the rotational analog of linear momentum, in Tetryonics it is revealed to be the equilateral geometry of mass-energy within any defined spatial co-ordinate system

A major re-definition of quantised angular momenta in physics is revealed

classical rotational angular momenta

≈



Tetryonic quantum mechanics

In quantum mechanics, angular momenta is quantised – that is, it cannot vary continuously, but only in ODD number "quantum steps" between the allowed SQUARE nuclear Energy levels

In physics, angular momentum, moment of momentum, or rotational momentum is a conserved vector quantity that can be used to describe the overall state of a physical system.

When applied to specific mass-energy-Matter systems QAM reveals the true quantum geometry and nature of Energy in our universe

Planck's Constant

Normally viewed as an expression of rotational momentum Quantised Angular Momentum [QAM] is in fact a resul: of the equilateral geometric quantization of mass-energy

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mass - Energy geometry

Newton developed his Laws using Force
p = mv
(linear momentum)

Gottfried Leibniz first described Scalar Energy as the square of velocity

$E = mv^2$

Leibnitz mass-energy equivalence

mass velocity squared

$kg\frac{m^2}{s^2}$

Planck developed his Heat Law using quantised mass
h = mΩ
(Planck Constant)

Planck's equation for heat energy describes transverse masses [Bosons]

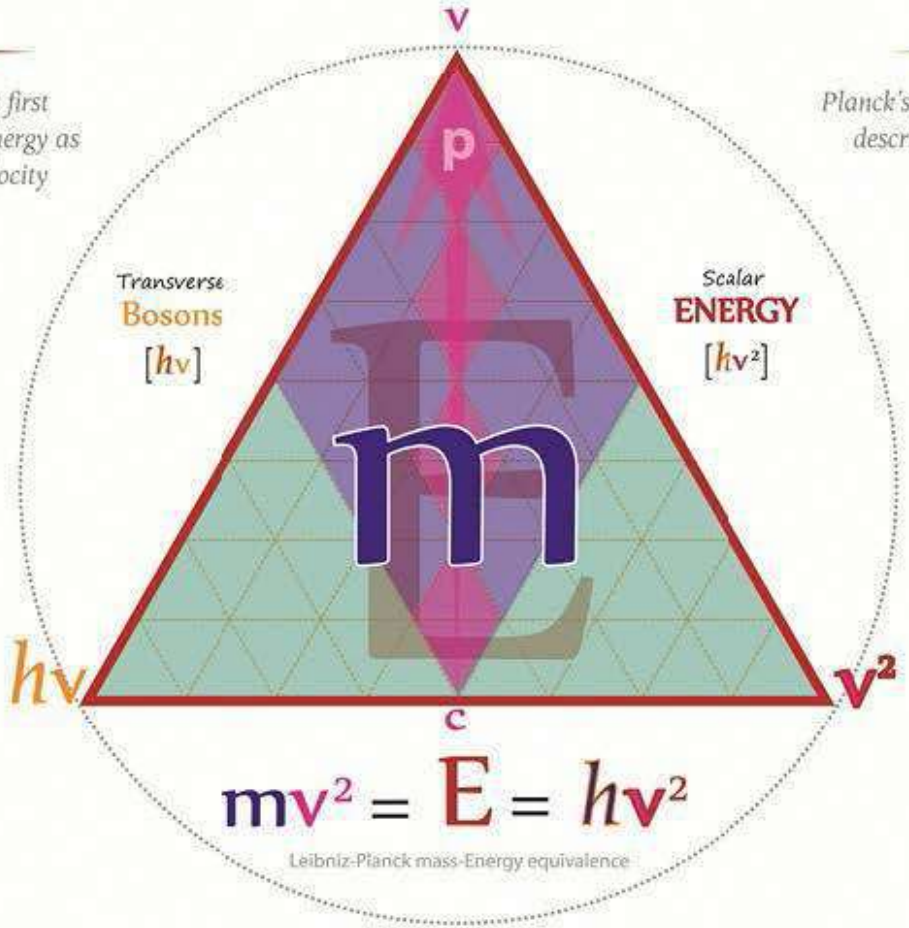
$E = nhv$

Planck mass-energy equivalence

quantised mass per second

Planck quanta per second

$\left[kg\frac{m^2}{\mathbb{S}}\frac{1}{s}\right]$



$mv^2 = E = hv^2$

Leibniz-Planck mass-Energy equivalence

scalar energies can be related to velocity-momenta through mass geometries

scalar

mv^2

Leibniz-Newton mass-Energy equivalence

$m\Omega v^2$

quantised

Tetryonic-Planck mass-Energy equivalence

hv^2

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mass-Energy Forms

Scalar/Linear forms

mass x velocity squared

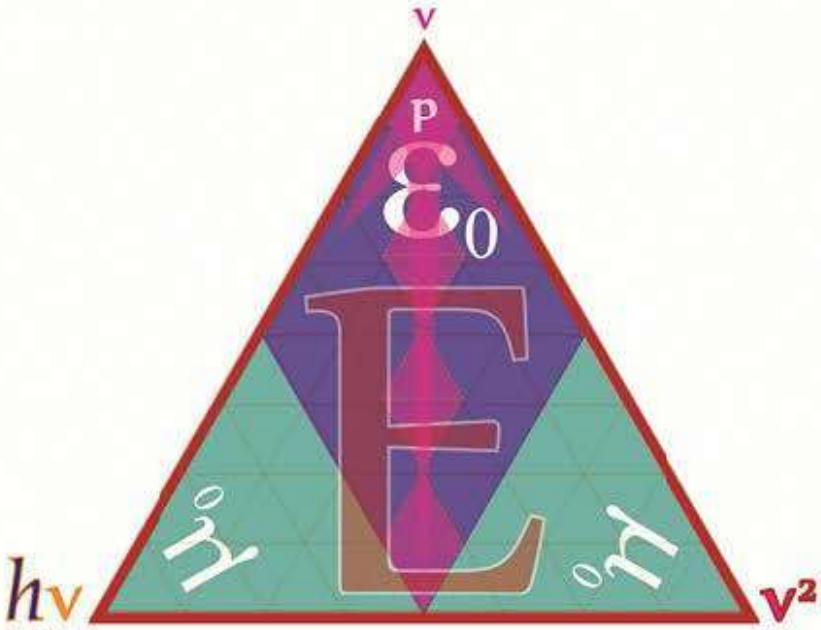
$$kg.\left[\frac{m}{s}\right]^2$$

Energy momentum

Leibniz (and Newton) showed that the Energy of a system can be viewed as a product of its mass x velocity squared or (equally as linear momentum squared), forever linking Energy to velocity through the scalar property of mass

$$mv^2 = E = p^2$$

Energy is the ability to do work in varying forms such as potential, kinetic, & mechanical energies, work, heat, and chemical or electrical energies.



$$mv^2 = E = hv^2$$

The total energy contained in an object is identified with its EM mass, and Energy (like mass), cannot be created or destroyed

Tetryonic reveals mass to be a scalar measurement of quantised [equilateral] energy per unit of Time

$$m[\Omega]v^2$$

Energy is subject to the law of conservation

Quantised form

Planck quanta per second

$$\left[kg.\frac{m^2}{s}\right].s^{-1}$$

mass-Energy quanta

Max Planck reveealed that energy was not continuous, it was quantized – only certain energies are allowed. Continuous energy is a scalar propertyo of mass-energy and its quantisation is the result of its equilateral geometry

$$E = hv^2$$

In quantum mechanics energy is defined in terms of the energy operator as a time derivative of the wave function

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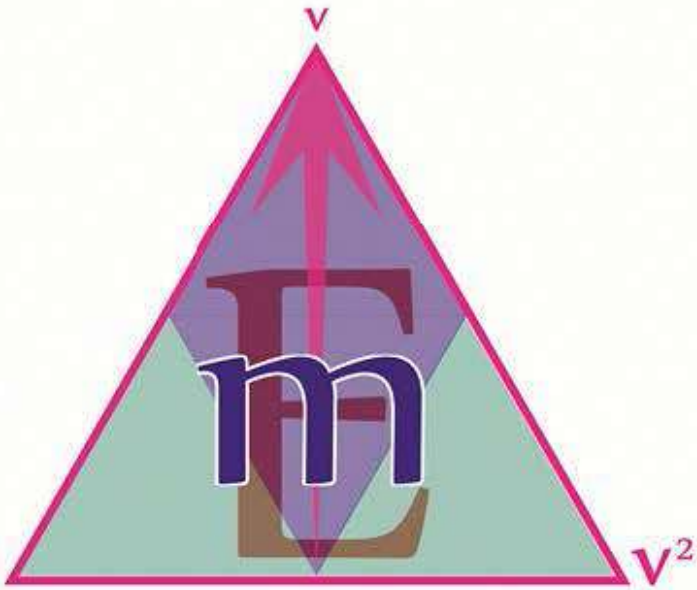
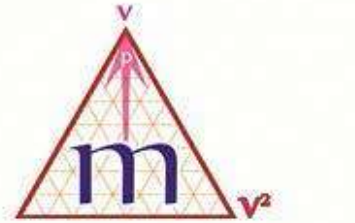
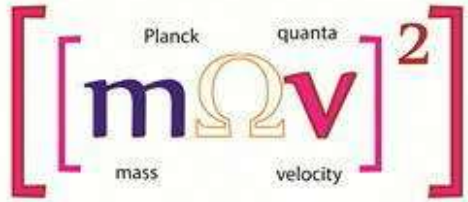


Energy is mass-velocity squared

$$E = mv^2$$

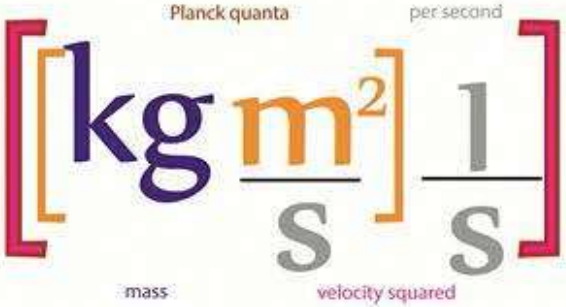




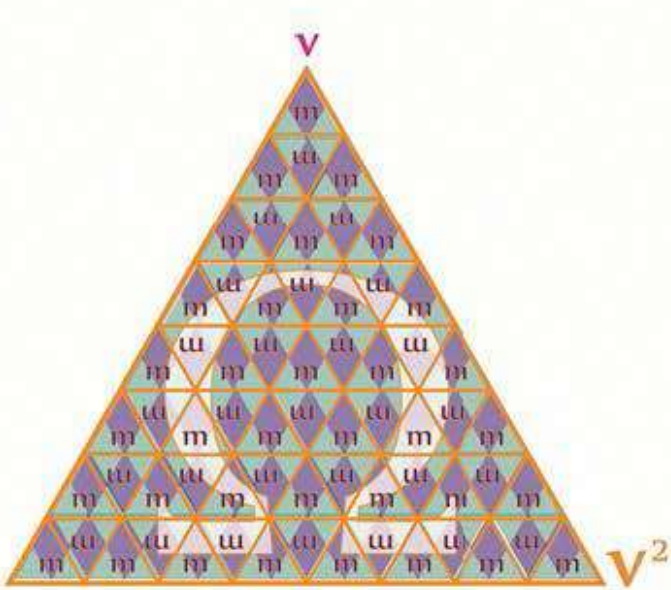
linear momentum squared

Everything in our Universe results from the equilateral geometry of quantised mass-energies

Quantised Energy

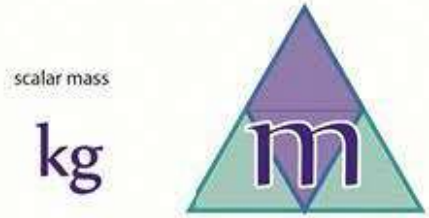


Scalar Energy



Energy is Planck-quanta squared

$$E = hv^2$$



$$m = \frac{E}{v^2}$$

$$h = \frac{E}{v^2}$$

Note: There is a direct correspondence between Velocity and Planck quanta numbers
(ie as velocity varies, the energy quanta varies as well by the square of the linear change)

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Linear Momentum

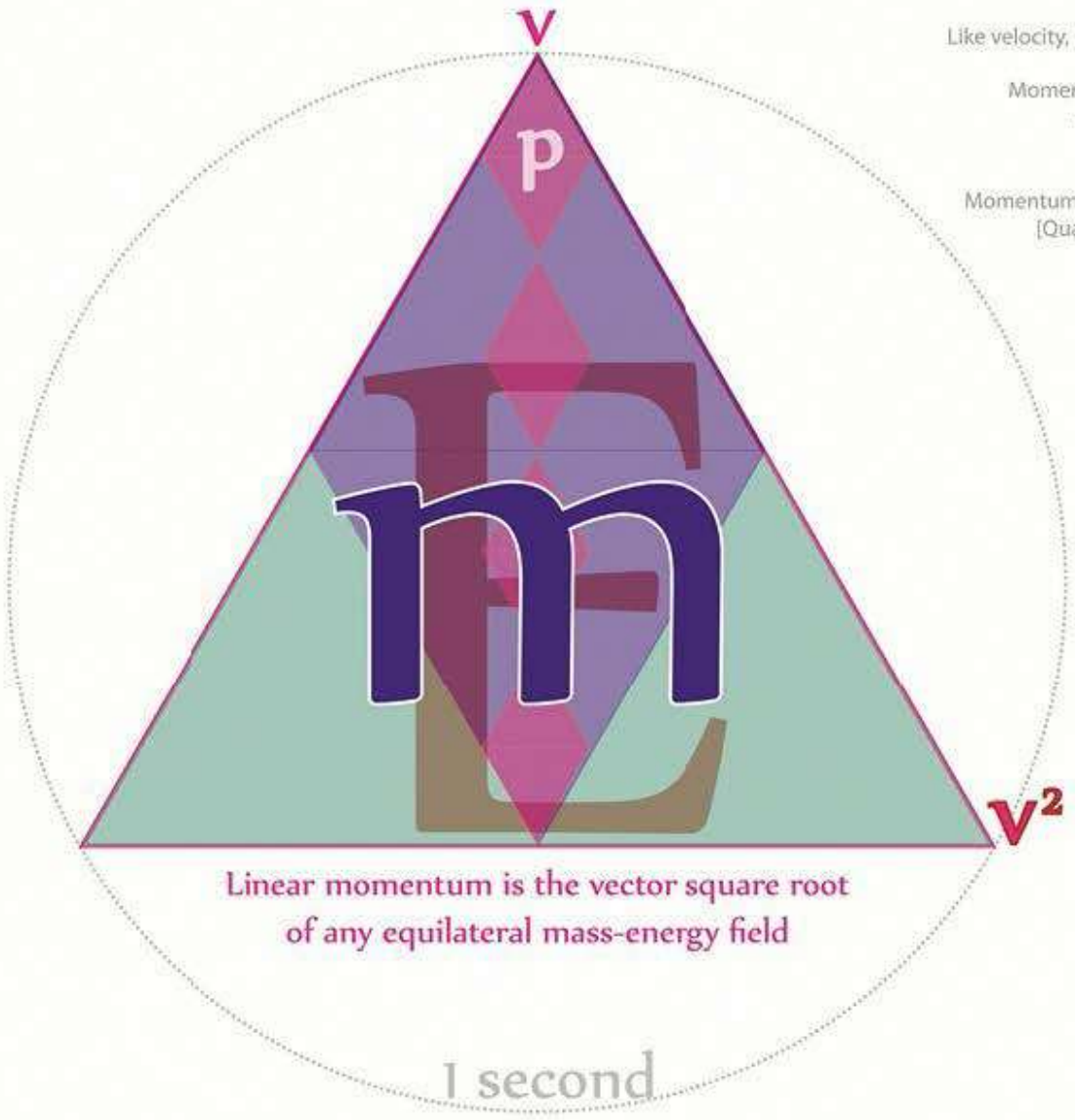
p Momentum $\mathrm{kg}\,\frac{m}{s}$

In classical mechanics, momentum (pl. momenta; SI unit kg·m/s, or, equivalently, N·s) is the product of the mass and velocity of an object (p).

Like velocity, momentum is a vector quantity, possessing a direction as well as a magnitude.

Momentum is a conserved quantity (law of conservation of linear momentum), meaning that if a closed system is not affected by external forces, its total momentum cannot change.

Momentum should be referred to in its specific forms to distinguish it in its various forms [Quantised Angular, Linear, Rotational and quantum/nuclear momentum]



Linear momentum is the vector square root of any equilateral mass-energy field

$$p = \frac{hv^2}{v} = mv$$

Although originally expressed in Newton's Second Law, the conservation of momentum also holds in special relativity and, with appropriate definitions, a (generalized) momentum conservation law holds in electrodynamics, quantum mechanics, quantum field theory, and general relativity.

In relativistic mechanics, non-relativistic momentum is further multiplied by the Lorentz factor.

$$p^2 = E = mv^2$$

Energy can be expressed as the square of linear momentum

$$\mathrm{kg}\,\frac{m^2}{s^2}$$

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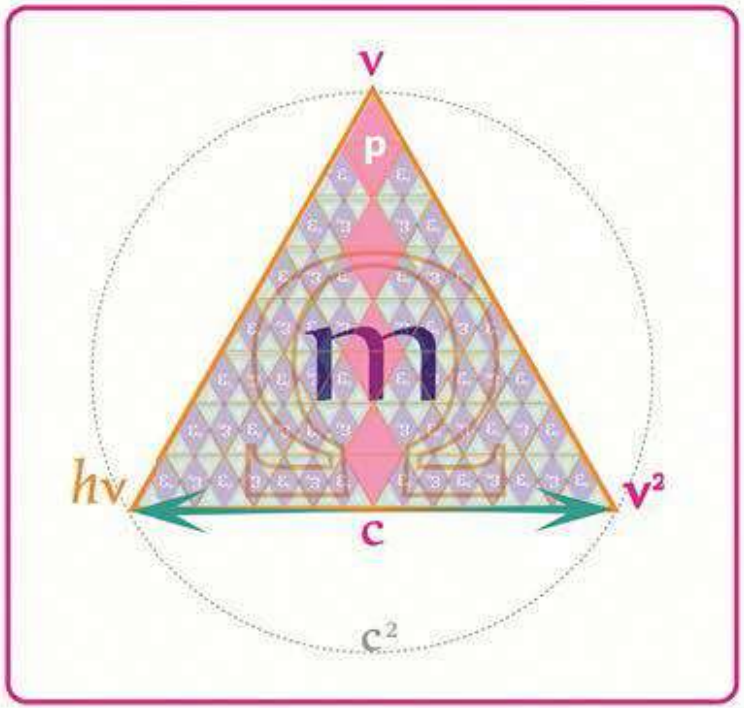
Just as Tetyonic geometry distingushes between angular momenta and linear momentum
it also distingushes between linear momentum and the vector velocities it produces

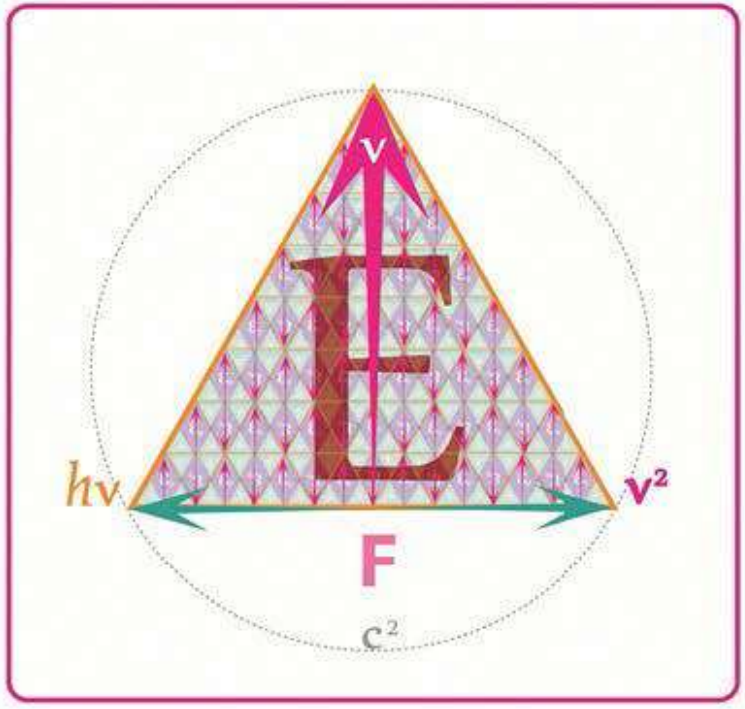
Linear Momentum

$p = mv$

Velocity



$E = pv$



$E = p^2$

SCALAR square root

Scalars are quantities that are fully described by only their magnitude

$E = mv^2$

VECTOR square root

Vectors fully describe both the magnitude and direction.

linear momentum is a scalar component of all equilateral mass-energies that produce vector velocities

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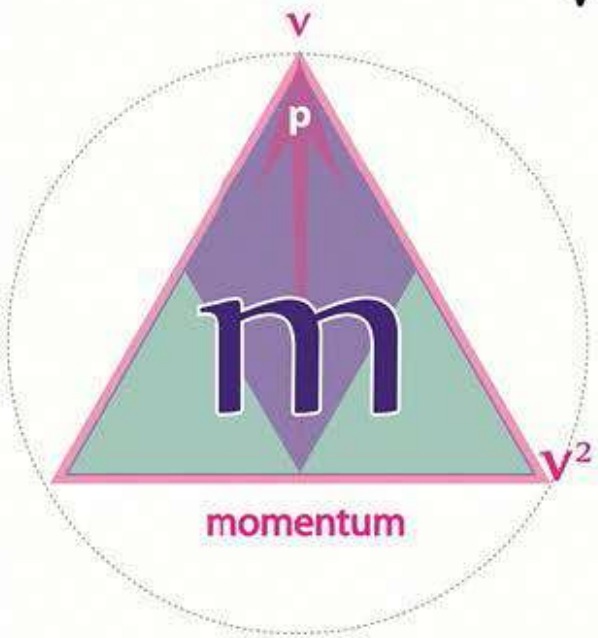
Velocity-Quanta equivalence



Classically, the Energy of massive bodies was determined using the Newtonian mass-velocity relationship

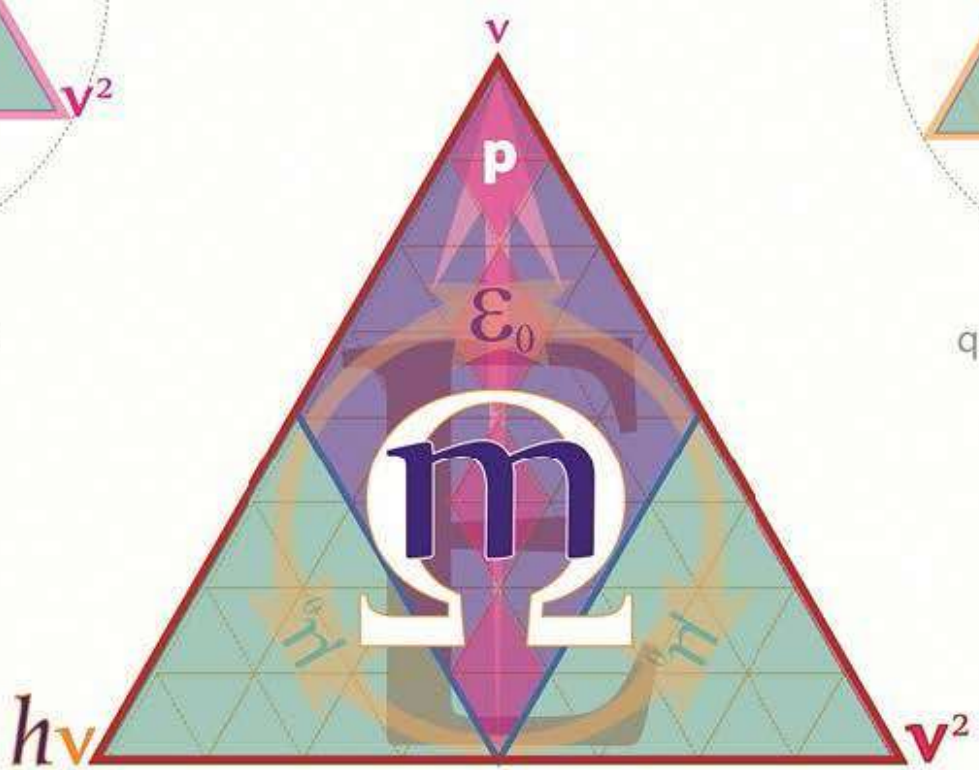
but most recently Quantum mechanics was developed utilising the Planck's quantised Energy relationship

classical vector force

$$mv^2$$

mass
linear velocity
squared

$$kg\left[\frac{m}{s}\right]^2$$



quantised energy momenta

$$hv^2$$

mass
angular momenta
per second

$$kg\left[\frac{m^2}{s}\frac{1}{s}\right]$$

The EM mass-Energy relationship can be revealed either by linear or angular momentum analysis

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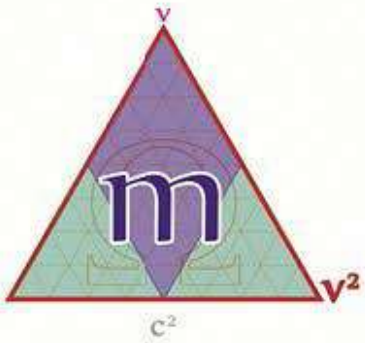
Energy-momentum relationship

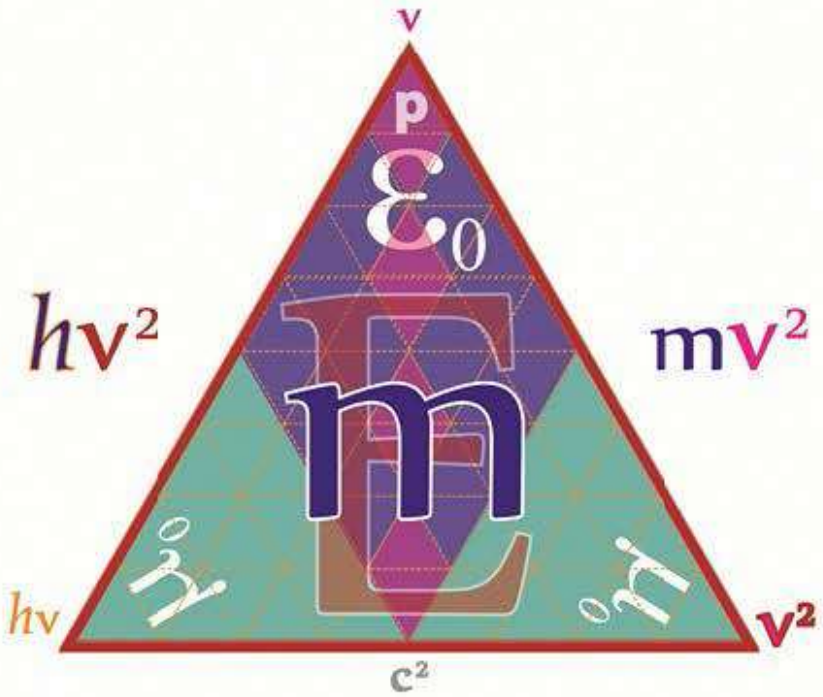
The total number of Planck quanta [mass-angular momenta] in any physical system
is directly related to the square of its linear momentum [mass-velocity]

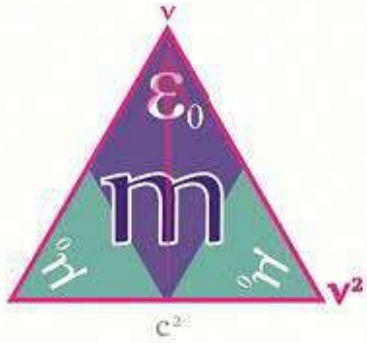
$$h = \frac{E}{v^2}$$

$$m = \frac{E}{v^2}$$



Quantised
Energy-momentum





Linear
Energy-momentum

mass-energy momenta

The omega geometry of Energy produces the direct relationships between Planck's constant-quanta and mass-Energy-momentum of any spatio-temporal co-ordinate system

$$E = m\Omega v^2$$

Quantised Angular Momenta
is an equilateral geometry

$$E = pc$$

Linear momentum
is a vector Force

$$m\Omega v^2 = E = mv^2$$

mass is a derived physical property relating Energy momenta to Velocity

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CHARGE

Charge is a measure of mass.QAM/second
[the equilateral geometry of Energy]
that gives form to all physics

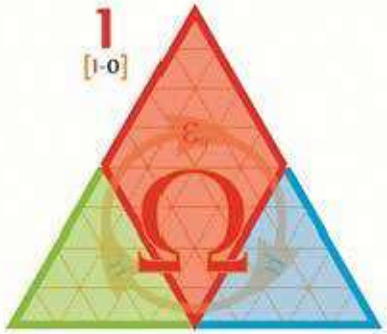
ElectroMagnetic Charge
is a quantum property
resulting from the equilateral
QAM geometry of mass-Energy

The two ElectroMagnetic charge
geometries possible can be modelled
by the flux of electrical energy
in ideal inductive loops

It is a measure of the arrangment of Planck quanta
geometries/topologies within any specific
space-time co-ordinate system

Clockwise inductive
energy flux

q



Positive charged
mass-energy momenta

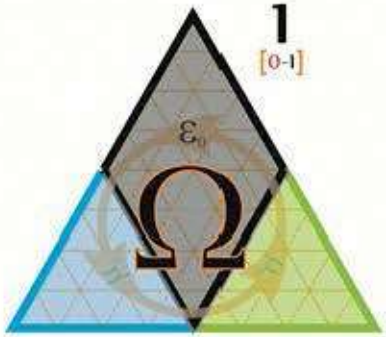
$$\frac{h\nu}{c^2}$$

$$kg\,\frac{m^2}{s}\,\frac{s^2}{m^2}$$

$$kg.s$$

1.33518 e-20 s

Counter clockwise
energy flux



q

Negative charged
mass-energy momenta

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Measuring charge geometries

Charge comes in two types, called Negative and Positive
which create the Law of Interaction (historically, the Law of Attraction)

q

quantised Charge

[v] [v]

Q

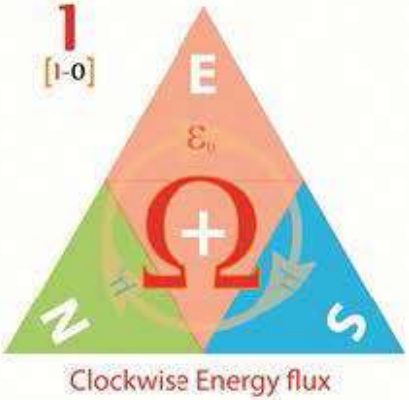
nett Charge

[v–v]

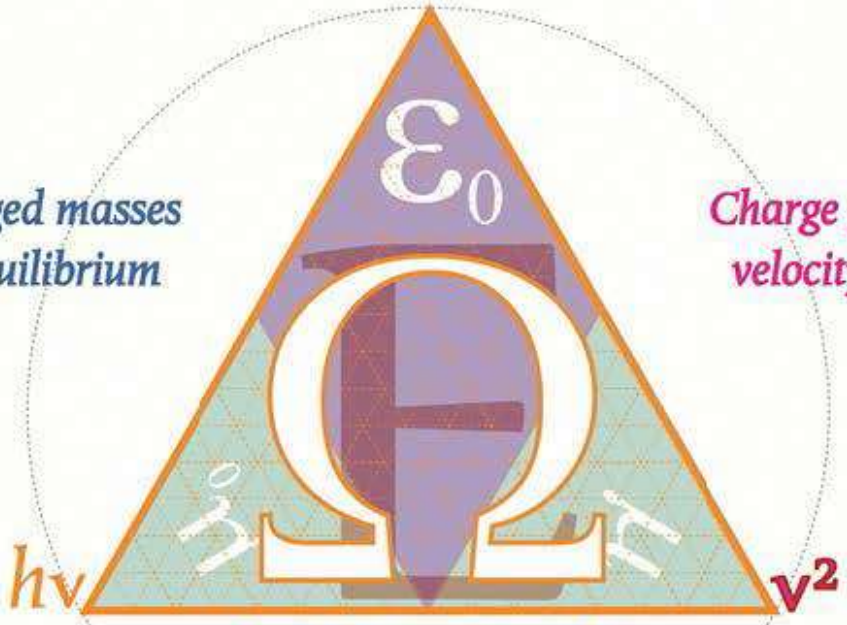
[v–v]

All charged masses seek equilibrium

Charge geometry is velocity invariant



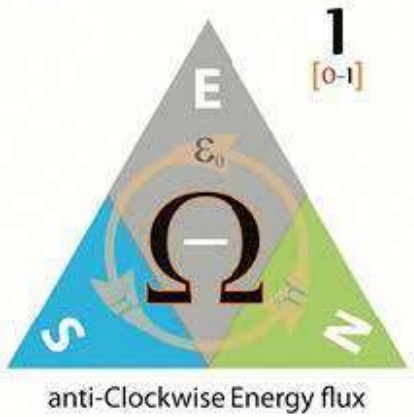
Clockwise Energy flux



Charge is the geometric source of all

EM forces

$\frac{c^2}{sec}$



anti-Clockwise Energy flux

Historically defined as a physical property of mass-Matter that causes it to experience a force
charge is actually the result of the equilateral geometry of qantised mass angular momenta
which provides the physical mechanics of mass-ENERGY-Matter differentiation and interaction

The SI unit of quantity of charge is the Coulomb, **C ≈ mass seconds ≈ kg.s** which can also be expressed as Amp-seconds

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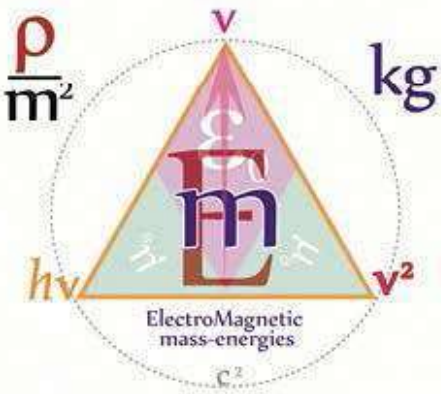
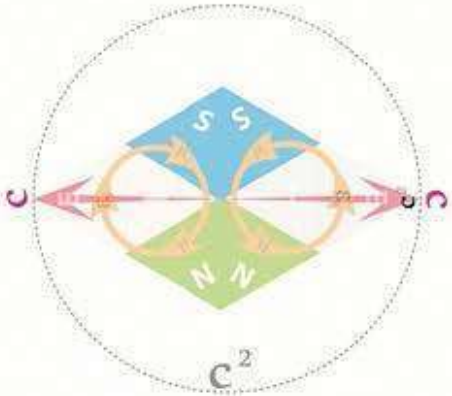
EM Field Geometry

mass-energies are 2D
radiant EM field
geometries

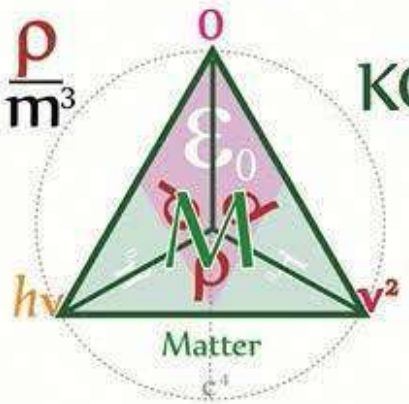


[299,792,458 m/s]
'c' forms a CONSTANT of proportionality
for different spatio-temporal co-ordinate systems
used to measure mass-ENERGY-Matter

All Matter are 3D
EM standing wave
topologies



EM fields create
'interaction-at-a-distance'



Electrostatic Matter has
opposing 2D KEM fields

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Energy quantisation

All mass-Energy-Matter can only have certain integer Energy-momenta,
[mass-Energy in all its forms is QUANTISED]

q

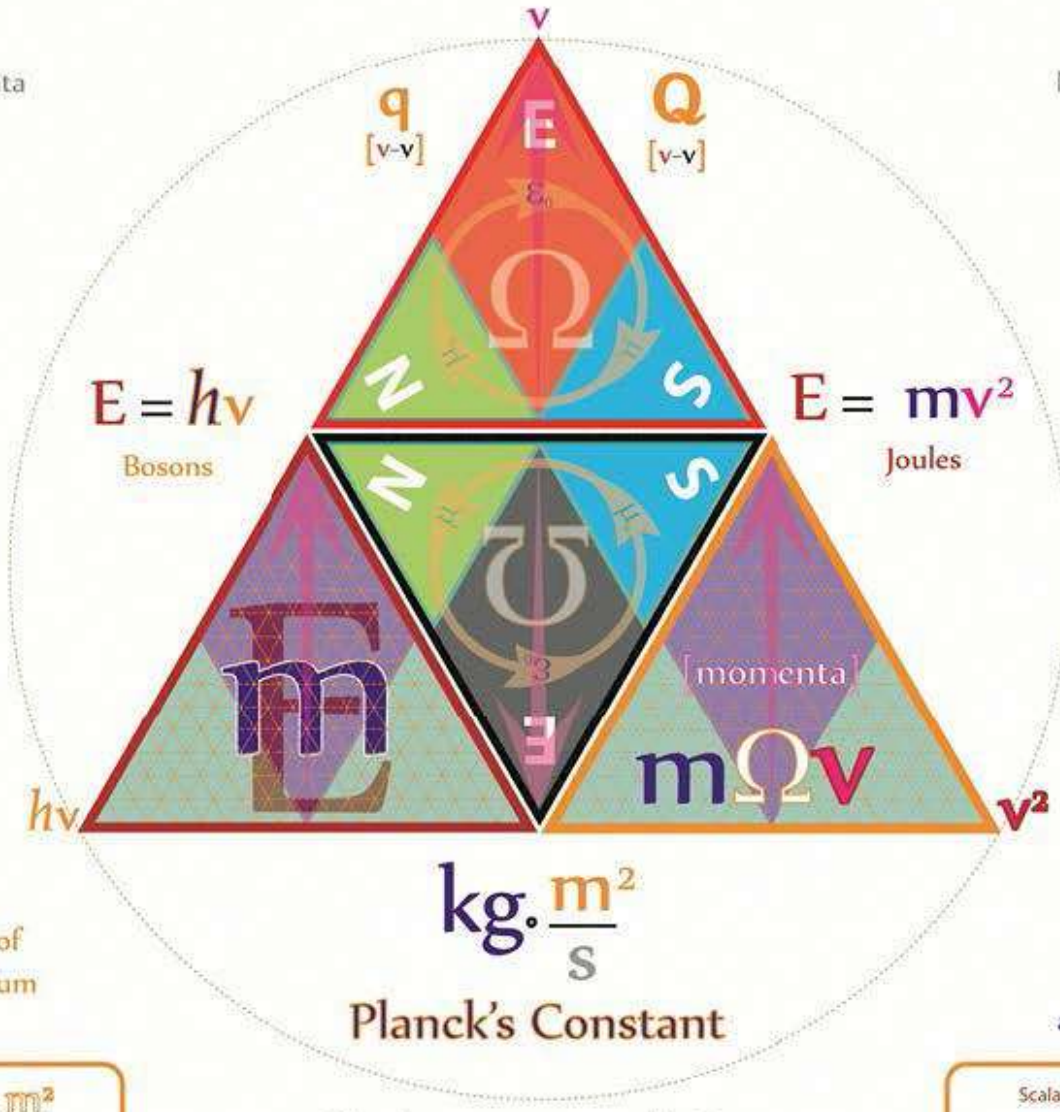
Net quanitised angular momenta
[inductive energy flux]
determines Charge

$m\left[\frac{\Omega}{c^2}\right]$

$kg\,\frac{m^2}{s}.\frac{s^2}{m^2}$

seconds

Transverse quanta
create Quantum Levels



$kg.\frac{m^2}{s}$

Planck's Constant

n.Planck quanta per second is Energy

q

Net quanitised angular momenta
[inductive energy flux]
determines Charge

$m\left[\frac{\Omega}{c^2}\right]$

$kg\,\frac{m^2}{s}.\frac{s^2}{m^2}$

seconds

Scalar (nett) quanta
create Square Energies

The equilateral geometry of
quantised angular momentum
creates charged masses

Planck's Constant is in fact
mass x equilateral QAM

$kg.\frac{m^2}{s}$

Planck's Constant
can be described in
a number of differing ways

Scalar Energy x Time $kg.\frac{m^2}{s^2}.s$

Linear momentum x Distance $kg.\frac{m}{s}.m$

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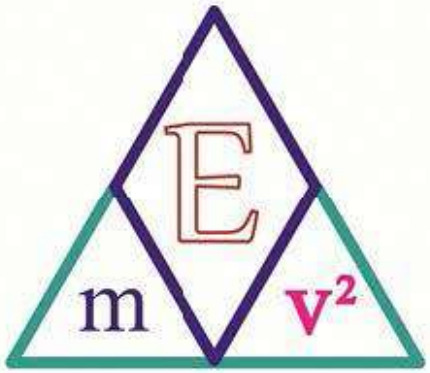
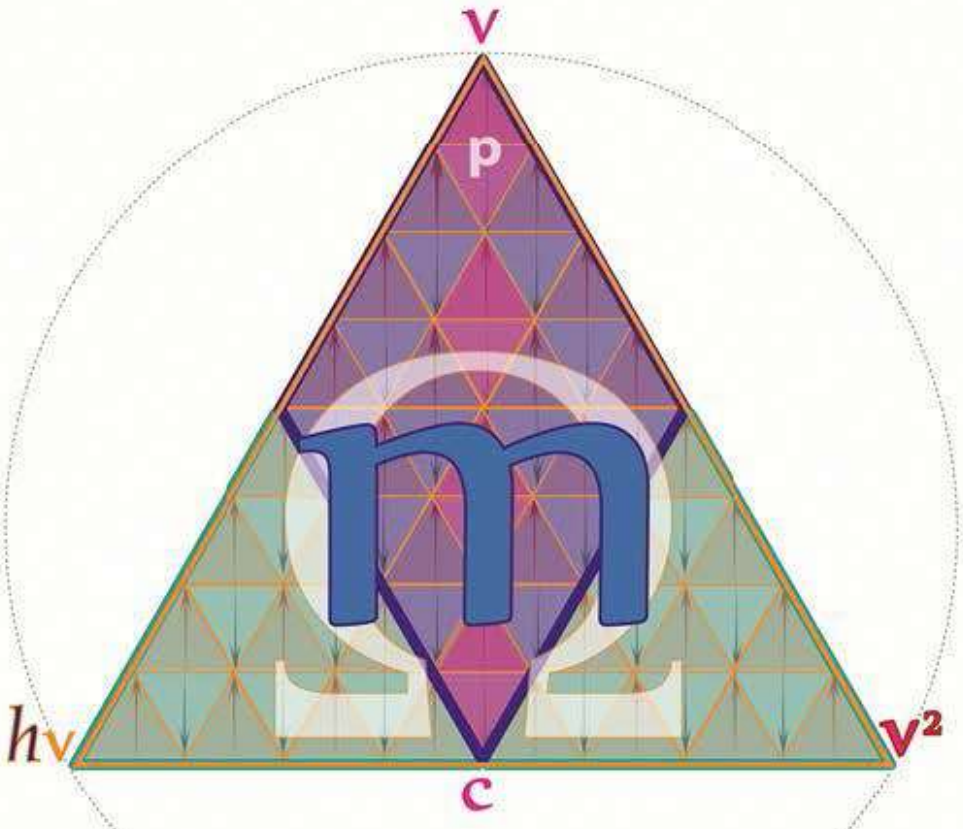
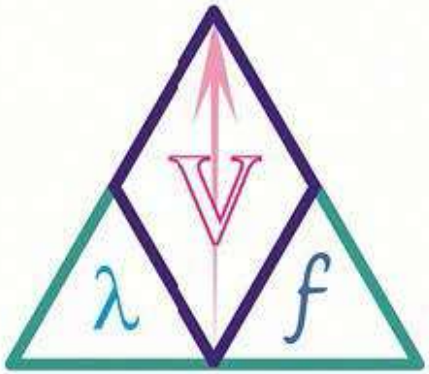
Tetryonic Mnemonics



Energy momentum

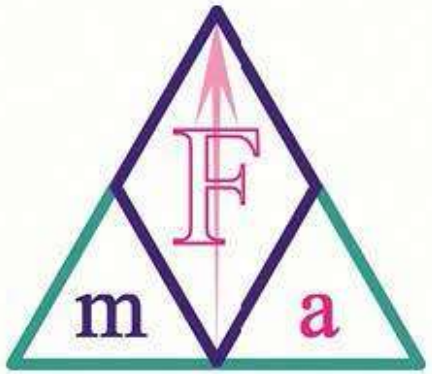


Electrical flow



velocity of propagation

Many physical relationships are can be represented with DELTA mnemonics



Inertial Force

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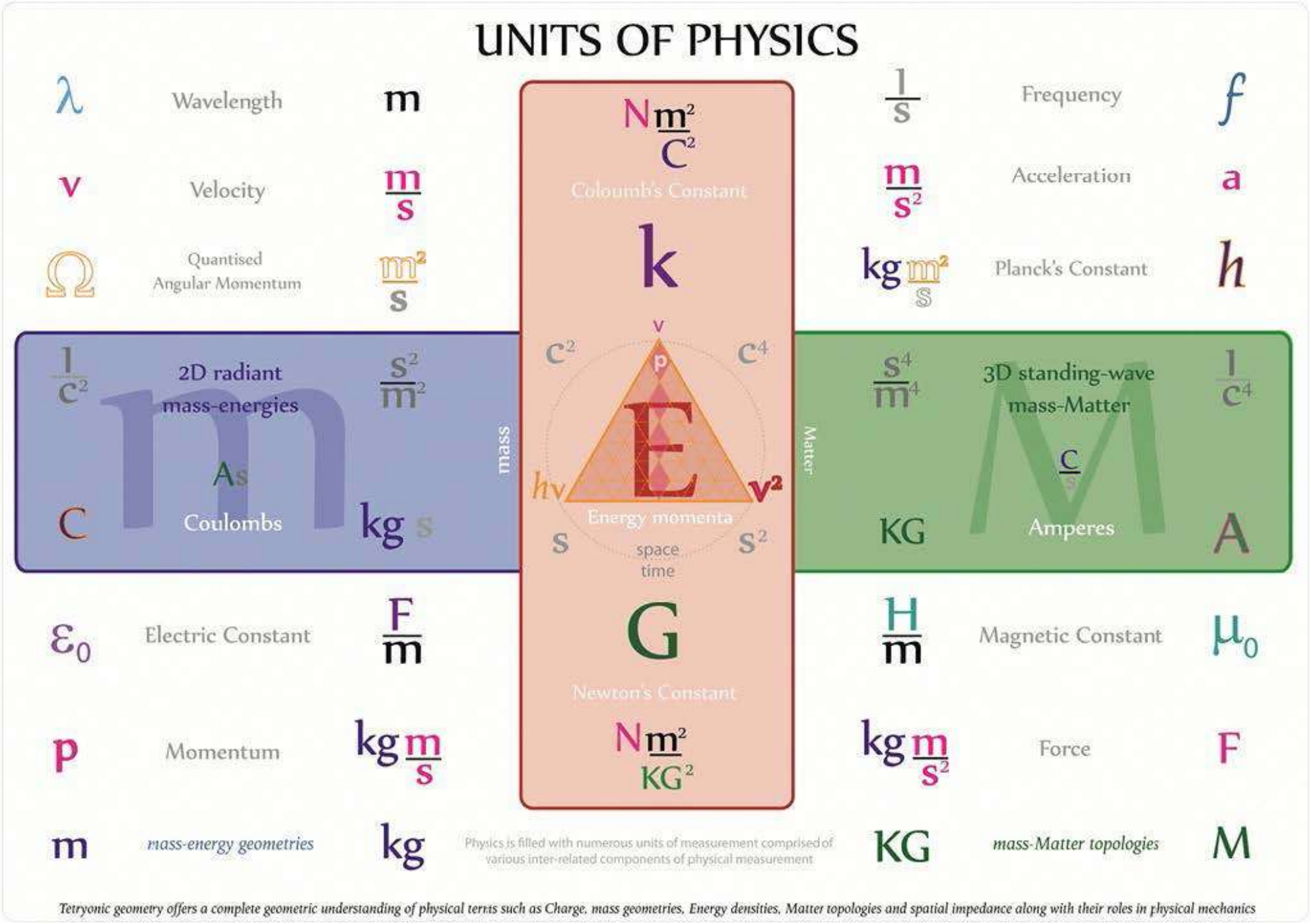

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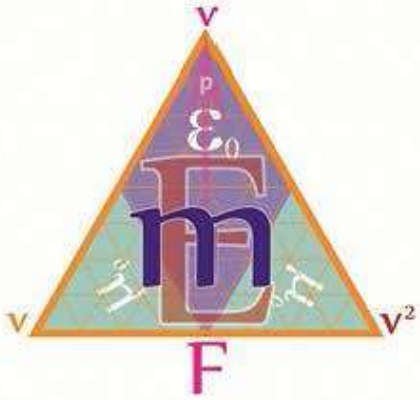
Scalar mass-energies

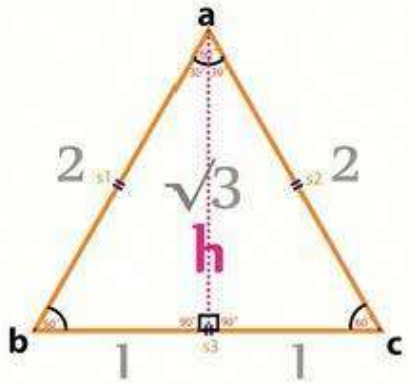
have an EQUILATERAL geometry
(60°- 60°- 60°)

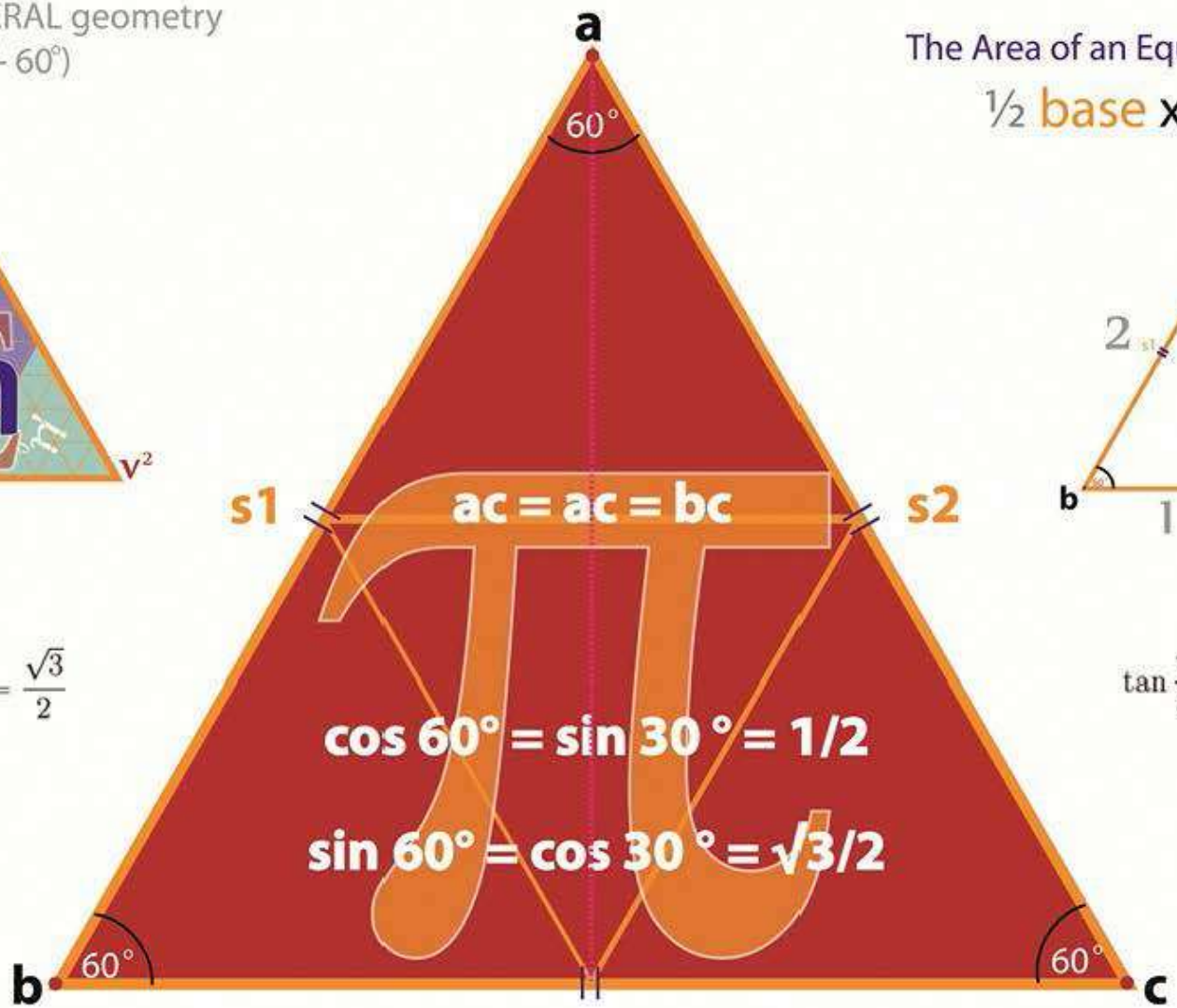
$\frac{\sqrt{3}}{2}$ s

The Area of an Equilateral triangle

½ base x height







$$\sin\frac{\pi}{3} = \sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\tan\frac{\pi}{3} = \tan 60^\circ = \sqrt{3}$$

$$\cos\frac{\pi}{3} = \cos 60^\circ = \frac{1}{2}$$

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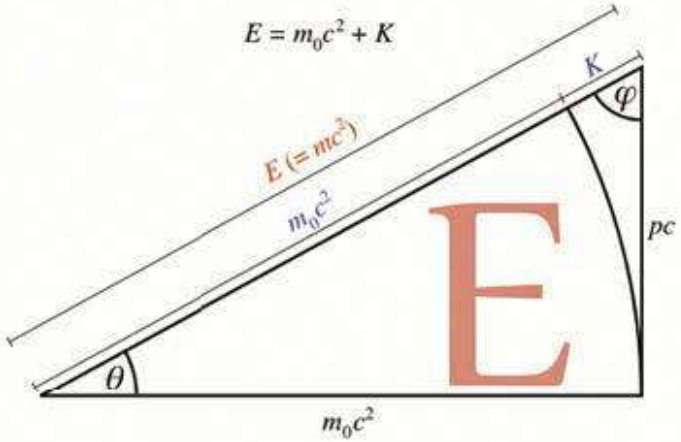
Pythagorian geometry

Energy geometries within Physics including Special Relativity and Lorentz corrections have historically been incorrectly illustrated as having the geometry of right angled triangles



$$E^2 = p^2c^2 + m_0^2c^4$$

Generalizing, we see that the square of the total mass-energies is the sum of the components squared.
[shown incrorectly formulated in this above equation]

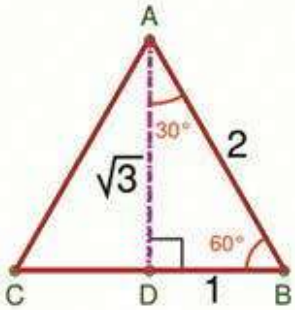
We can see an origin of distance in spacetime relating to velocity in pc in which Energy is subject to Lorentz corrections (v/c)

$$E = pc.$$

Additionally, EM mass can be directly related to the energy content of a body by the velocity of Energy

$$E = mc^2$$

Physics is geometry,
one cannot be separated from the other



$$mv^2 = E = hv^2$$

There are three ways to look at geometry
– mathematically, verbally, and visually,

Of the three, Visually will be shown to be superior leading to intuitive understandings of Physics, Chemistry, Electrodynamics and Gravitation along with all their related physical attributes

6.629432672 e-34 J

Planck quanta

$$[m\Omega v]^2$$

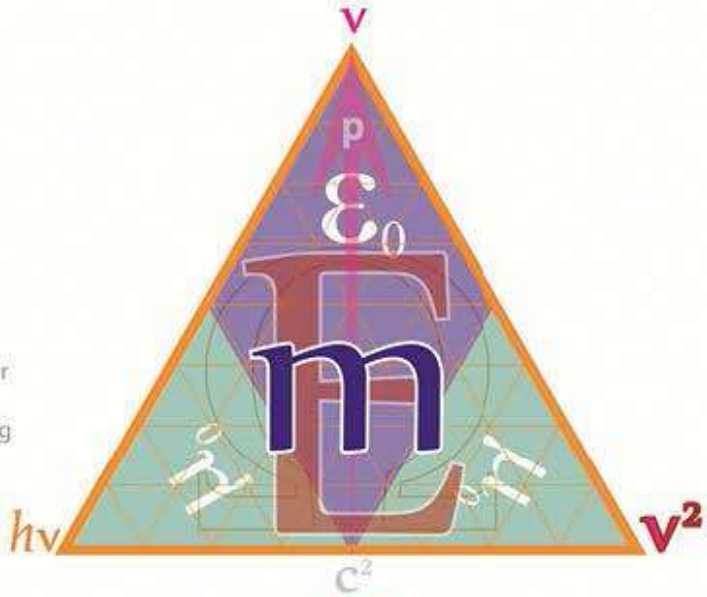
mass velocity

7.376238634 e-51 kg

$$mv = p$$

Tetryonic geometry

The source of all the physical relationships of mass-Energy momenta & their constants is the geometry of equilateral Planck Triangles (and all texts must be corrected)



F

$$\sum \mathbf{F} = \frac{d\mathbf{P}}{dt} = m\frac{d\mathbf{v}}{dt} = m\mathbf{a}$$

Newton's Second law of Motion
is based on changes to linear momentum

$$\mathbf{F} = m\mathbf{a}\,.$$

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Tetryonics and Pi radians

Although not historically considered a physical constant, π appears routinely in equations describing fundamental principles of the Universe, due in no small part to its relationship to the nature of the circle and, correspondingly, spherical coordinate systems.

The quantised equilateral geometry of mass-energy momenta is measured in π radians

Using units such as Planck units can sometimes eliminate π from formulae.

Heisenberg's uncertainty principle, which shows that the uncertainty in the measurement of a particle's position (Δx) and momentum (Δp) can not both be arbitrarily small at the same time:

$$\Delta x \, \Delta p \geq \frac{h}{4\pi} = \frac{\hbar}{2}$$

Einstein's field equation of general relativity:

$$R_{ik} - \frac{g_{ik}R}{2} + \Lambda g_{ik} = \frac{8\pi G}{c^4} T_{ik}$$

The cosmological constant Λ from Einstein's field equation is related to the intrinsic energy density of the vacuum ρvac via the gravitational constant G as follows:

$$\Lambda = 8\pi G \ \rho_{vac}$$

Coulomb's law for the electric force, describing the force between two electric charges (q1 and q2) separated by distance r:

$$F = \frac{|q_1 q_2|}{4\pi\varepsilon_0 r^2}$$

Magnetic permeability of free space relates the production of a magnetic field in a vacuum by an electric current in units of Newtons (N) and Amperes (A):

$$\mu_0 = 4\pi \cdot 10^{-7} \, \mathrm{N/A^2}$$

Kepler's third law constant, relating the orbital period (P) and the semimajor axis (a) to the masses (M and m) of two co-orbiting bodies:

$$(\frac{2\pi}{P})^2 a^3 = \omega^2 a^3 = G(M+m)$$

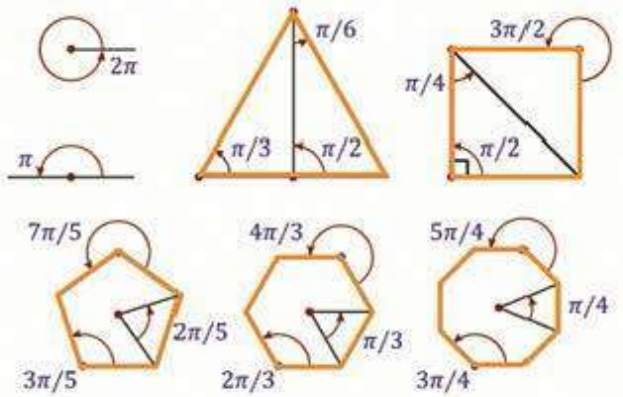
and the Gaussian formula for a Normal Distribution:

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-(x-\mu)^2/(2\sigma^2)}$$

$$\pi = \frac{C}{d}.$$

n π radians

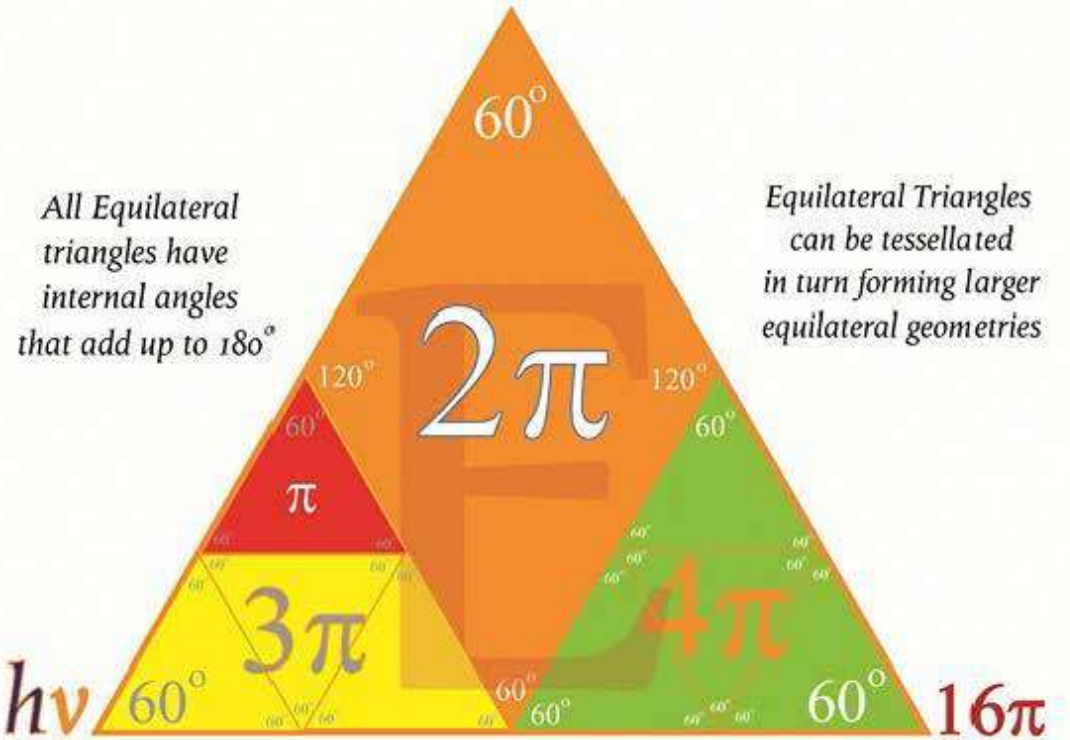
$$\pi = \frac{A}{r^2}.$$



Pi radian mass-energy fascia geometries

All Equilateral triangles have internal angles that add up to 180°

Equilateral Triangles can be tessellated in turn forming larger equilateral geometries



SQUARED numbers in physics are EQUILATERAL geometries

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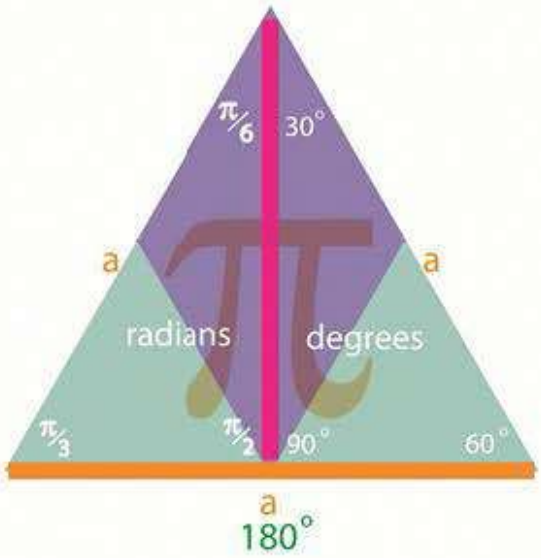
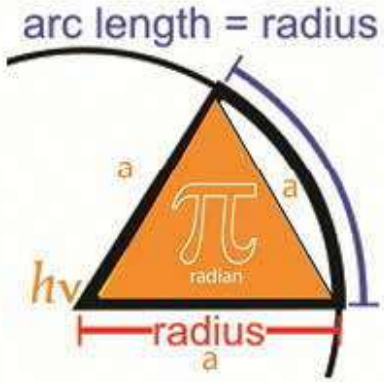
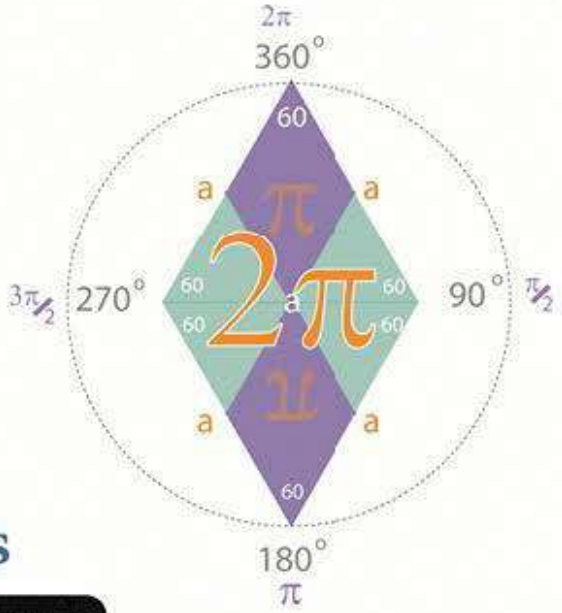
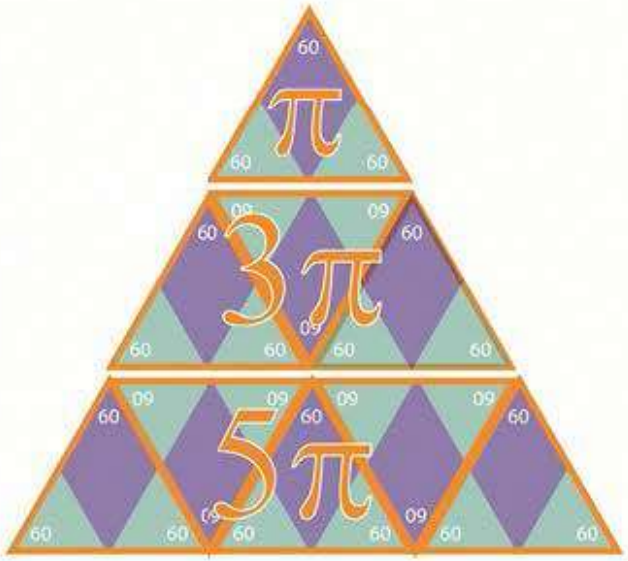






nπ mass-energy geometries

180° π An equilateral triangle of mass-energy momenta has a geometry of π radians 2π 360°



2π
a
5π/3
π/3
a
a
09
09
09
09
360°
09
09
09
09

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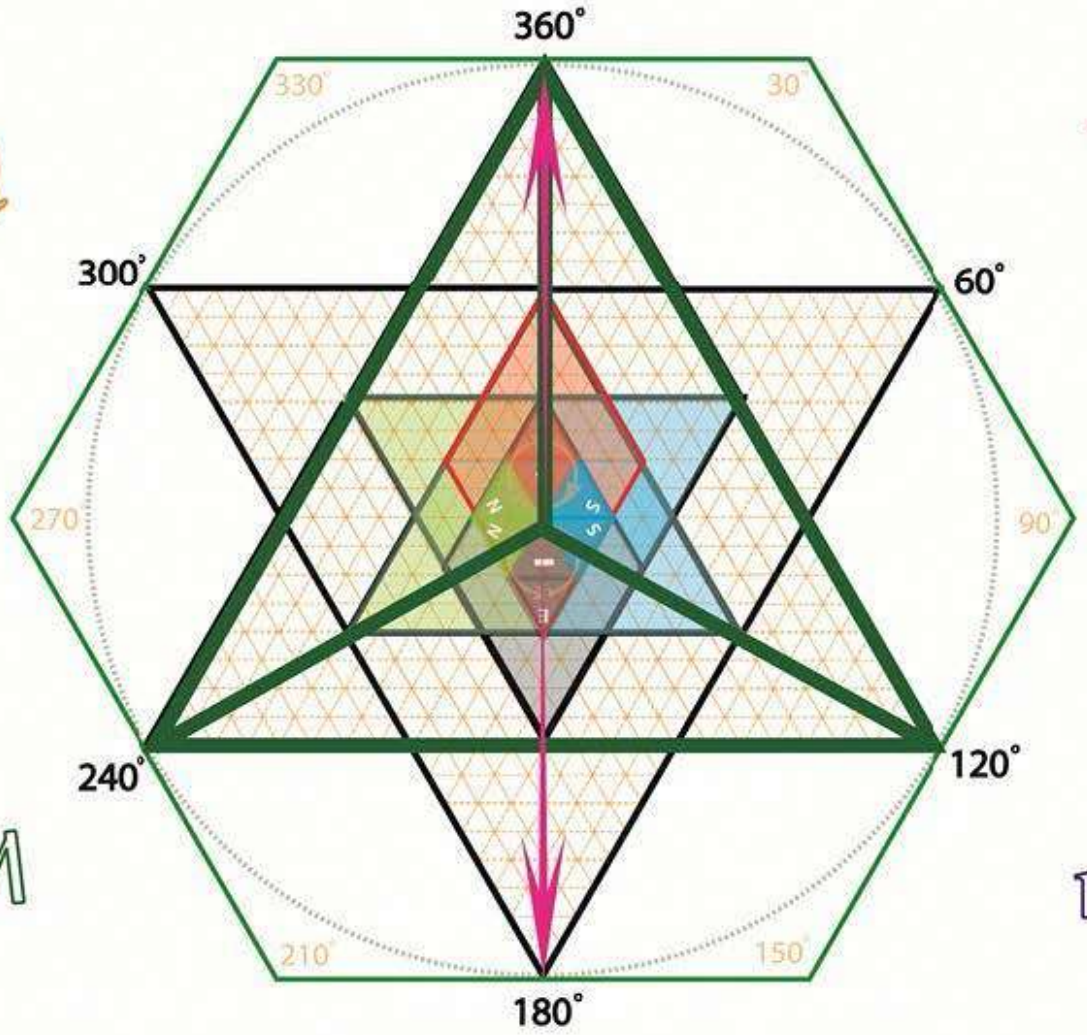
Tetryonic Cardinal Angles

equilateral mass-energy geometries form tetrahedral mass-Matter topologies



EM Charge

Q

Equilateral energies

E

Space

Time

M

m

Matter topologies

radiant light

mass geometries

in radial spatial co-ordinate systems defined by the speed of light

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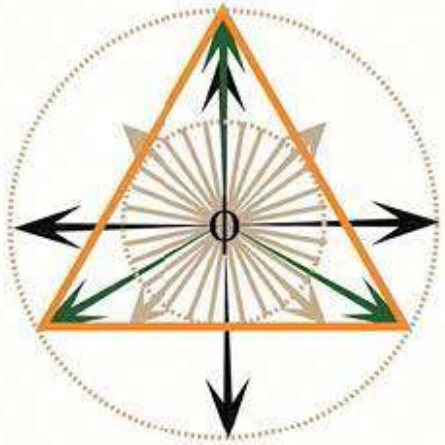
Charge
$ODD\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$
Bosons & quantum levels
EM Field: ElectroMagnetic
Planck quanta: mass, velocity

Kinetic Energies
$EVEN\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$
Photons & EM waves
EM Field: ElectroMagnetic
Planck quanta: mass, velocity

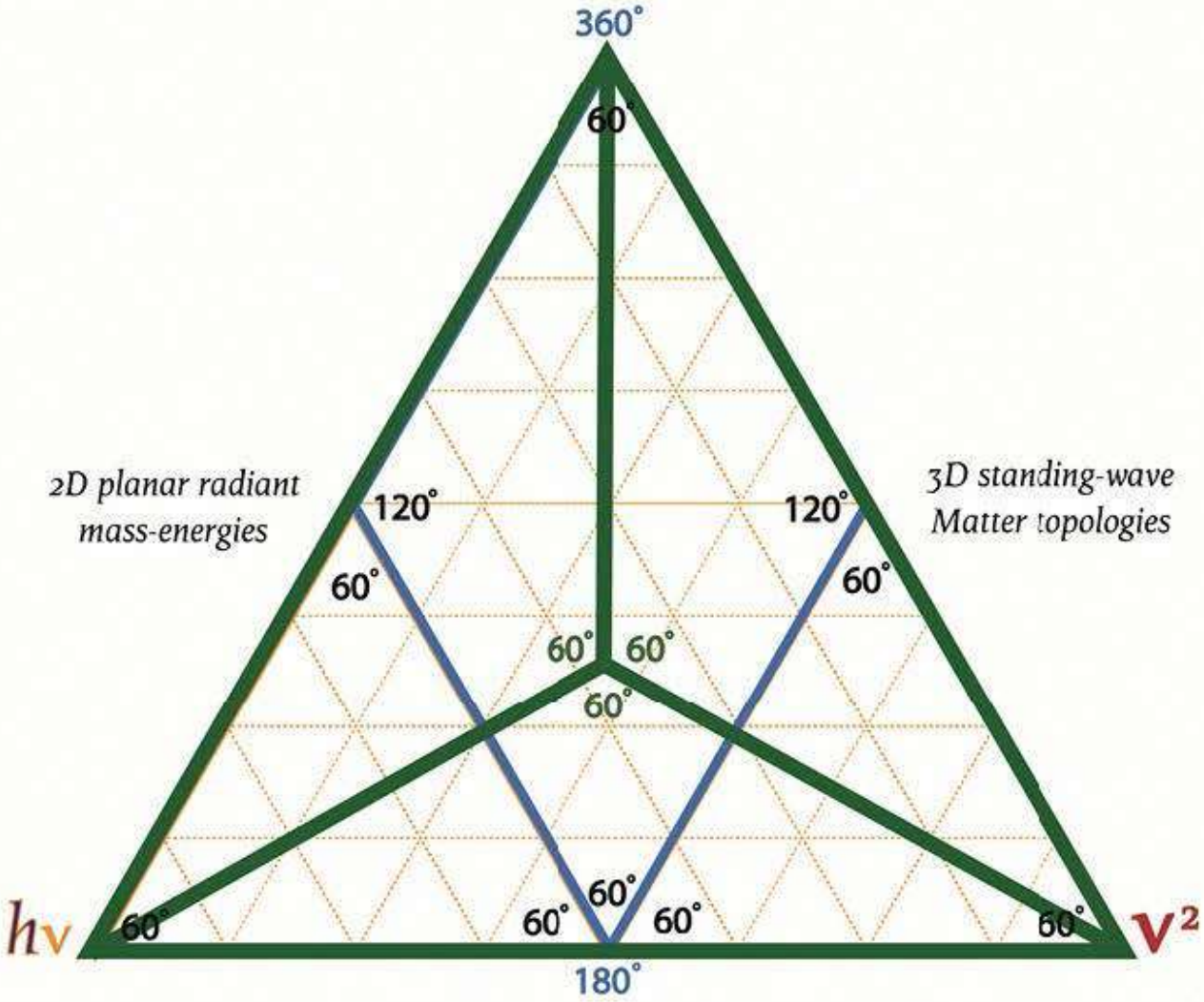


ALL Matter topologies stem from tessellated equilateral mass-energies

Matter
$4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$
Fermions
EM Field: ElectroMagnetic
Planck quanta: mass, velocity

Matter's 4π mass-Energies
ares Lorentz invariant to accelerations

mass-energy geometries



Matter topologies

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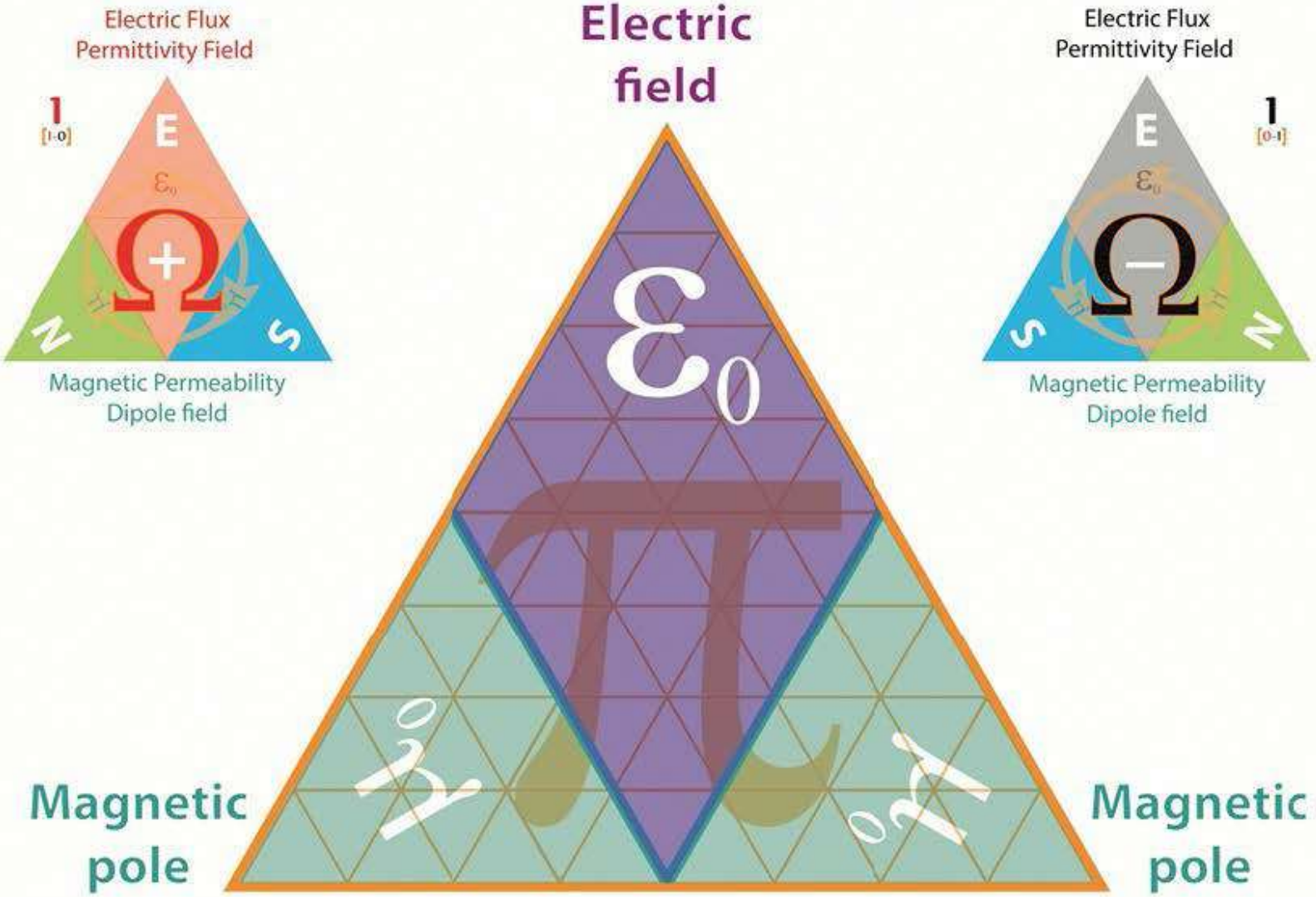
Tetryonic geometry



equilateral quantised angular momenta
is the foundational geometry of all mass-ENERGY-Matter

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The Golden Triangle

Planck's formulation for Energy is imprecise for use in Tetryonics
and does not reflect the velocity-momenta relationship
inherent in the equilateral geometry of Energy

Planck quantum levels

Energy is gained or lost in
whole number multiples of the quantity hv

$$E = n[hv]$$

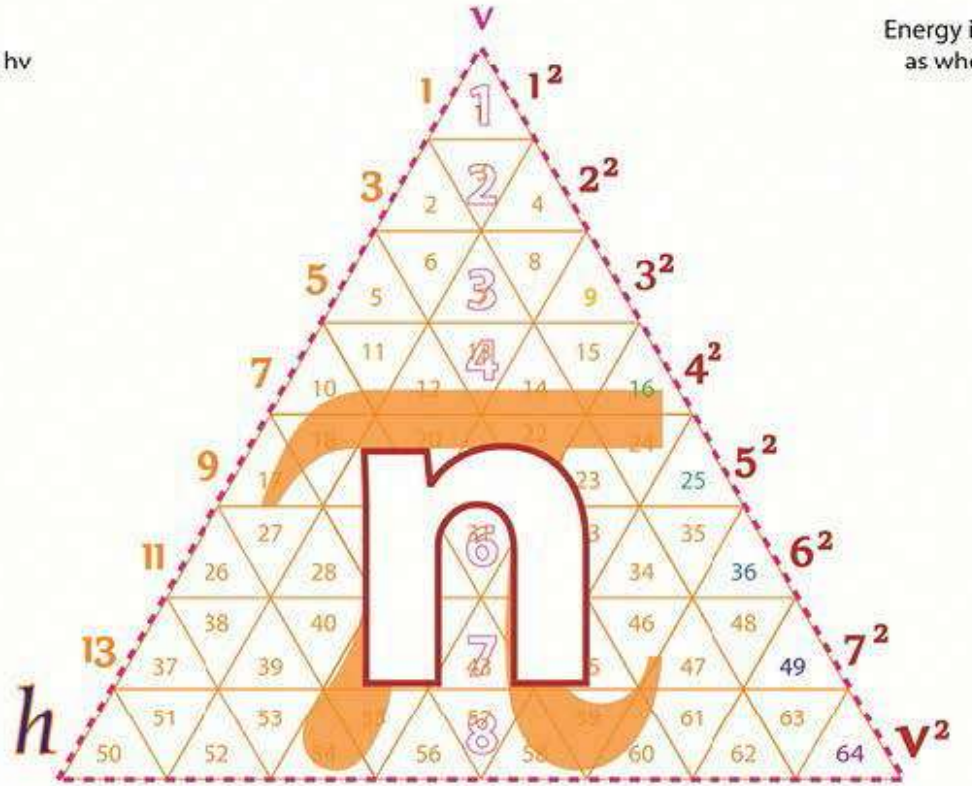
ODD

Charge — EM Field — Planck quanta
$$ODD\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$
Bosons & quantum levels — ElectroMagnetic — mass — velocity

$$3 = 3.[1]$$
$$9 = 9.[1]$$
$$25 = 25.[1]$$

$$hv$$

The generalise formulation of Plank's heat law
E = nhv is now changed to a specific formulation of
E = [ODD] hv for transverse quantum levels [Bosons]



mass-energy momenta are geometrically related to velocity

Tetryonic geometry [nπ] redefines Planck's quantum formulation for heat energies from a generalised equation for 2D energy momenta into a geometric formulation for all mass-energy momenta in Matter

[all equilateral [π] geometries contain square number quanta]

Scalar energy quanta

Energy is gained or lost in equilateral geometries
as whole number multiples of the quantity hv²

$$E = n[hv]$$

SQUARED

Planck quanta
$$E = n\pi\left[\left[m\Omega v^2\right]\right]$$
mass — velocity

$$3 = 3.[1^2]$$
$$9 = 1.[3^2]$$
$$25 = 1.[5^2]$$

$$hv^2$$

The general formulation of Plank's heat law
is also changed to a specific formulation of
E = hv² for scalar EM waveforms [ENERGY]

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Scalar field geometries

All scalar fields are comprised of Transverse and Longitudinal mass-energy momenta all of which are formed from equilateral quantum geometries

Charge is a conserved force

Energy is a conserved quantity

Bosons are transverse
ODD planck geometries

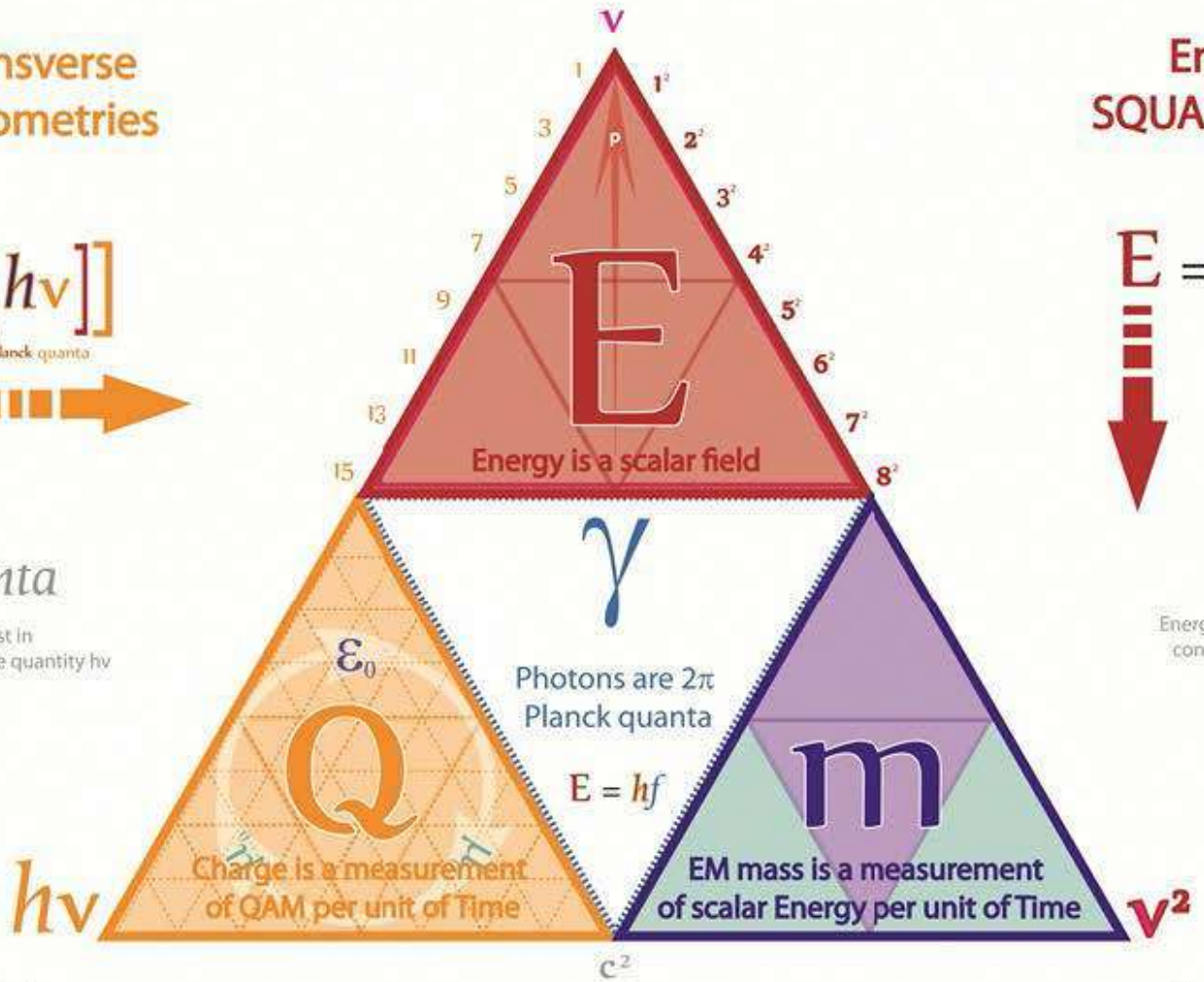
$$E = n\pi[[h\nu]]$$

Planck quanta

Energy is scalar
SQUARE planck quanta

$$E = n\pi[[h\nu^2]]$$

Planck quanta squared



Planck quanta

Energy is gained or lost in
whole number multiples of the quantity hν

Scalar energies

Energy is gained or lost in equilateral quanta
containing whole number multiples of hν²

All energy is comprised of
EM fields

All squared energy geometries
have component quantum levels

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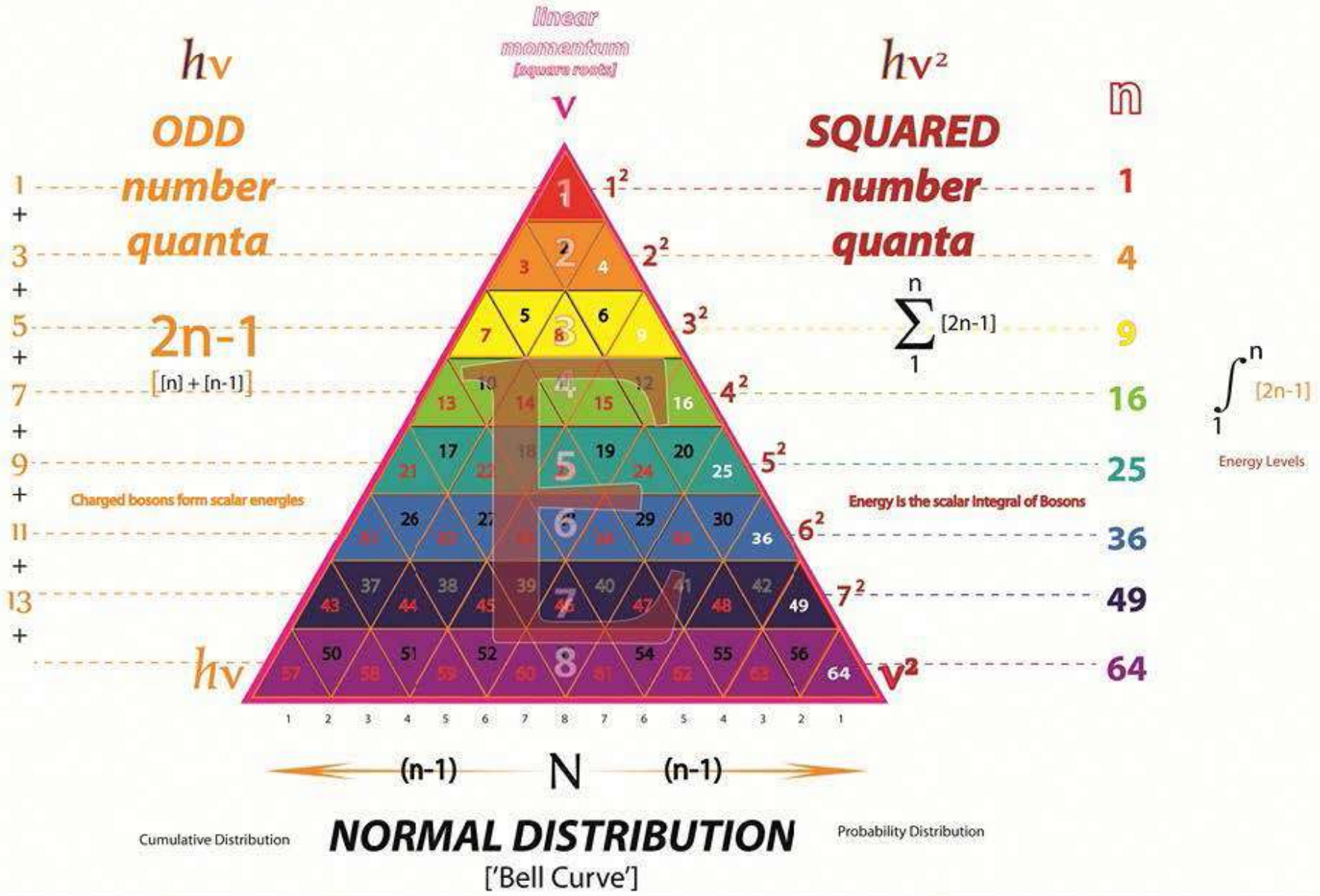
Squared energy levels in quantum physics

are in fact equilateral Planck mass-energy geometries



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Energy quanta defined

Quantum levels

Charge is gained or lost in
odd number multiples of the quantity hv

$$E = n\pi[[hv]]$$

Planck quanta

transverse

ODD quanta

Scalar Energies

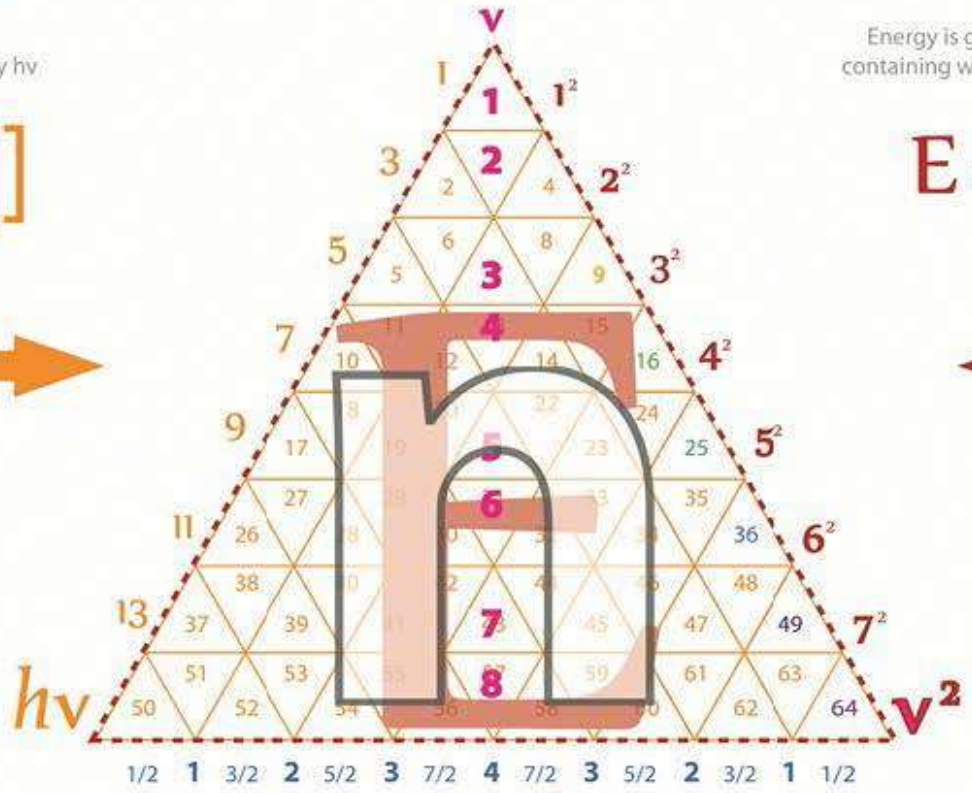
Energy is gained or lost in equilateral geometries
containing whole number multiples of the quantity hv^2

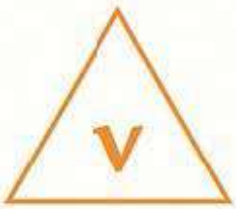
$$E = n\pi[[hv^2]]$$

Planck quanta squared

scalar

SQUARE quanta





Quantum

The number of Planck quanta
in any physical system

$$v = f/2$$

Transverse

Quantum Levels

The number of
repeating waveform cycles
in a system

$$2v = f$$

Frequency

EVEN quanta

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Tetryonic field equation

E

$$E = n\pi\left[\left[m\Omega v^2\right]\right]$$

electromagnetic energy is a scalar

$$E$$

m

$$n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

mass is an inertial constant
that relates Force to acceleration

$$\frac{E}{c^2}$$

[v-v]
Q

$$ODD\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

equilateral charge geometry
is Lorentz invariant

$$\frac{\Omega}{c^2}$$

KE

$$EVEN\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

KEM fields mass-energy geometries
are Lorentz variant to accelerations

$$\frac{1}{2}m\left[\frac{v^2}{c^2}\right]$$

M

$$4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Matter's 4π mass-energy topologies
are Lorentz invariant to accelerations

$$4n\pi\left[\frac{E}{c^4}\right]$$

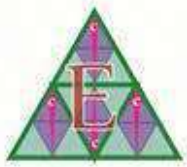
Energy momenta geometry

Energy is the total Planck quanta per second

EM mass is scalar energy per unit of Time

Charge is the nett Angular momentum per spatial co-ordinate system

Kinetic Energy is the Electric field
mass-energy of Matter moving at v



mass-energy geometry

Matter topology

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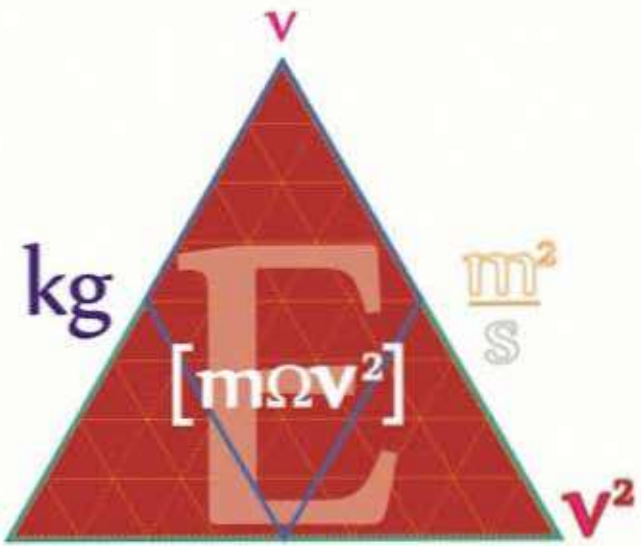
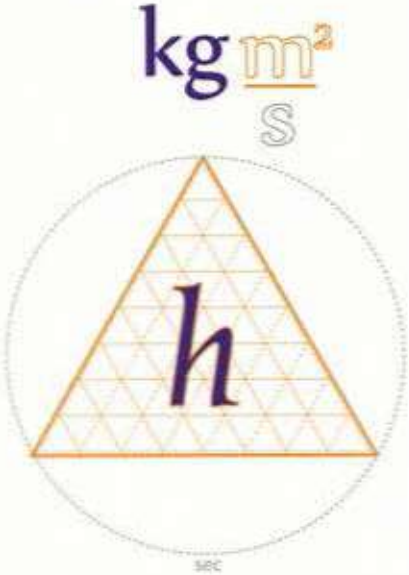
mass-Energy equivalence





$$m = \frac{E}{v^2}$$

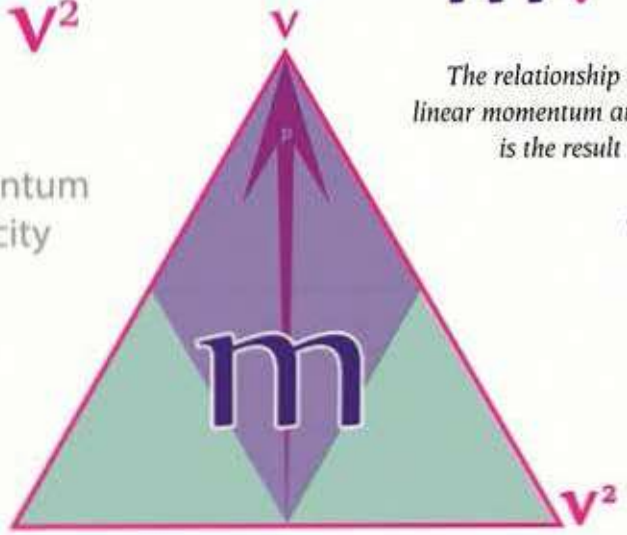
$$mv^2 = hv^2$$

$$h = \frac{E}{v^2}$$

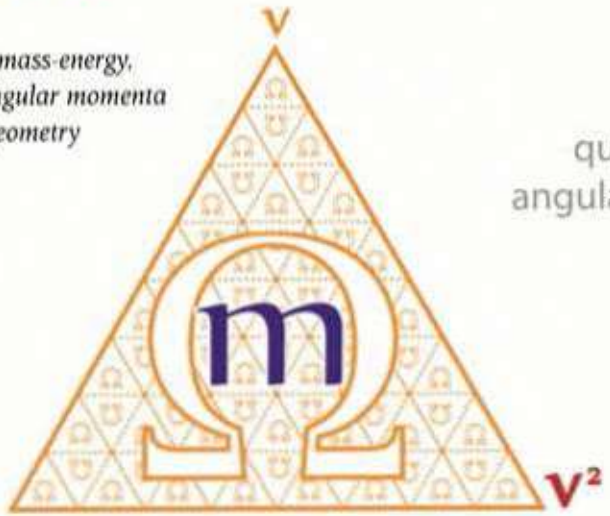
linear momentum
mass velocity

The relationship between scalar mass-energy, linear momentum and quantised angular momenta is the result of equilateral geometry

quantised
angular momenta



kg



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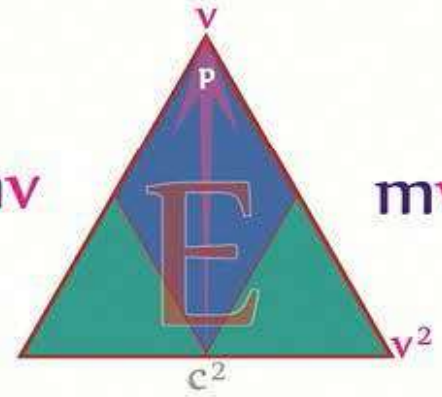
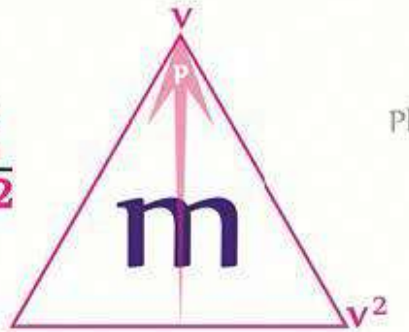
mass-Energy geometries

Leibniz - Newton | **Planck - Einstein**

$p=mv$ | $mv^2 = E$



EM mass | Energy

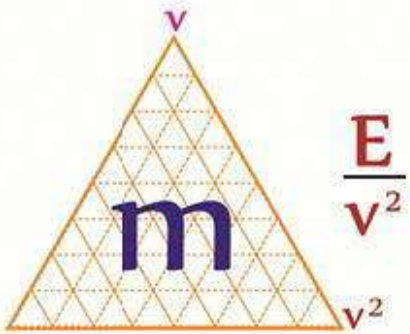


$m=\frac{E}{v^2}$

h

Planck's Constant

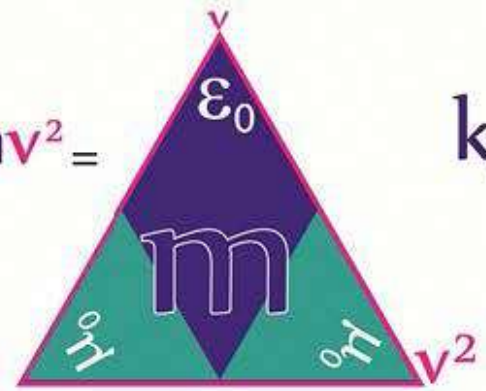
$kg\,\frac{m^2}{s}$



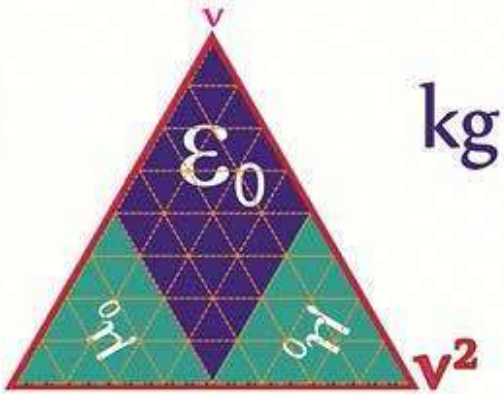
$\frac{E}{v^2} = h$

velocity | quanta

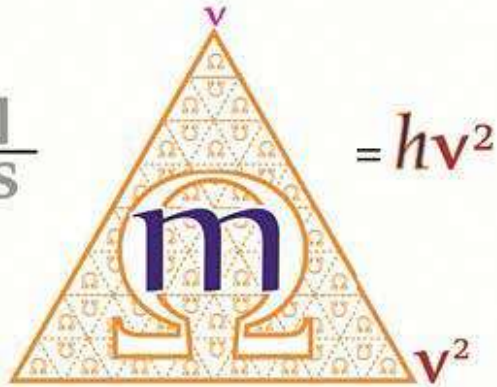
$mv^2 =$



$kg\,\frac{m^2}{s^2}$



$kg\,\frac{m^2}{s}\,\frac{1}{s}$



$= hv^2$

velocity squared

There exists an intrinsic geometric relationship between mass-velocity and the quantisation of Energy momenta

quanta squared

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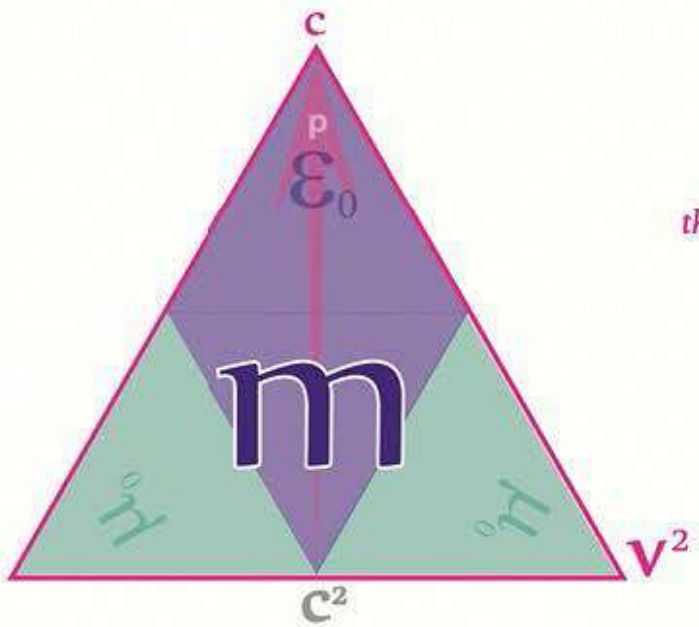
EM mass-energy

$$E = mc^2$$

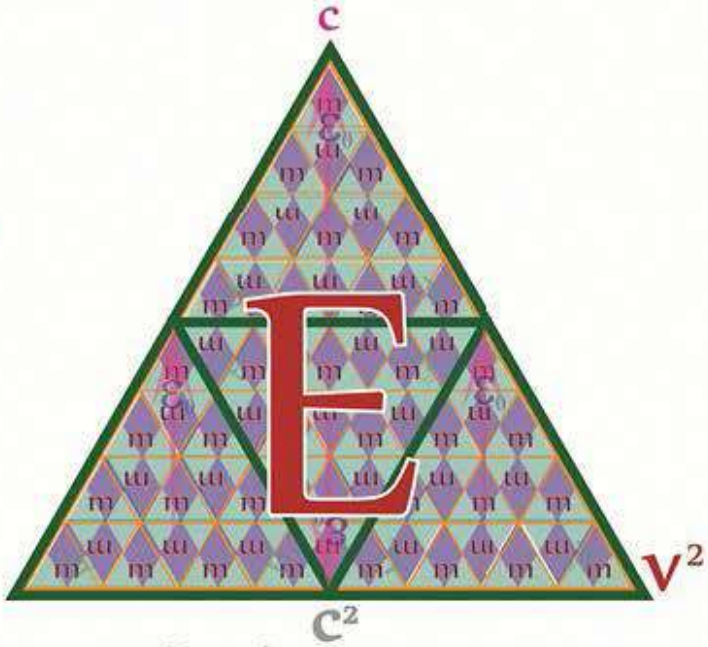
EM mass is related to Matter throught the square of the velocity of light of 8.987551787 e16 m²/s² [c²]

EM mass-Matter

$$E = Mc^4$$



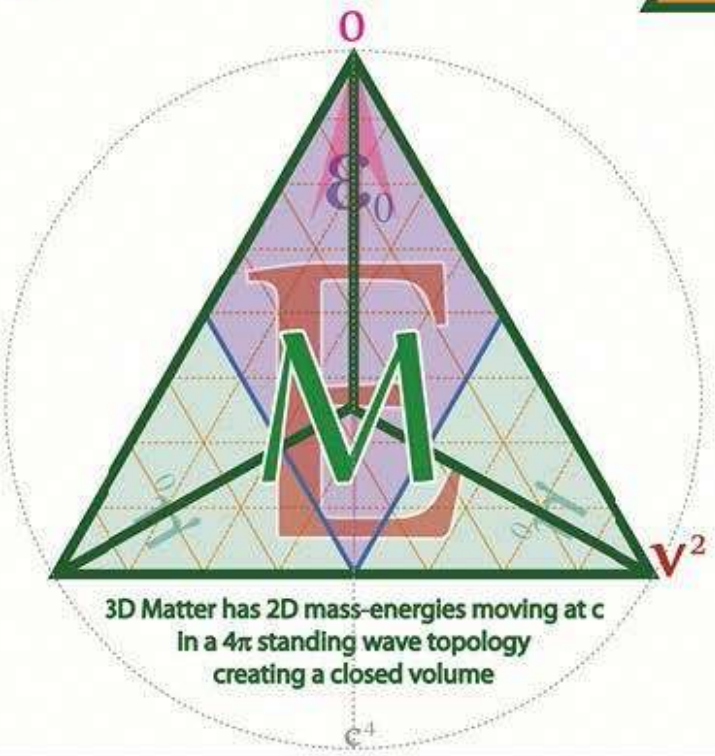
Electro-Magnetic mass



Matter's energy quanta

scalar EM mass

$$M = \frac{E}{c^4}$$



3D Matter has 2D mass-energies moving at c
in a 4π standing wave topology
creating a closed volume

quantised mass

$$h = \frac{E}{v^2}$$

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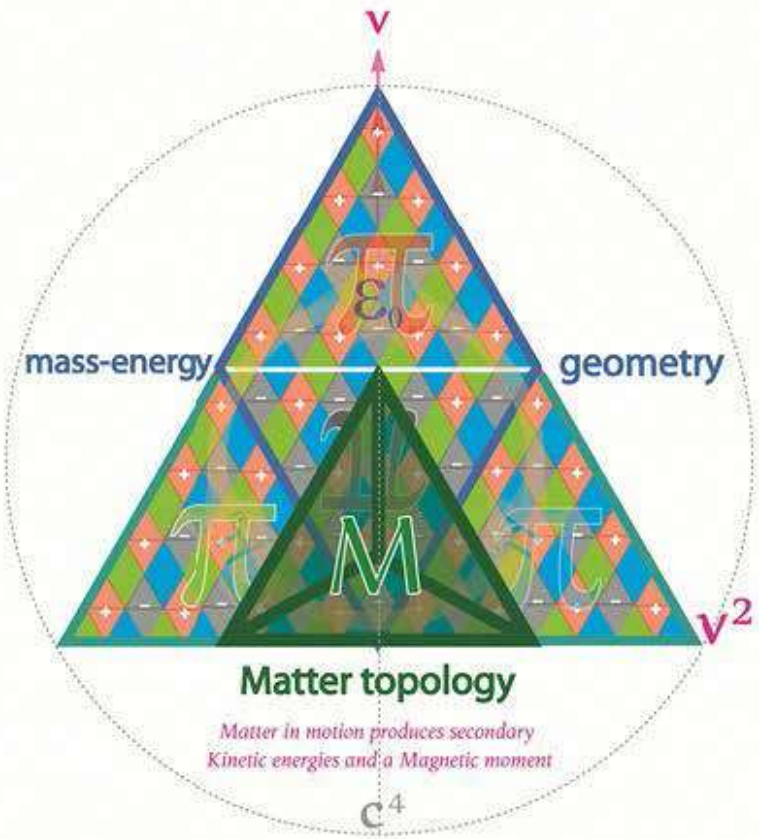
Kinetic Electro-Magnetic fields

[The energies of Motion]



$$p^2 = E = Mv^2$$

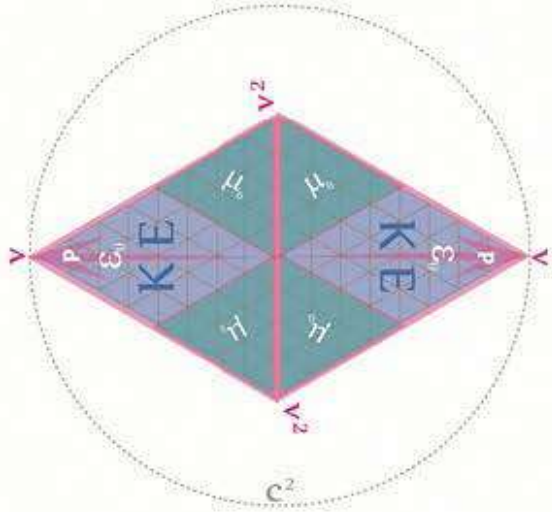
The Electric field energy in any EM field is equal and orthogonal to the Magnetic field energy

$$p^2 = KEM = Mv^2$$

$$\mu_B = \frac{1}{2}Mv^2$$

$$KE = \frac{1}{2}Mv^2$$

All Matter in motion possess momenta and kinetic mass-energies in extrinsic KEM fields



$$E_\gamma = \frac{2mv^2}{c^2}$$

These 2D planar fields are subject to Lorentz factor corrections that apply to the KEM field mass-energies of Matter in motion

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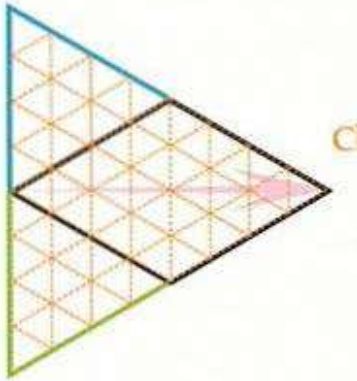
Charge & Kinetic EM fields

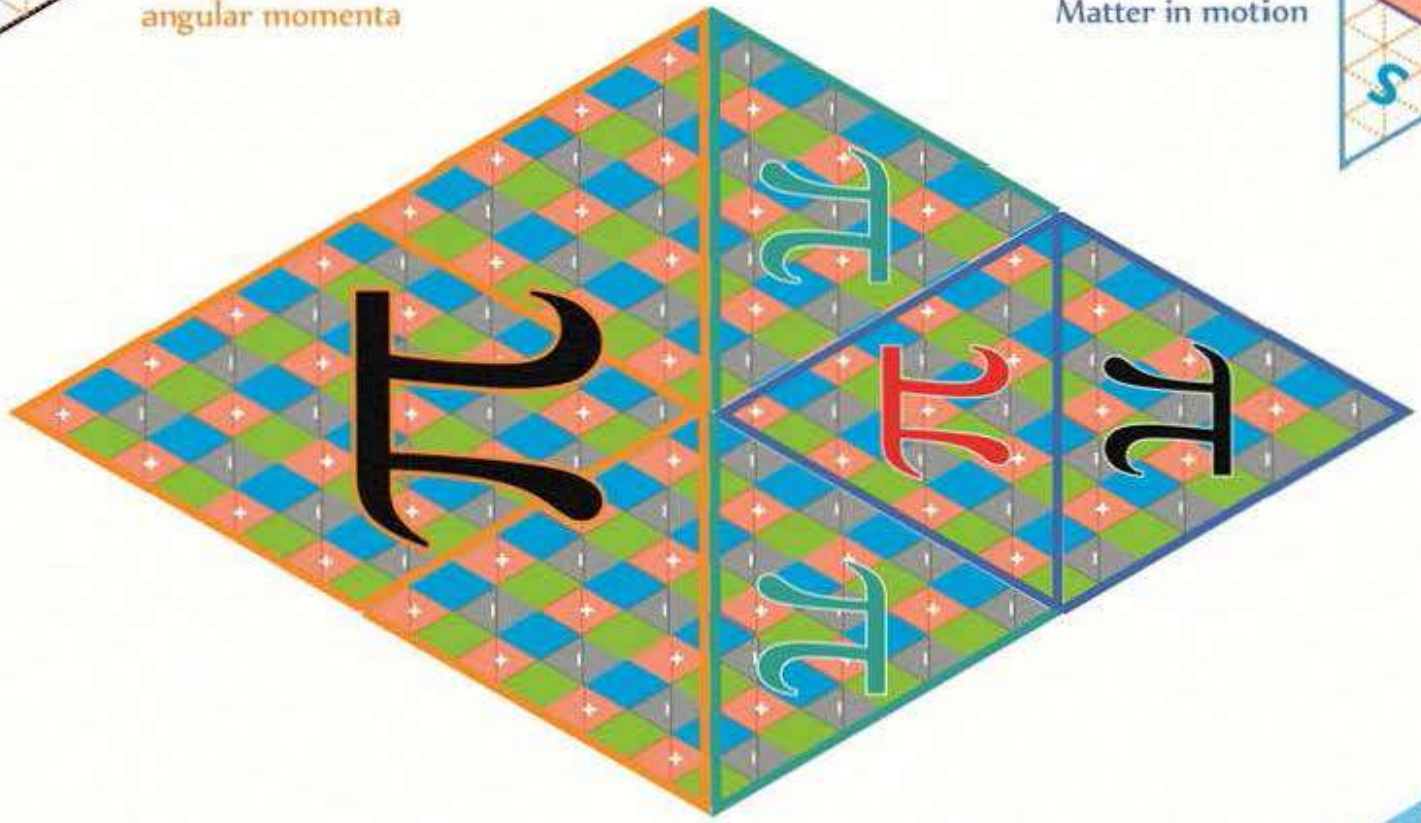


Charges are the result of quantised angular momenta

Kinetic Energies result from Matter in motion

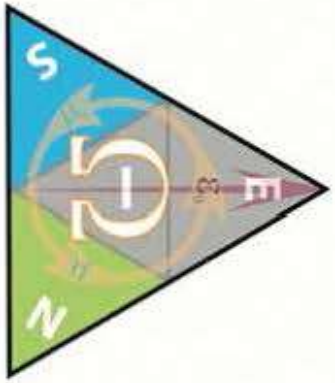
$mv^2 = E = h\nu^2$

$p^2 = E = m\Omega v^2$



$KEM = Mv^2$

$KE = \frac{1}{2}Mv^2$



EM field energies externalised on the fascia of 3D Matter geometries form the physical property known as elementary Charge

[k]EM energies in amy region of free space are viewed as either a Kinetic energy field with an associated Magnetic moment or a neutral charge Photon of ElectroMagnetic mass-energy

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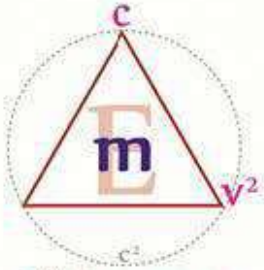
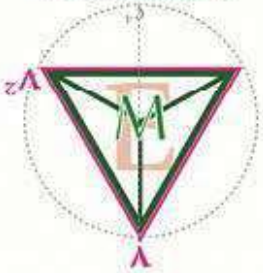
$$m_o = \frac{E}{c^2}$$

Rest mass is equivalent to the total quantity of Energy in a body or system (divided by c²)

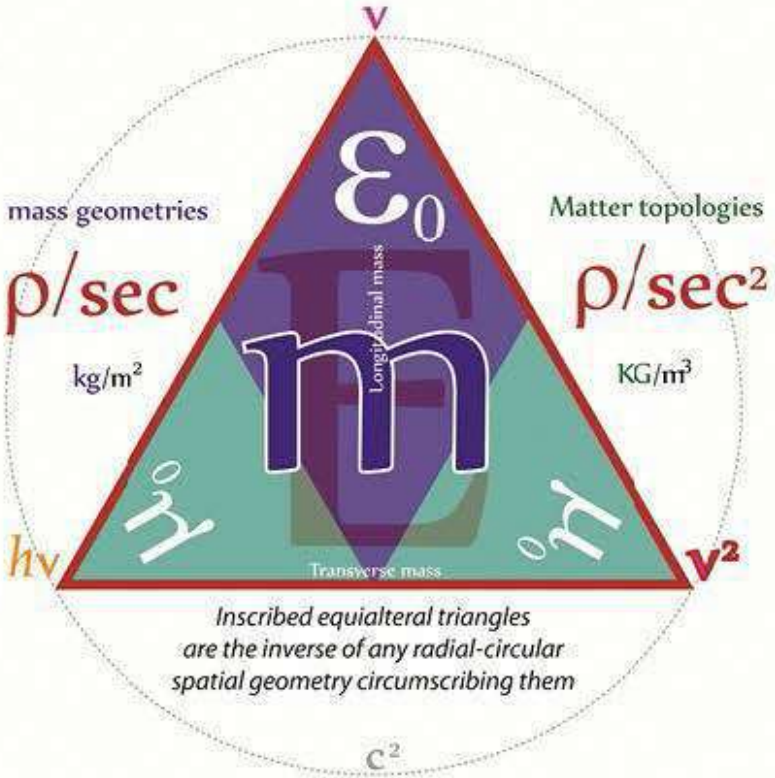


2D fields propagate at c
3D Matter moves at v



inertial mass

$$m = \frac{F}{a}$$



Inscribed equialteral triangles are the inverse of any radial-circular spatial geometry circumscribing them

mass must be distinguished from Matter in physics, because Matter is a poorly-defined concept in modern science, and although all types of agreed-upon Matter exhibit properties of mass, it is also the case that there many types of Energy that posses NO Matter topology, such as potential energy, kinetic energies and electromagnetic radiation (photons)

$$n\pi_{\text{mass}} \left[\left[\varepsilon_0 \mu_0 \right]_{\text{ElectroMagnetic}} . \left[m\Omega v^2 \right]_{\substack{\text{mass} \\ \text{velocity}}} \right]$$

EM Field · Planck quanta

The term 'massless' must be re-termed 'Matterless' to reflect true physical attributes of mass-energy-momenta

EM mass is a planar measurement of 2D energy per unit of time

Thus, all 3D Matter topologies have charged fascia comprised of 2D scalar of mass-energies, but closed volume 3D topology is not a property of 2D EM mass-energy geometries

mass

$$\rho$$

EM mass is a measure of planar energy density per second

$$\frac{mv^2}{c^2} \quad \boxed{\frac{m\Omega v^2}{c^2}} \quad \frac{hv^2}{c^2}$$

per unit of time

EM mass geometries are subject to Lorentz corrections

velocity · QAM quanta

$$\frac{mv^2}{c^2} = \frac{m\Omega v^2}{c^2}$$

per unit of time

Gravitational Matter

$$g = G\frac{M}{r^2}$$

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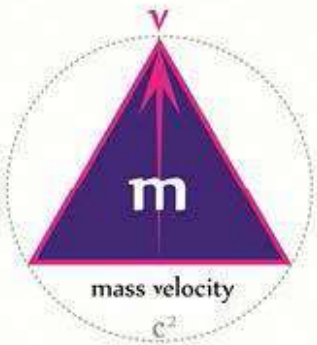
Electromagnetic mass-energy



In physics, EM mass–energy equivalence is the concept that the EM mass of a body is a measure of its energy content

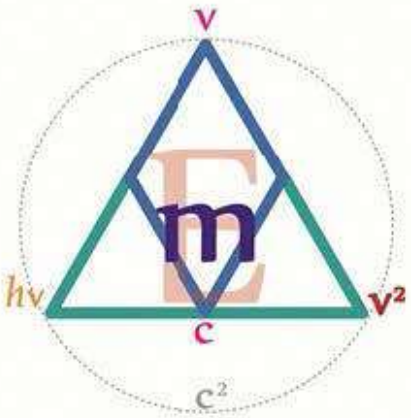
Using this concept, EM mass is a property of all Energy, and Energy is a property of all EM mass, and the two properties are connected by a constant.

Using Tetryonic geometry it can be shown that the constant is the equilateral geometry of QAM thus unifying Classical mechanics and Relativisic mechanics

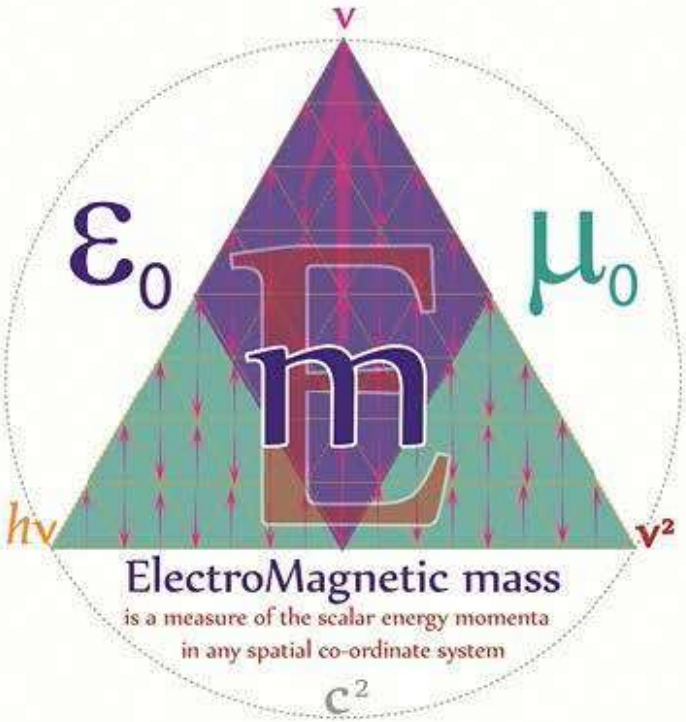
2D mass-ENERGY geometry is NOT 3D Matter topology

$$m = \frac{E}{v^2}$$

Classical mass



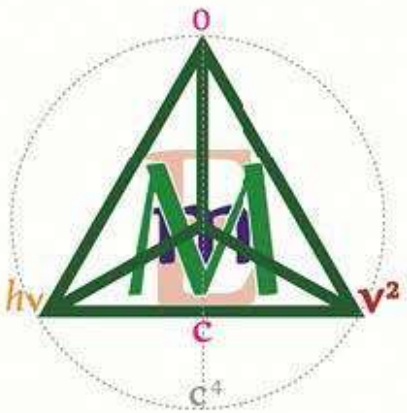
radiant 2D mass-energies are planar equilateral energy geometries



Relativity shows that rest mass and rest energy are essentially equivalent, via the well-known relationship ($E=mc^2$)

$$m = \frac{E}{c^2}$$

Relativistic mass



standing-wave 3d mass-Matter are tetrahedral energy momenta topologies

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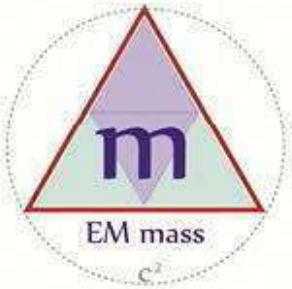
EM mass-Energy-Matter



$$\left[\frac{\Omega}{c^2}\right]$$

Charge is a measure of the quantised angular momentum of any physical system

Tetryonic Matter — planar spatial Impedance — Planck quanta

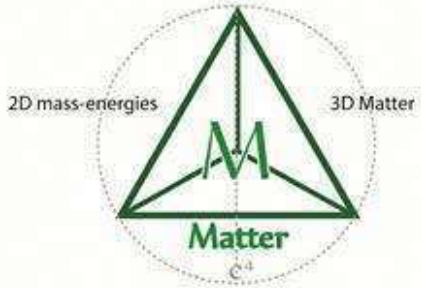
$$T\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

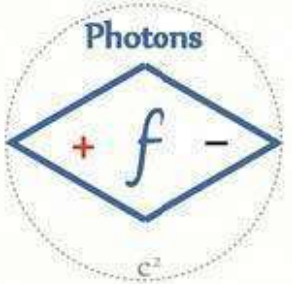
3D topology — ElectroMagnetic — 2D mass — velocity

Planck quanta

$$\left[m\Omega v\right]^2$$

mass — velocity





$$1\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

ODD quanta

$$4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

TETRYONS

$$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EVEN quanta

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EM mass-Energy momenta

Energy

$$\left[\frac{m\Omega v^2}{s}\right]$$

$$E$$

6.629432672 e-34 J

mass-Energy

7.376238634 e-51 kg

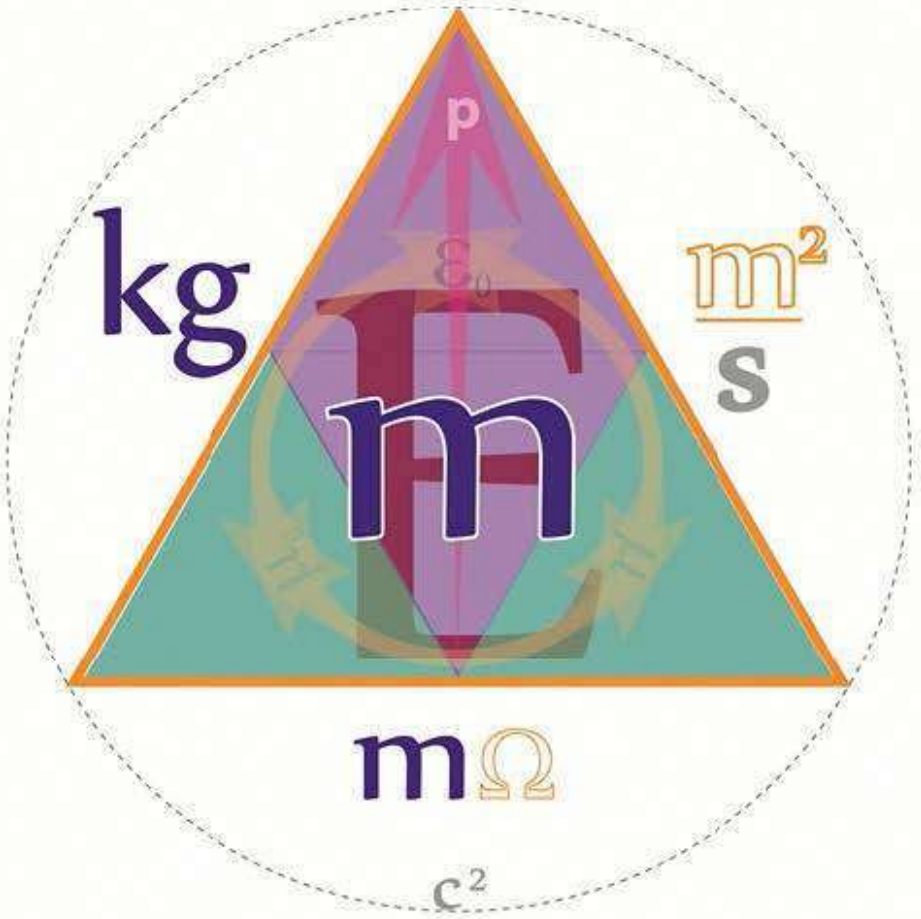
$$m$$

$$\left[\frac{E}{c^2}\right]$$

mass

Planck's Constant

is the 'quantum of Action'



$$6.629432672 \times 10^{-34}\ \text{J.s}$$

mass momenta

quantised angular momenta

$$\left[\frac{m^2}{s}\right]$$

$$\Omega$$

0.0012 m2/s

Charge-momenta

1.33518 e-20 s

$$s$$

$$\left[\frac{\Omega}{c^2}\right]$$

charge

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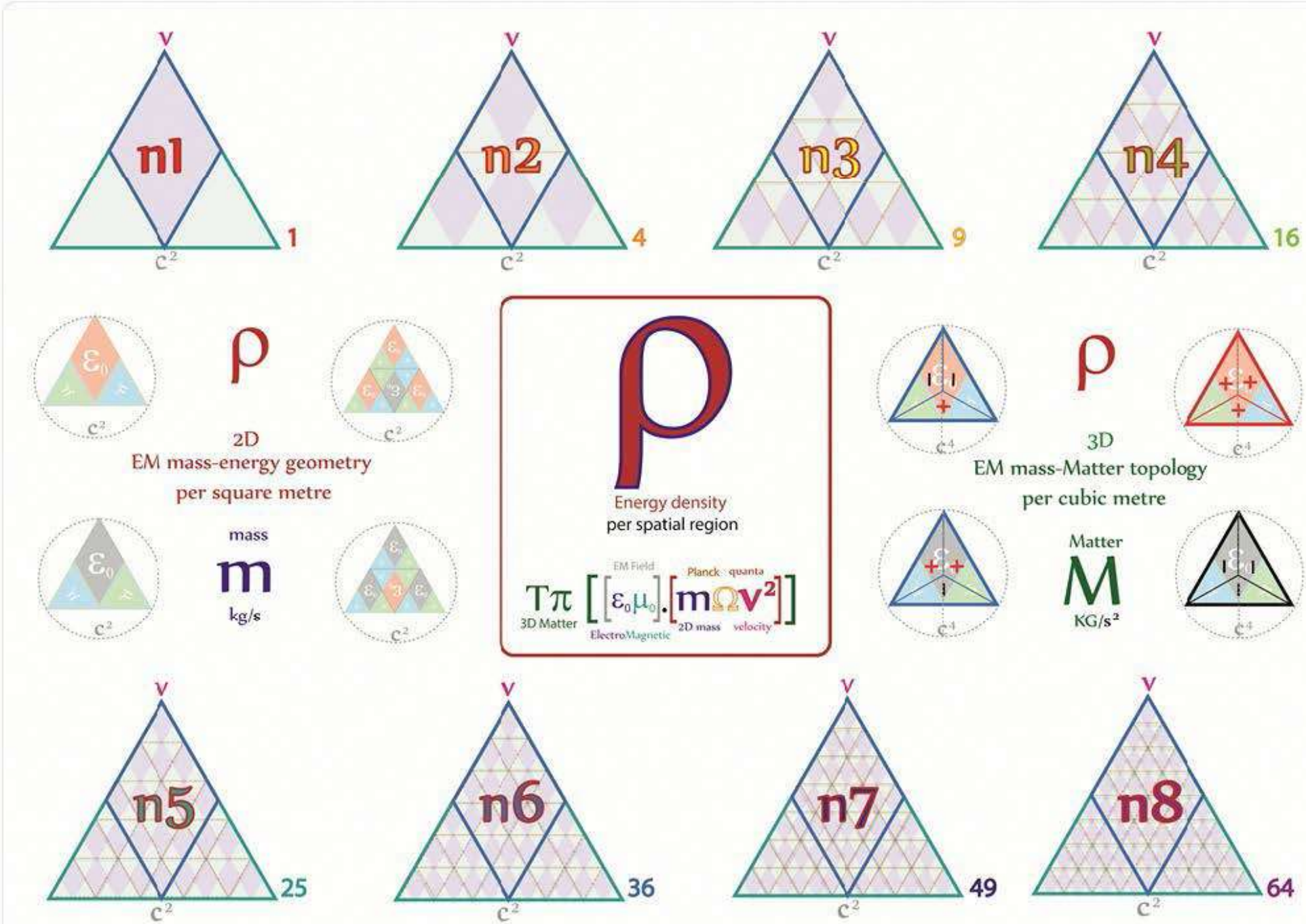

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Zero Point Fields [ZPFs]

ZPFs are quantum inductive tank circuits
(Short-circuited 'IDEAL' inductors with energy)
ZPFs charge energies do NOT oscillate
[The magnetic dipole vector determines charge]

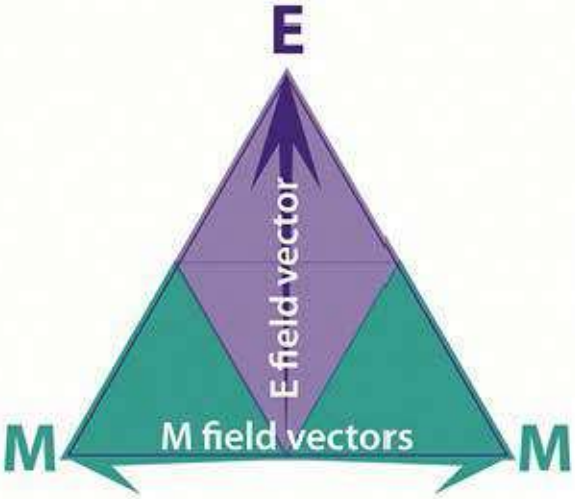
IDEAL QUANTUM INDUCTORS
(equilateral triangle Energy geometry)

The EM FIELD

Electric flux fields can propagate in any direction
Magnetic fields are always at 90 degrees to Electric fields

Magnetic dipole fields propagate in 2 directions at
180 degrees to each other (bi-directionally)
forming North and South poles

**Electric flux field energy is directly proportional to
the resultant Magnetic dipole field energy
and vice versa**



The linear Electric field strength is directly
proportional to its associated transverse
Magnetic field which propagates bi-directionally
from & into the bloch wall of the Zero point field

h
Positive Charge ZPF
Nett positive Planck quanta
with North-South m-dipole vector

Zero Point Fields consist of
Electric and Magnetic (EM) fields
propagating at 90 degrees
to each other

Magnetic MONOPLES do NOT exist
Energy quanta always form charged Electric fields and dipole Magnetic fields

As localised energy quanta increases
(number of ZPFs per time unit)
the charge geometry remains the same

h
Negative Charge ZPF
Nett negative Planck quanta
with South-North m-dipole vector

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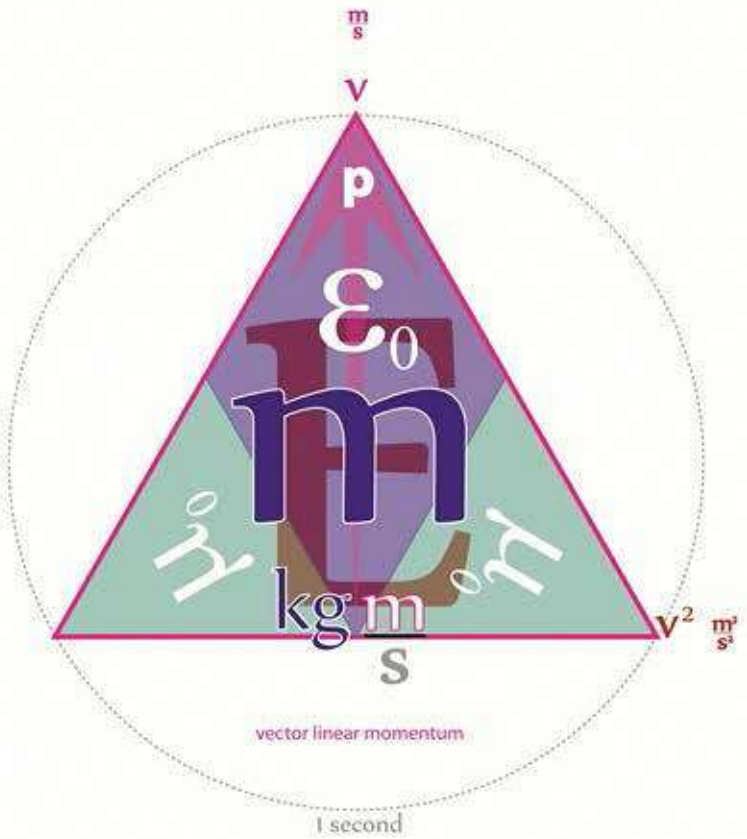
Quantised Angular Momentum

is the equilateral geometry of scalar energy momenta per unit of time

$mv^2 = E$

$E = hv^2$

$\frac{m^2}{s}$



$m\Omega$

mass-QAM

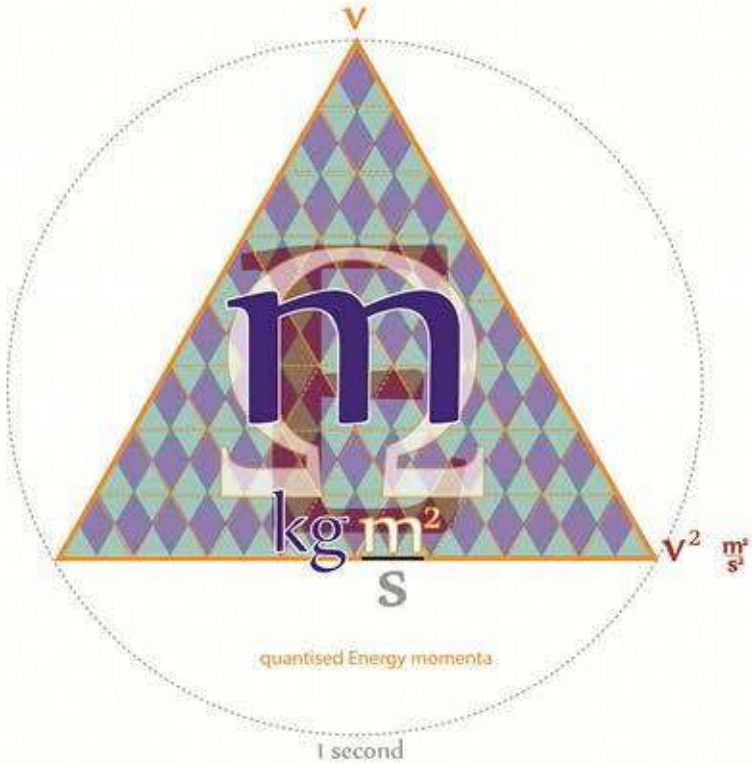
6.629432672 e-34 J.s

Planck quanta $[m\Omega v]^2$ mass velocity

7.376238634 e-51 kg

mass

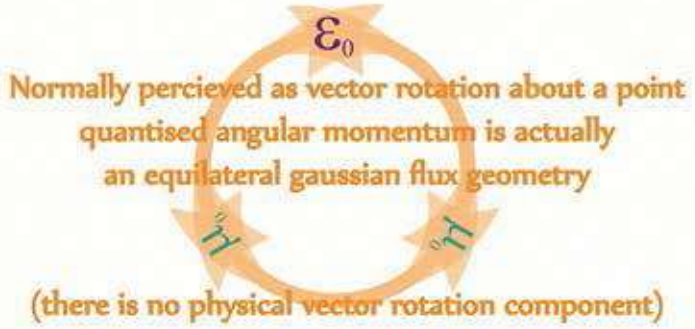
m



p

linear momentum

$\frac{kg\,m^2}{s}$



Normally percieved as vector rotation about a point
quantised angular momentum is actually
an equilateral gaussian flux geometry

(there is no physical vector rotation component)

h

Planck's Constant

$\frac{kg\,m^2}{s}$

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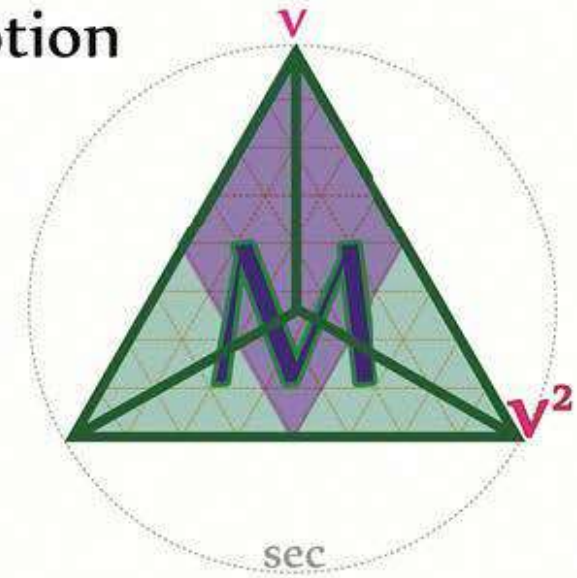
Charged mass & Matter in motion

produce differing but related measurments of EM force

Charged masses per second $\frac{C}{s} \approx kg \approx A$ Charged Matter in motion

Amperes



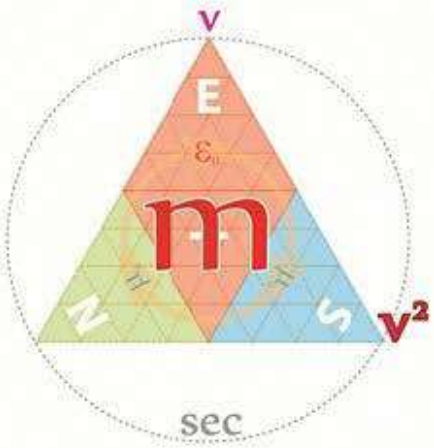
By definition in Tetryonics the quantised angular momentum of mass in any defined spatial co-ordinate system provides the quantum basis for

$$kg\,\frac{m^2}{s}$$

charged mass-energies

Quantised angular momenta creates CHARGE

Vector linear momentum creates CURRENT

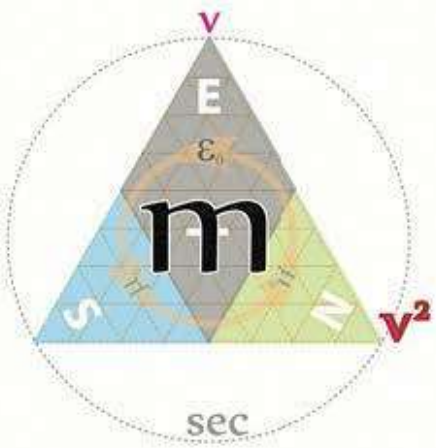


charged mass

$$C \approx kg.s \approx As$$

Coulombs Amp.sec

Charge, through its energy interactions, creates the geometric scaffolding for ALL 3D EM mass-Energy-Matter geometries



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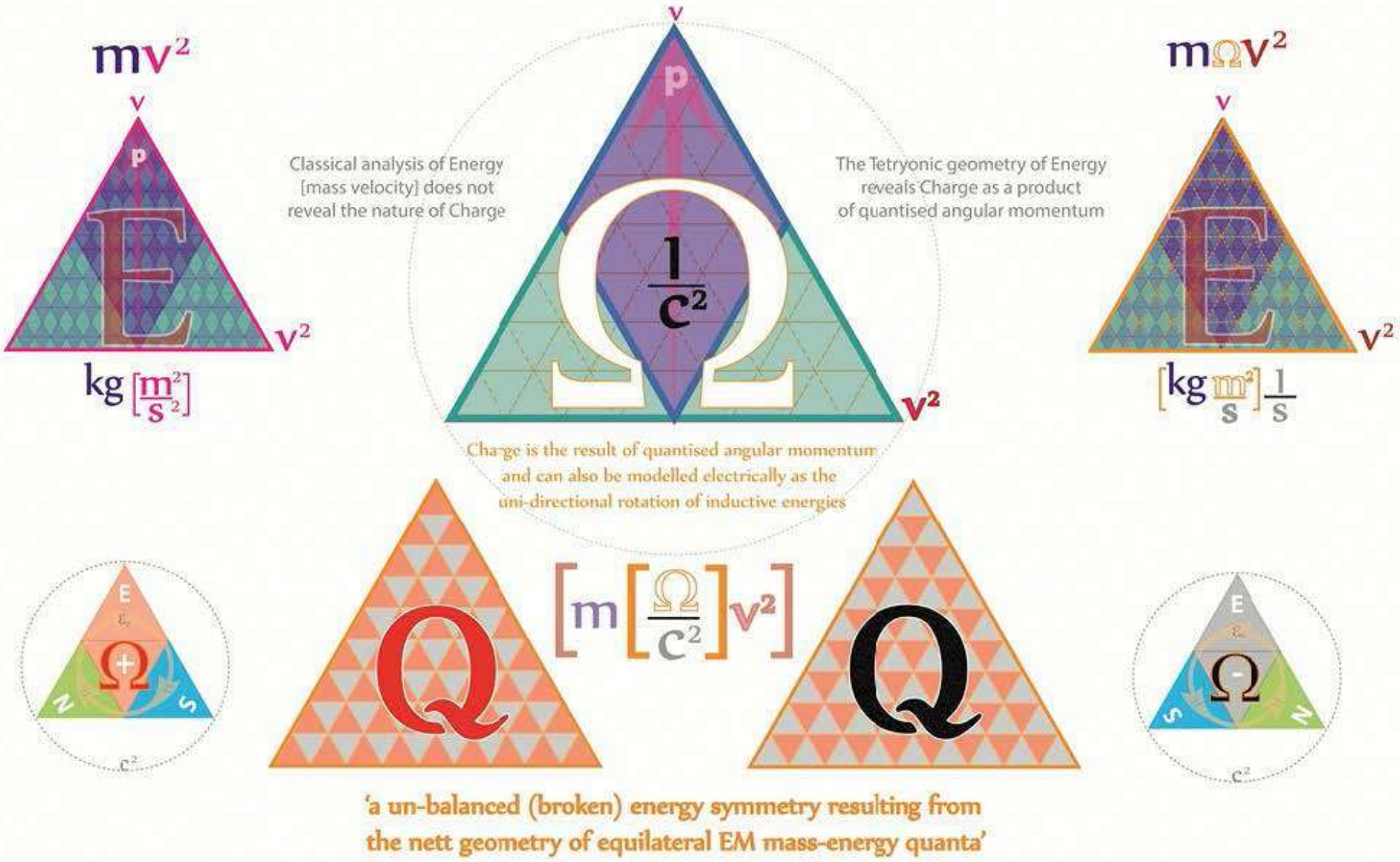
Charged mass geometry

The symmetry of Charge geometries provides a geometric foundation
for all mass-Energy-Matter particles and physical forces



'a un-balanced (broken) energy symmetry resulting from
the nett geometry of equilateral EM mass-energy quanta'

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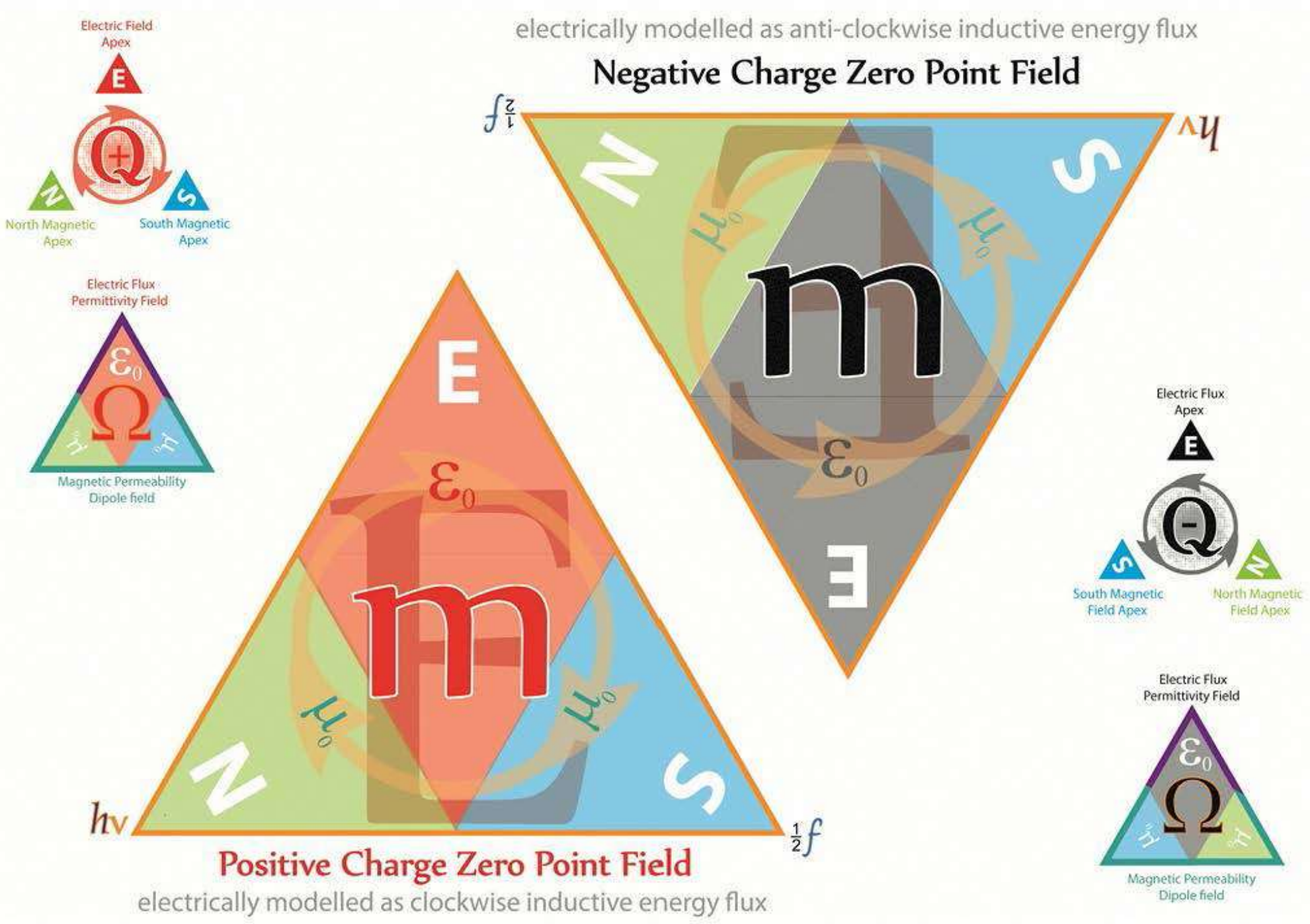

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Elementary and quantum Charges

"All kncwn Fermions have charge topologies that are integer 1/3 multiples of the elementary charge"

It can be shown that the "quantum of charge"
is the intrinsic angular momentum of a Planck mass

It then follows that Quasi-particles
[Tetryons and Quarks]
have charge topologies with nett charges of 0, 4 and 8

Further, it can be shown that the "elementary charge"
applied to Leptons and Baryons (12 times quantum charge)
is reflective of their nett charged Matter topologies

$$T\pi[\pm q]$$

topology · charge · geometry

All Charged particles and their respective KEM fields can be modelled with ZPF field geometries reflective of their nett Charge topologies

Opposites attract
Similars repel

Quarks

up	anti-down	down	anti-up
+2/3	+1/3	-1/3	-2/3
Charmed Top	Strange Bottom	Strange Bottom	Charmed Top

Leptons

Positron	neutrino	Muon
Tau anti-electron	Tau neutrino	Tau

Baryons

+1	0	-1
Proton	Neutron	Negatron

quantised Charges
(EM energy flux rotation within a ZPF geometry)

q
quantum charges
[v] [v]

The elementary charge, usually denoted as e, is the electric charge carried by a single proton, or equivalently, the absolute value of the electric charge carried by a single electron

[v-v]

Q
Elementary charges

Elementary Charges are the nett charge created by mass-energy-Matter topologies

Tetryons

4	0	4
[4-0]	[2-2]	[0-4]

Quarks

up	down	down	up
8	4	4	8
[10-2]	[8-4]	[4-8]	[2-10]

Leptons

12	0	0	12
[12-0]	[6-6]	[6-6]	[0-12]
e	νe	νe	e

Baryons

Proton	Neutron	Negatron
12	0	12
[24-12]	[18-18]	[12-24]

All Charges seek Equilibrium

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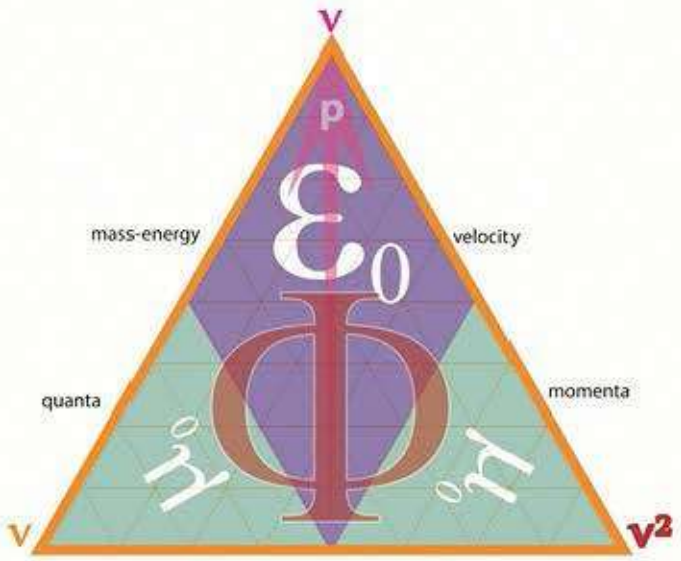
Sir Issac Newton

(25 December 1642 – 20 March 1727)



Any changes to velocity
result in changes to Energy-momenta
within a charged geometry

$$\sum \mathbf{F} = 0 \Rightarrow \frac{d\mathbf{v}}{dt} = 0$$

Newton's first law of motion says:
"A body maintains the current state of motion unless acted upon by an external force."

$$F = ma$$

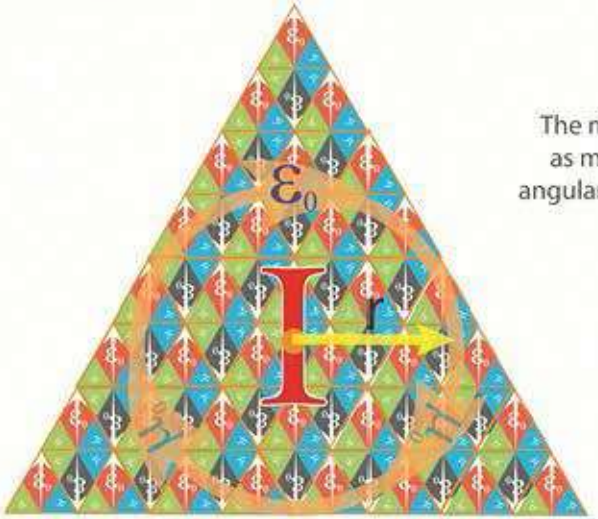
Inertia is the resistance of any physical object to a change in its state of motion or rest, or the tendency of an object to resist any change in its motion.

It is proportional to an object's mass.

$[v-v]$ +

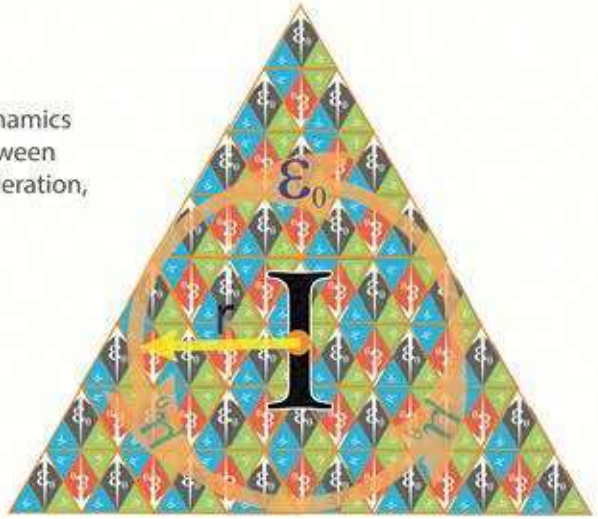
Ideal Inductive loops (ZPF quanta) will oppose ANY changes to their energy levels and consequently, Inertia can be viewed as an outcome of quantum ZPF self-Inductance

$[v-v]$ −



Inertia

The moment of inertia plays much the same role in rotational dynamics as mass does in linear dynamics, describing the relationship between angular momentum and angular velocity, torque and angular acceleration, and several other quantities



The difference between the impeding (inertial) linear momenta and the co-linear (supportive) momenta is a result of the nett Planck mass-energy momenta within the charged geometries of Matter & its KEM fields

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Planck Quanta

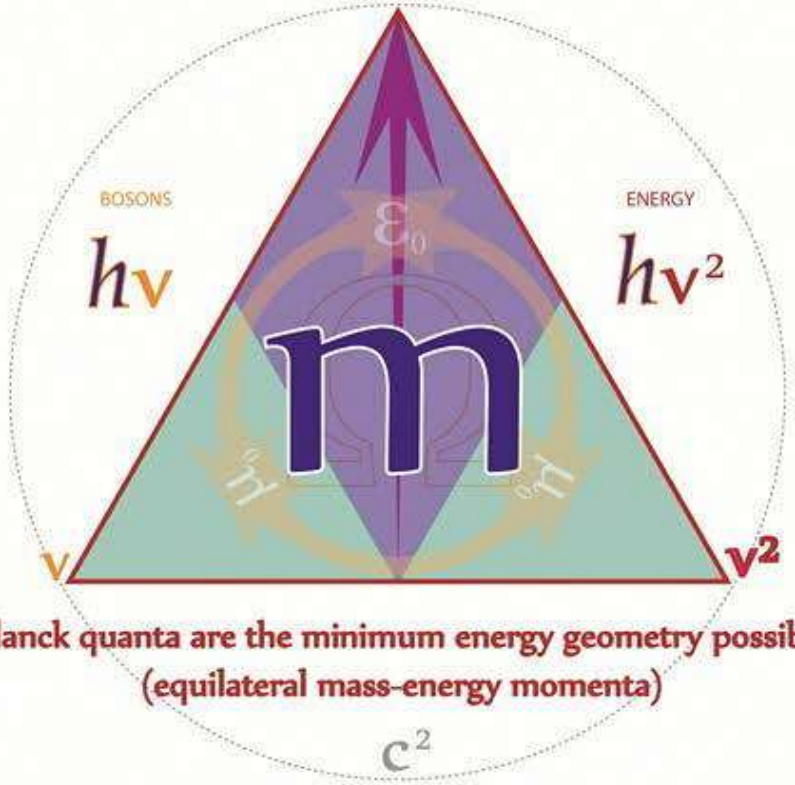
are often defined as the "quantum of action"

h

Planck's Constant

$kg\,\frac{m^2}{s}$

The Planck constant (denoted h), is a geometric constant resulting from QAM in quantum mechanics



Planck quanta are the minimum energy geometry possible (equilateral mass-energy momenta)

c^2

$h\nu$

$m\Omega v^2$

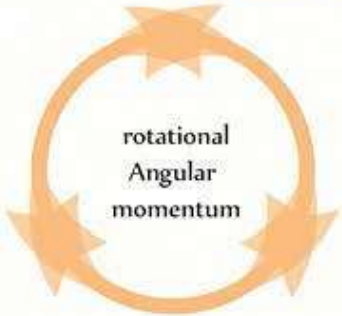
Planck quanta per second

$kg.\left[\frac{m^2}{s}\right].s^{-1}$

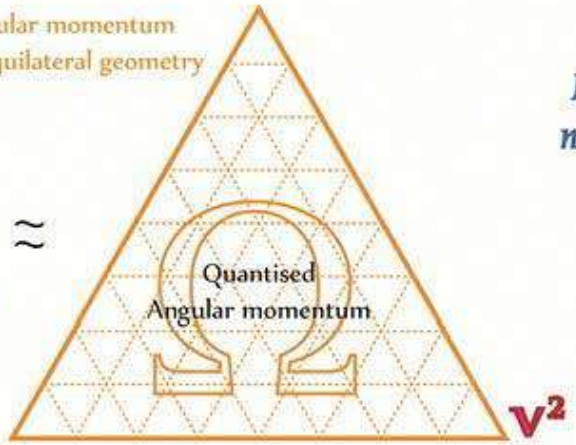
Planck's constant relates the energy in one quantum (photon) of electromagnetic radiation to the frequency of that radiation

Charge is a result of QAM geometry

quantised angular momentum is the result of equilateral geometry



$\simeq$



Photons have neutral quanta geometry

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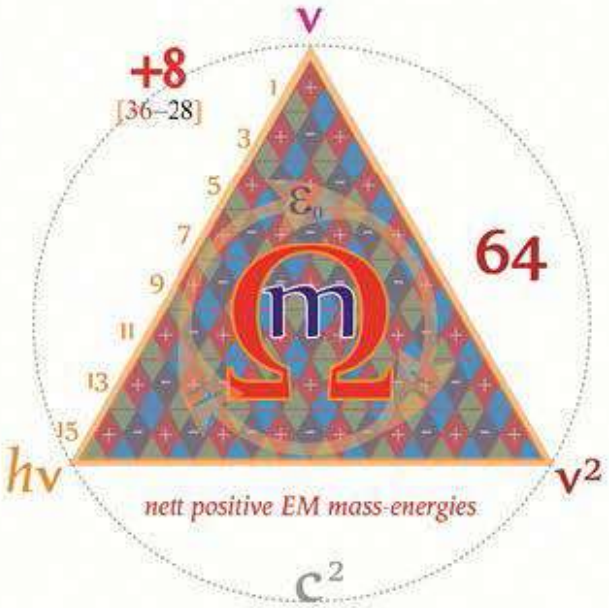
$E = n.h\nu$

Planck Number

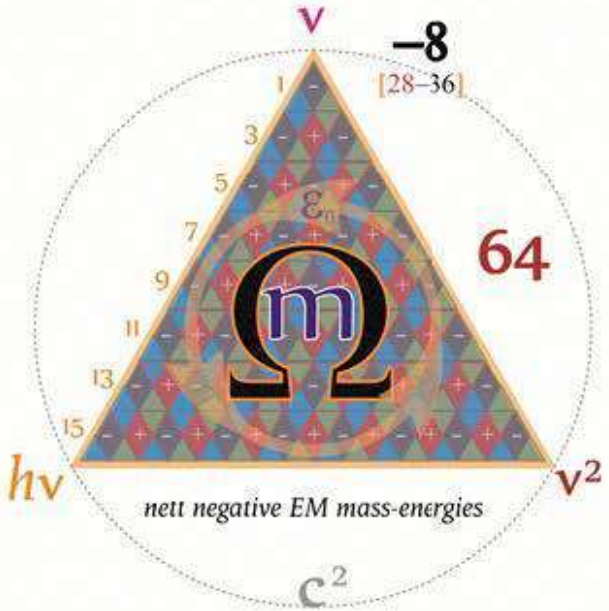


Max Planck

(April 23, 1858 – October 4, 1947)

$h\nu$ tranverse Bosons

hf longitudinal Photons



$1e19\nu = \eta = 5e18f$

quantum number

BOSONS are the quanta of Charge

$1\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega\nu^2\right]\right]$ Boson (EM Field: ElectroMagnetic; Planck quanta: mass, velocity)

Equating number of quanta is the source of a number

$h\nu \neq hf$

Planck Einstein

to photon frequency of quantum misconceptions

$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega\nu^2\right]\right]$ Photon (EM Field: ElectroMagnetic; Planck quanta: mass, velocity)

PHOTONS are the neutral quanta of EM waves

The Planck constant was first described as the proportionality constant between the energy (E) of a photon and the frequency (ν) of its associated electromagnetic wave. [it in fact describes the energy of bosons]

The zero-point energy for a simple harmonic oscillator of frequency f is ½ hf

The relation between the energy and frequency is called the Planck–Einstein relationship.

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Quantum Inductors

An "ideal inductor" has inductance, but no resistance or capacitance, and will not dissipate energy (until it interacts with other ZPFs or Matter) and forms the basis for all Charge-Parity-Time [CPT] interactions

A ZPF is fixed in either a + or - state
[Quantum Inductor circuit]

Its energy flux direction as modelled electrically] is relative to the observer's view or the direction of measurement

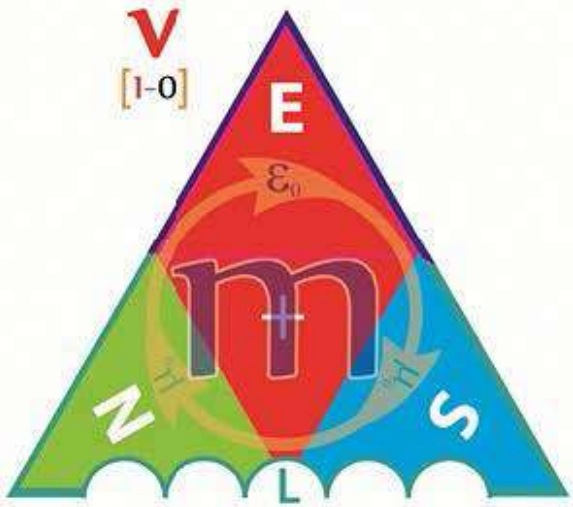
Charge polarity is opposed on opposite faces of the same quoin [quantum coin]

The direction of inherent energy flux from the presective of the observer determines ZPF charge polarity

+ ZPF

A positive ZPF can be viewed as a quantun quoin or an quantum 'ideal' inductor with an internalised energy flux that is the opposite of a negative ZPF

Clockwise current flow

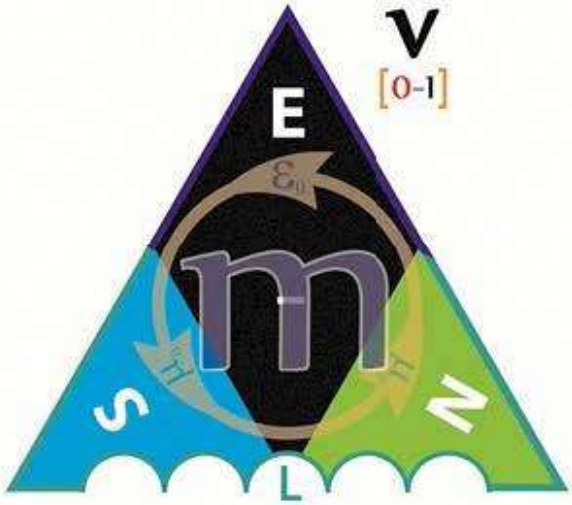


POSITIVE
Quantum L circuit
[quantum inductive circuit]

- ZPF

A negative ZPF can be viewed as a quantum quoin or an quantum 'ideal' inductor with an internalised energy flux that is the opposite of a positive ZPF

Counter-Clockwise Current Flow



NEGATIVE
Quantum L circuit
[quantum inductive circuit]

The Quantum Inductor (L) circuit stores energy as EM mass in π geometries, it does not oscillate

Energy received is stored indefinitely until its release via weak interaction
[Inductive Magnetic coupling]

The quantum Inductive circuit is a SINGLE charge tri-field inductive energy loop

It does not oscillate energy between two opposing charges its differing energy fields are the reuslt of its equilateral QAM geometry storing Electric energy in its E field, and Magnetic energy in its M field

The direction of the QAM flux that models inertia is relative to the observer

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Quantum Inductors and EM energy Levels

coupled ODD# mass-energies
form SQUARE energy geometries

quantum Inductors

Scalar Energies

[1]
Single Quantum Inductor

[1+2]
Coupled Quantum Oscillator

[1+2]
A Coupled Inductance in Parallel with Two Series Inductors
[3+4]

[1+2] [3+5] [4+6]
Three coupled Inductances in Parallel with Three Series Inductors
[7+8+9]

[ZPFs]

[Bosons]

1 — 1^2

3 — 2^2

5 — 3^2

Coupled Inductance

Coupled Inductance

Coupled Inductance

Series Inductance

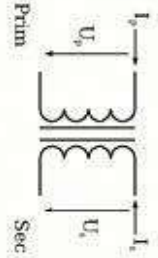
Series Inductance

Series Inductance

All quantum levels form inductive magnetic dipole bases
[Weak Force]

Quantum energy levels can be viewed as various combinations of:

Coupled Inductances



Parallel Inductances

$$L_{total} = \frac{1}{\frac{1}{L_1} + \frac{1}{L_2} + \ldots \frac{1}{L_n}}$$

Series Inductances

$$L_{total} = L_1 + L_2 + \ldots L_n$$

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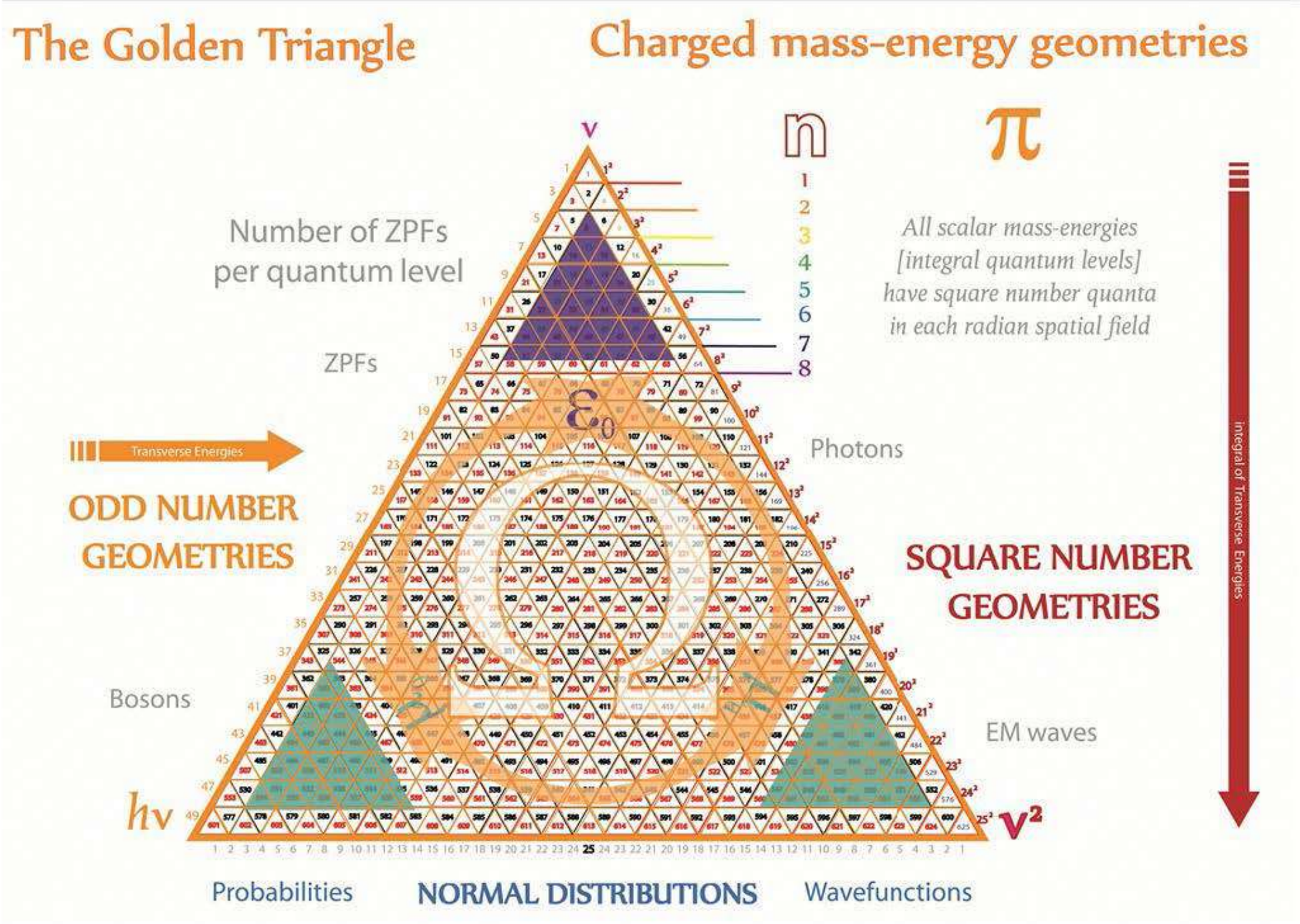

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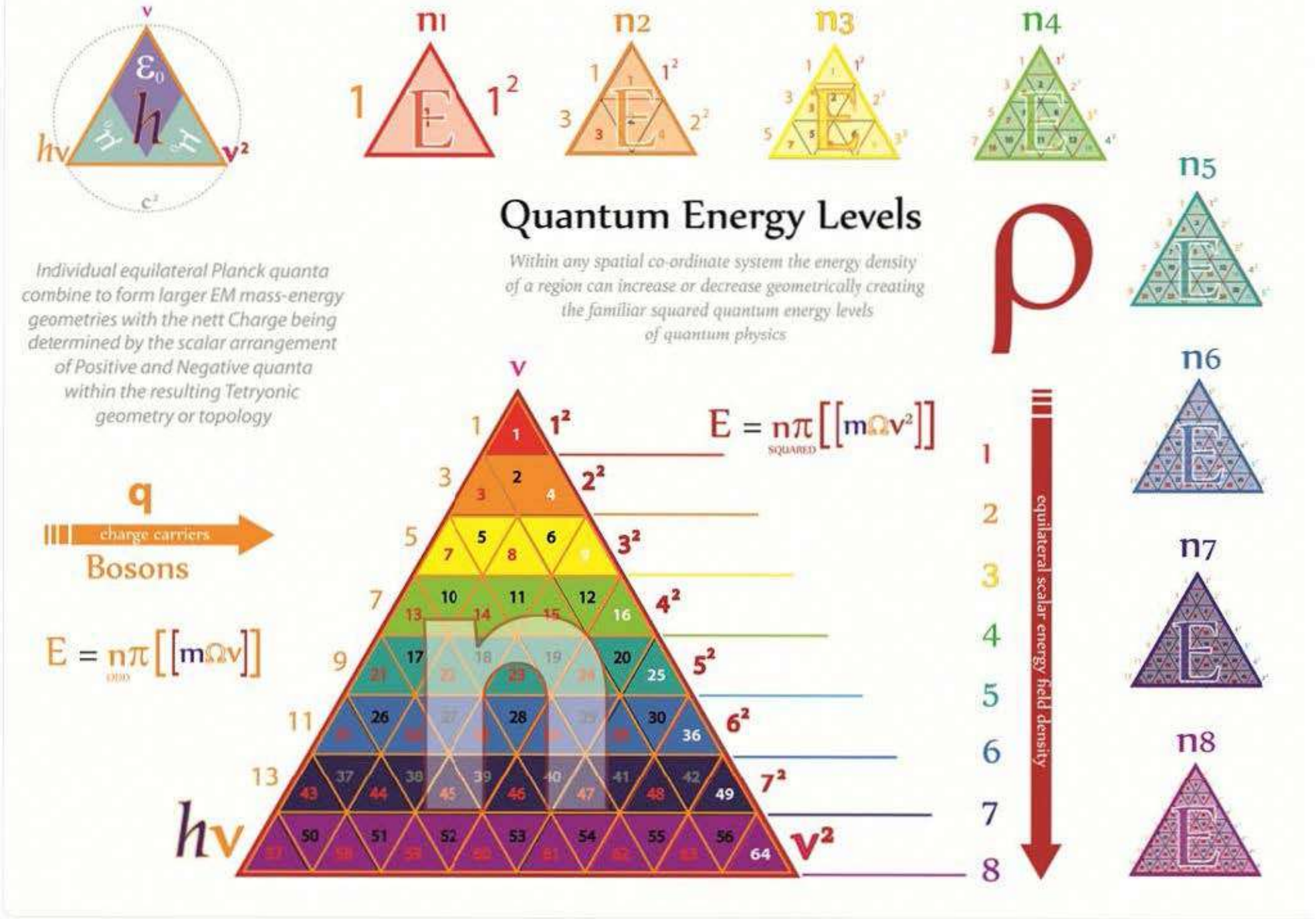
Quantum Energy Levels
Within any spatial co-ordinate system the energy density of a region can increase or decrease geometrically creating the familiar squared quantum energy levels of quantum physics
Individual equilateral Planck quanta combine to form larger EM mass-energy geometries with the nett Charge being determined by the scalar arrangement of Positive and Negative quanta within the resulting Tetryonic geometry or topology
E = nπ[[mΩv²]]
SQUARED
E = nπ[[mΩv]]
ODD
q
charge carriers
Bosons
equilateral scalar energy field density
n1
n2
n3
n4
n5
n6
n7
n8
ρ
hv
v²

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Magnetic Vectors

Intrinsic Magnetic vectors are transverse to E fields

External Magnetic fields are termed B fields

Magnetic vectors can be modelled geometrically or electrically through energy field fluxes [quantised angular momenta]

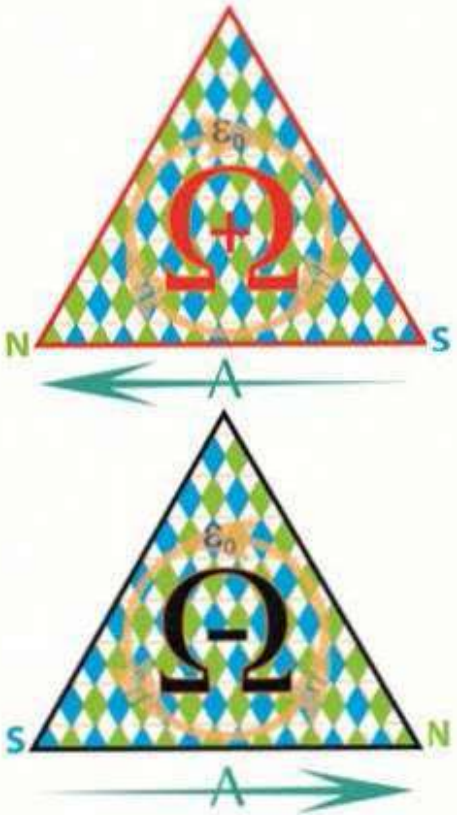
Opposite charges moving in opposing directions produce co-directional Magnetic vectors

Within a Magnetic dipole

Magnetic Vector A

energy 'flows' South to North

External to a Magnetic dipole
energy 'flows' North to South



Opposite charges moving in the same direction produce Magnetic vectors in opposition

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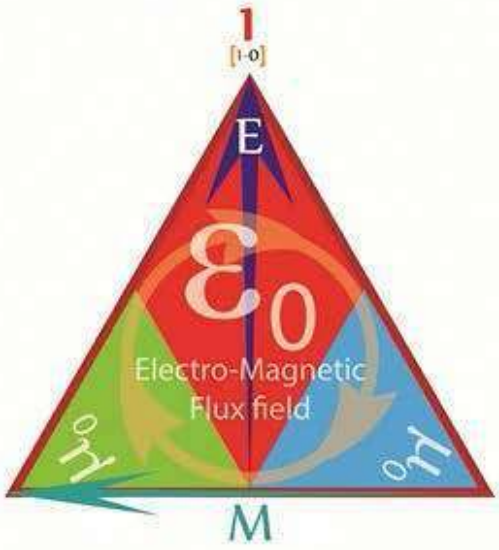
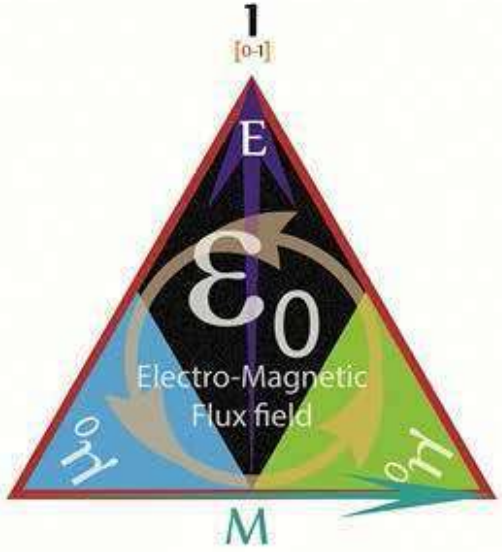
Charge Fields

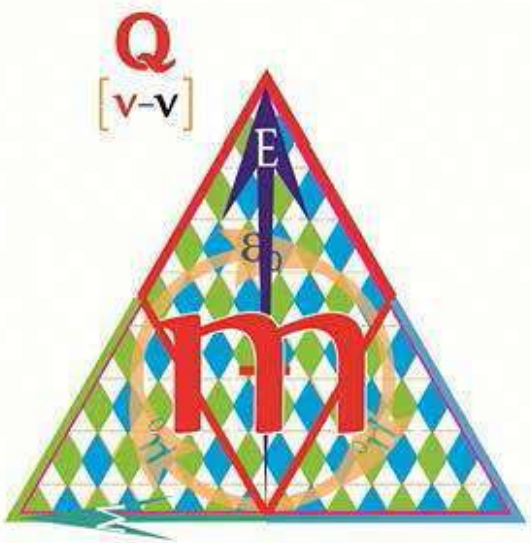


EM energy fluxes in a Positive ZPF flows
are electrically modelled as Clockwise
(from North to South)

The EM flux directions of Charges
can be modelled vectorially with
Electric and Magnetic vectors



EM energy fluxes in a Negative ZPF
are electrically modelled as counter-Clockwise
(from North to South)



All rotational planck energy fluxes
can serve as models for the nett
quantised angular momenta of
any mass-energy geometry

Polarised
Electric and Magnetic fluxes
in ElectroMagnetic fields arise from
intrinsic quantised angular momentum

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EM fields

are the combined Electric & Magnetic fields resulting from the quantised angular momentum of mass-energy in any region of free space

EM Permittivity-Permeability is a measure of how much resistance is encountered when the quantised angular momenta of EM energies form an electro-magnetic field in a vacuum

$$\varepsilon_0 \mu_0 = \frac{1}{c^2}$$

Celeritas = 299,792,458 $\frac{m}{s}$

$$c_0 = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}.$$

EM field Permittivity-Permeability

$$\varepsilon_0 \mu_0 = 1.112650056\text{e-}17 \ \frac{s^2}{m^2}$$

$$\left[\frac{A^2\ s^4}{kg\ m^3} \cdot \frac{kg\ m}{A^2\ s^2}\right]$$

m	=	nπ	$[\varepsilon_0 \mu_0]$	$[m\Omega v^2]$
mass		charged	Spatial geometry	Energy density

Electric Constant

$$\varepsilon_0 = \frac{1}{\mu_0 c^2}$$

$$= 8.85418785\text{ e-}12 \ \frac{F}{m} \quad \frac{A^2\ s^4}{kg\ m^3}$$

The permittivity of empty space, equal to 1 in centimeter-gram-second electrostatic units and numerically, to 8.854 × 10-12 farad per meter in International System units, where c is the speed of light in meters per second. Symbolized ε0.

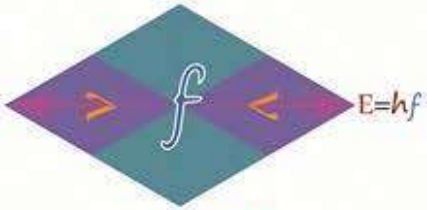
Magnetic Constant

$$k_0 = \frac{1}{4\pi\varepsilon_0}$$

$$= 1.25663706\text{ e-}6 \ \frac{H}{m} \quad \frac{kg\ m}{A^2\ s^2}$$

A measure of the degree to which molecules of some material polarize (align) under the influence of an electric field; symbol k0, units F/m (farads per metre).

$E = 2h\nu$



$\vec{S} = \mathbf{E} \times \mathbf{H},$

The Energy-momenta of ZPFs form natural Poynting vectors

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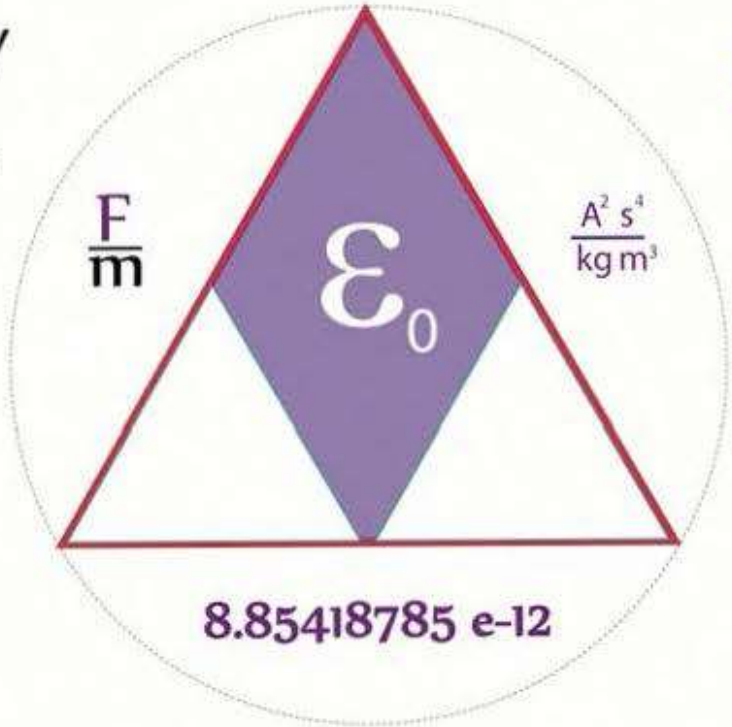
EM field Permittivity

The Electric constant, commonly called the vacuum permittivity, or permittivity of free space, relates the units for electric charge to mechanical quantities such as length and force.

The name Vacuum Permittivty is a misnomer and should be replaced with the correct term EM field Permittivity

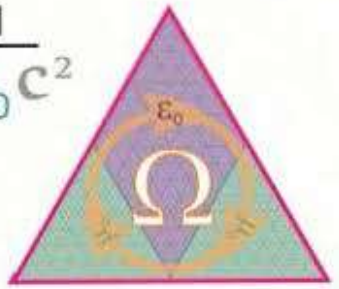
The strength of Electric fields is determined by the Electrical Permittivity Constant

$$E = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}$$



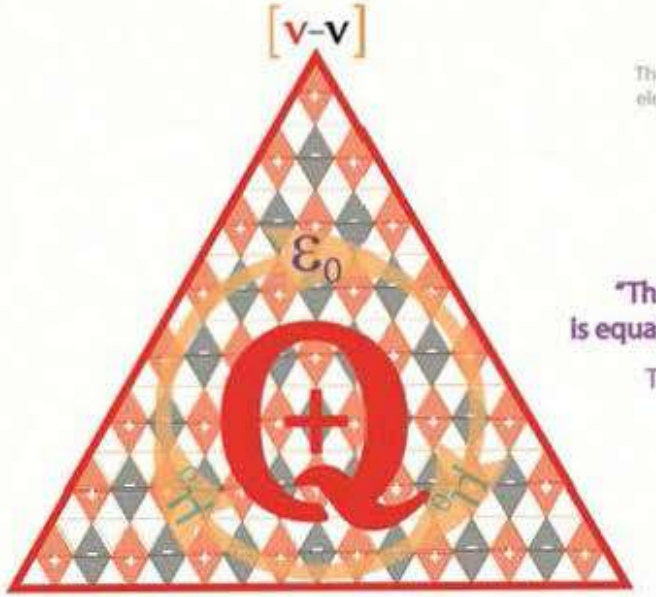
The permittivity of empty space, equal to 1 in centimeter-gram-second electrostatic units and to 107/4πc2 farads per meter or, numerically, to 8.854 × 10-12 farad per meter in International System units, where c is the speed of light in meters per second.

$$\varepsilon_0 = \frac{1}{\mu_0 c^2}$$



"Ampere's Law states that for any closed loop path, the sum of the quantities (B.ds) for all path elements into which the complete loop has been divided is equal to the product of μ0 and the total current enclosed by the loop."

$$k = \frac{1}{4\pi\varepsilon_0}$$



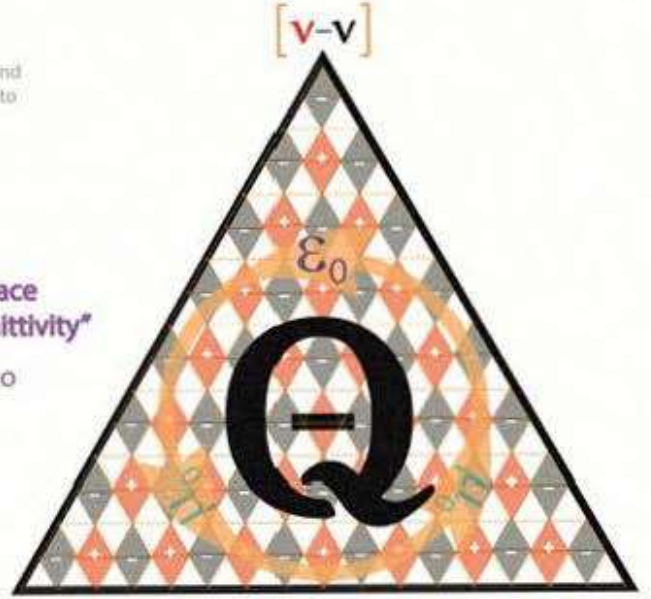
Positive Charge Electric Field

Gauss' Law:

"The total of the electric flux out of a closed surface is equal to the charge enclosed divided by the permittivity"

This applies equally to any geometry chosen to tessellate a surface area

Superpostioned E fields gives rise to Coulomb Forces



Negative Charge Electric Field

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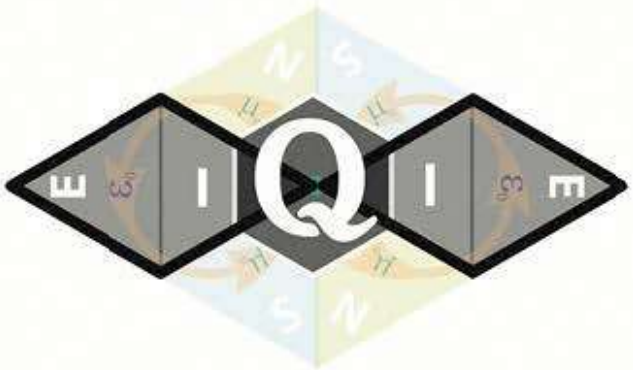
Electric permittivity Fields

Negative externalised Planck quanta
(Counter-clockwise energy fluxs)



Coupled same charge ZPFs
have **neutralised** Magnetic fields

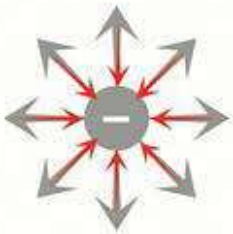
In Electro-statics superpositioned E fields with interactive energy momenta are the interactive mechanism for Coulombic forces

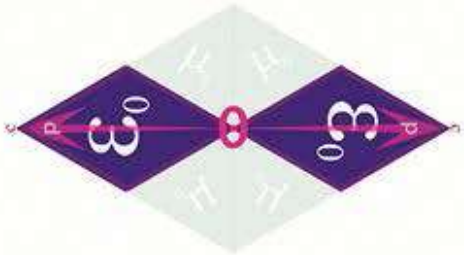
Electrostatic Particles
in motion have Kinetic energies
resulting in Magnetic moments

Positive externalised Planck quanta
(Clockwise energy fluxs)

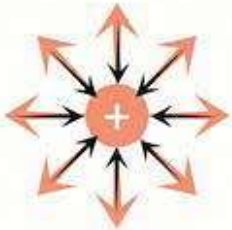
Polar view

Negative E-fields





Polar view

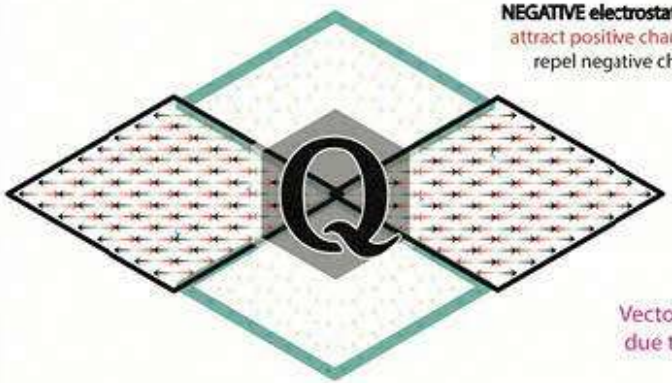


Positive E-fields

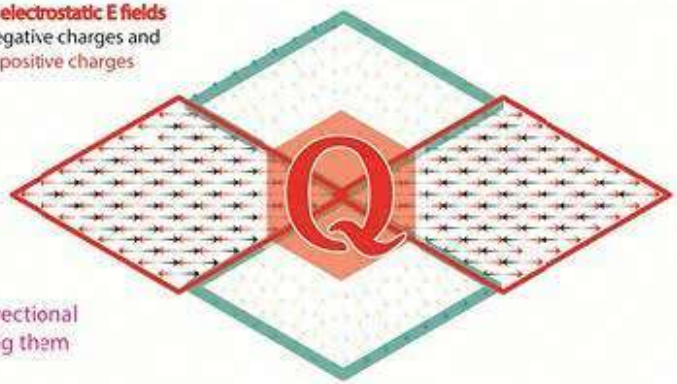
NEGATIVE electrostatic E fields
attract positive charges and
repel negative charges

ε_0

POSITIVE electrostatic E fields
attract negative charges and
repel positive charges



Opposites Attract
Similars Repel



Vectorial momenta forces in EM fields are bi-directional
due to the energy-momenta quanta comprising them

The currently stated 'standard' premise of Electrical Energy flowing from Positive to Negative is misleading (as Energy also flows from Negative to Positive at the same time)

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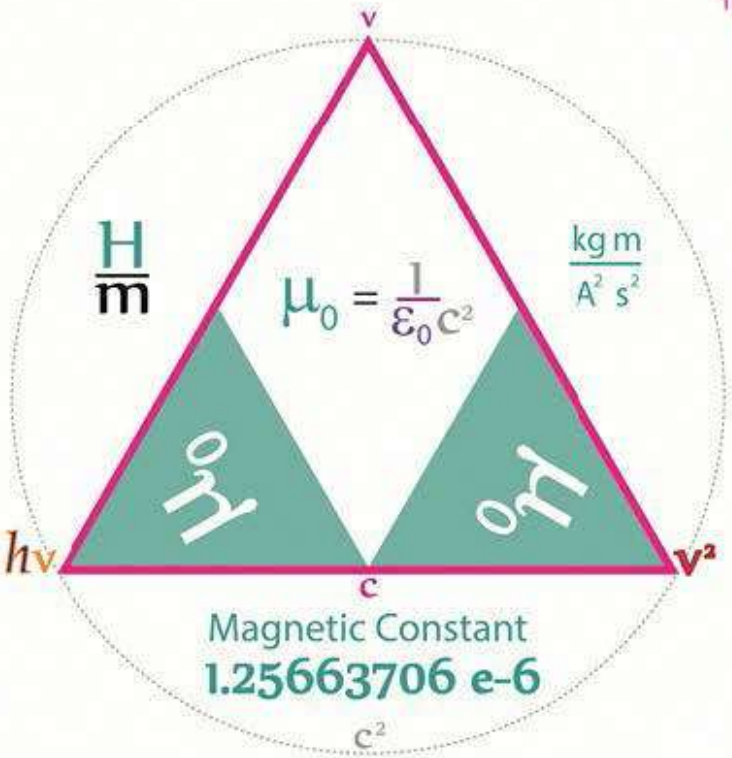
EM field Permeability

The permeability of free space,
also called absolute permeability.

The name Vacuum Permeability is a misnomer and should be replaced with the correct term EM field Permeability

The magnetic constant has the value of
$4\pi \times 10\text{-}7$ henry per meter.

The strength of Magnetic fields is determined by the Magnetic Permeability Constant



F

The magnetic field is most commonly defined in terms of the Lorentz force it exerts on moving electric charges.

The magnetic field generated by a steady current (a constant flow of electric charges in which charge is neither accumulating nor depleting at any point) is described by the Biot–Savart law

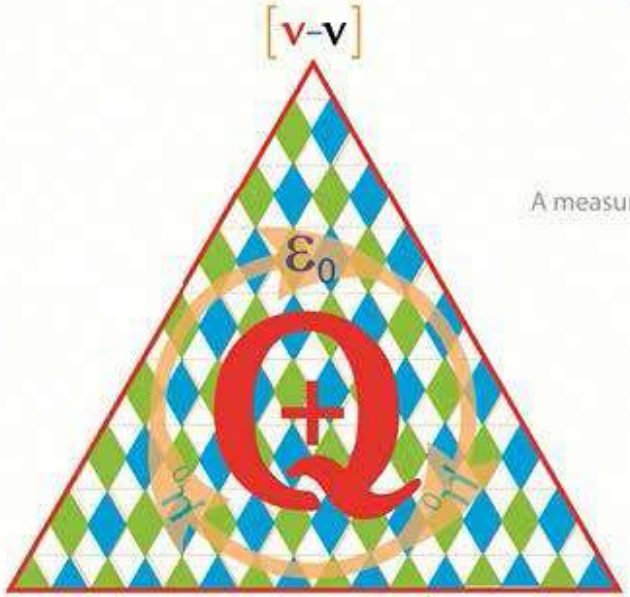
μ_0

$B = \mu_0 H$

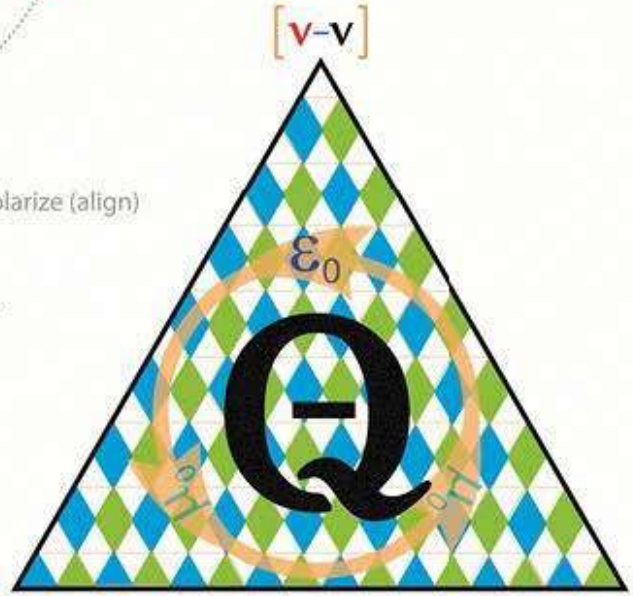
A measure of the degree to which molecules of some material polarize (align) under the influence of an electric field.

Measured in units of units H/m (Henries per metre).

There are
NO magnetic monopoles
[not under any condition]



Positive Magnetic Moment



Negative Magnetic Moment

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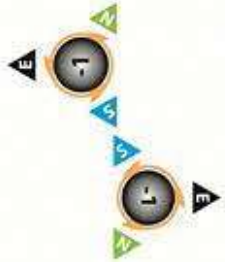
Magnetic permeability Fields

Coupled opposite charge ZPFs
produce **neutralised** Electric fields

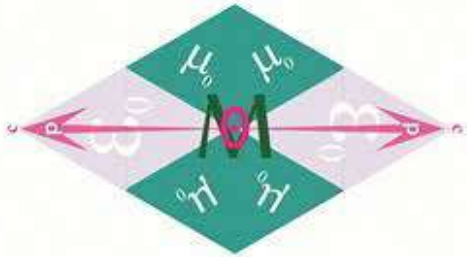
In Magneto statics superpositioned M fields
with interactive energy momenta
are the interactive mechanism
for Lorentz forces

Magneto-static Particles
have enhanced Magnetic moments



Amperes law

Current flowing through a wire
will create a magnetic field

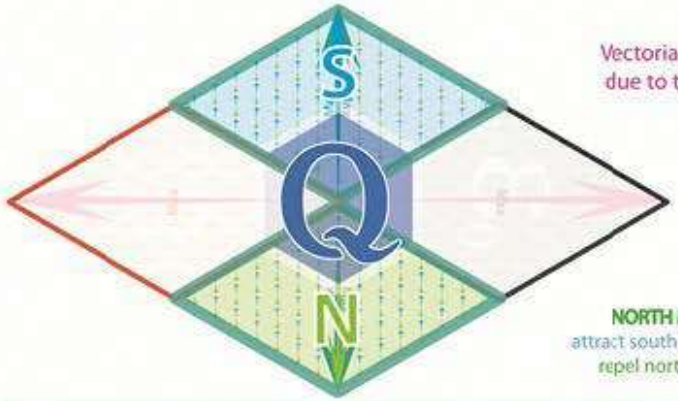


magnetic field forces are
orthagonal to electric Coulomb forces

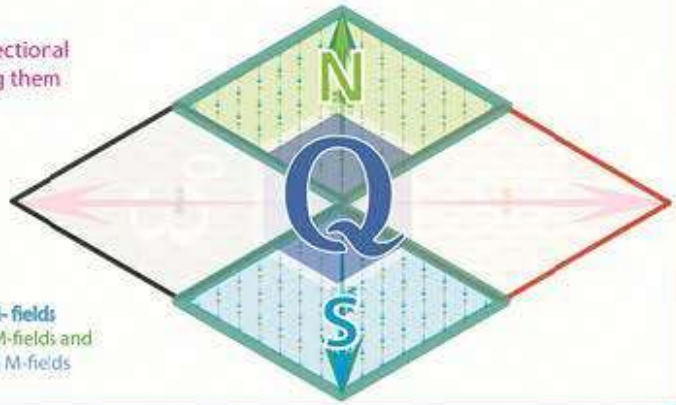
Lorentz forces

charged particles in motion are subject
to forces due to external EM fields

Vectorial momenta forces in EM fields are bi-directional
due to the energy-momenta quanta comprising them



Opposites Attract
Similars Repel



NORTH M- fields
attract south M-fields and
repel north M-fields

μ_0

SOUTH M- fields
attract north M-fields and
repel south M-fields

Magentic fields can only exist in conjuction with Electric fields & Electric fields can only exist in conjunction with Magnetic fields

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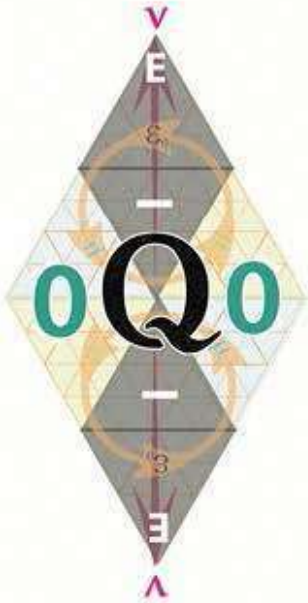
Electro-static fields

Similar charge electric dipole pairings
create 'neutralised' Magnetic dipoles

There are no such things as purely
Electric or Magnetic fields



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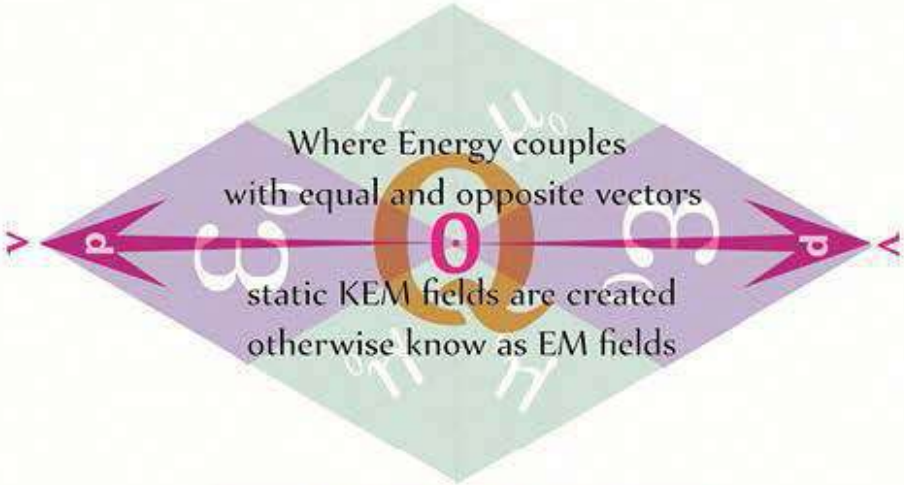

Fields of Force

All energy fields are Electro-Magnetic in nature
a direct product of their equilateral geometry

'Neutralised' electric dipole pairings
create Magnetic dipole fields

Magneto-static fields

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Charged EM field geometries

Opposite charge fields
can produce neutral E-fields
(with magnetic moments)

Electrostatic charged matter generate
charged energy fields around them

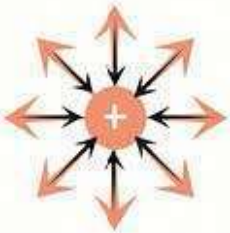
Moving charged particles generate
Kinetic energy & Magnetic moments

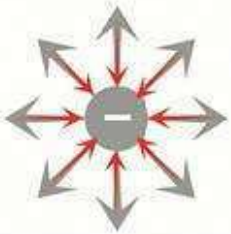
Charged electrostatic fields

accelerate charged particles
vectorally dependent on their quantum
charge mass-energy momenta field geometries

16
[72-56]

Positive charge electrostatic fields
attract Negative charges
repel Positive charges





16
[56-72]

Negative charge electrostatic fields
attract Positive charges
repel Negative charges

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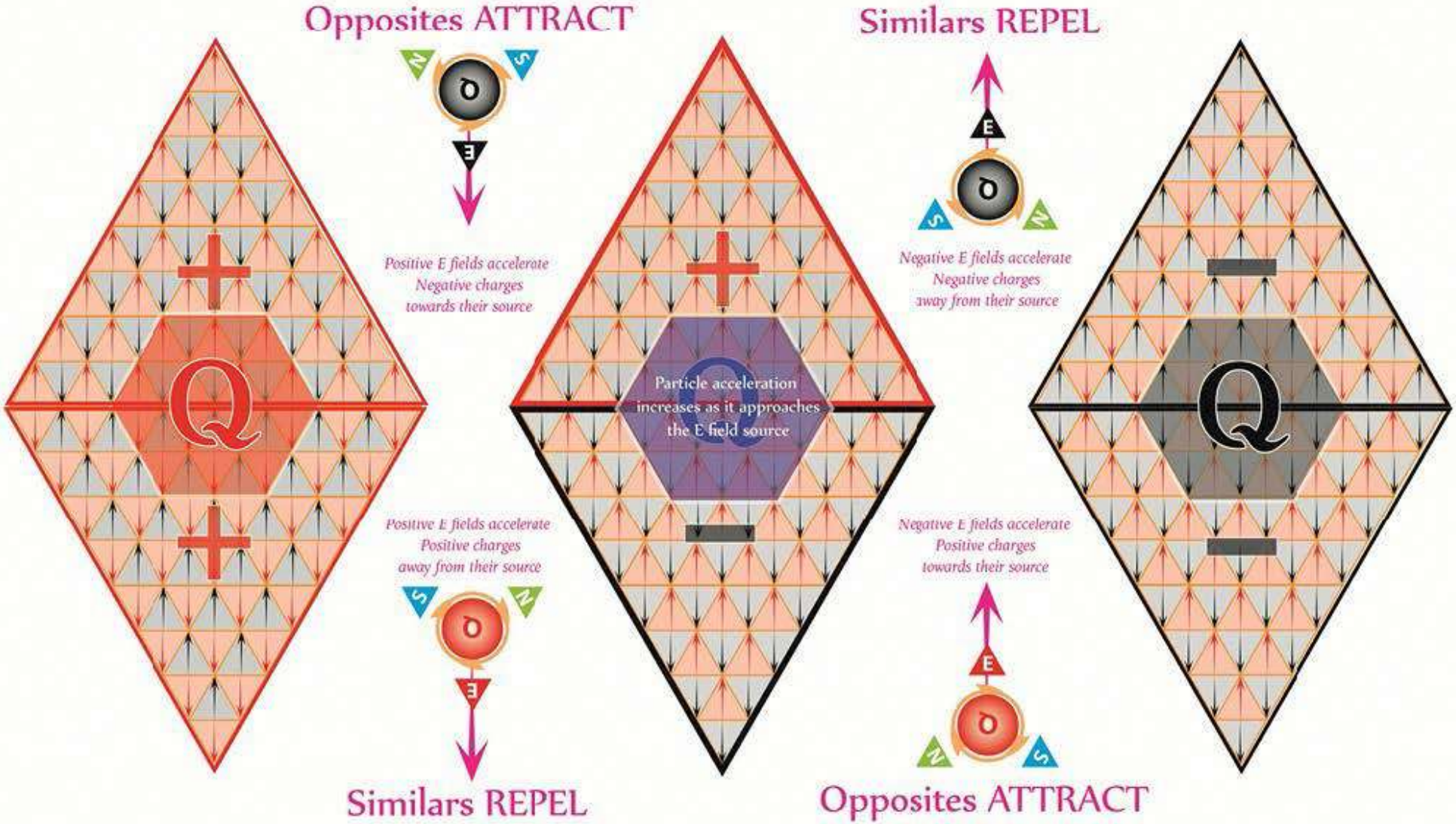
E field acceleration of charged particles

Electric fields can accelerate charged particles within their field geometry
dependent on the particle's nett charged mass-Matter topology



The charge quanta within Neutral particles are affected equally by Electric fields

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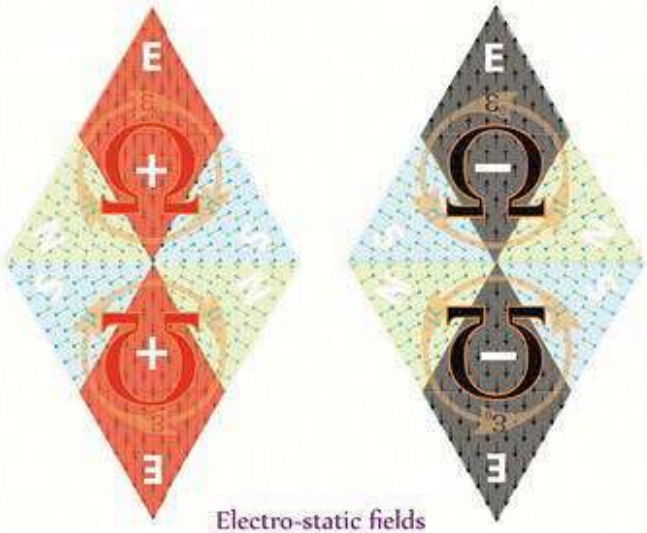
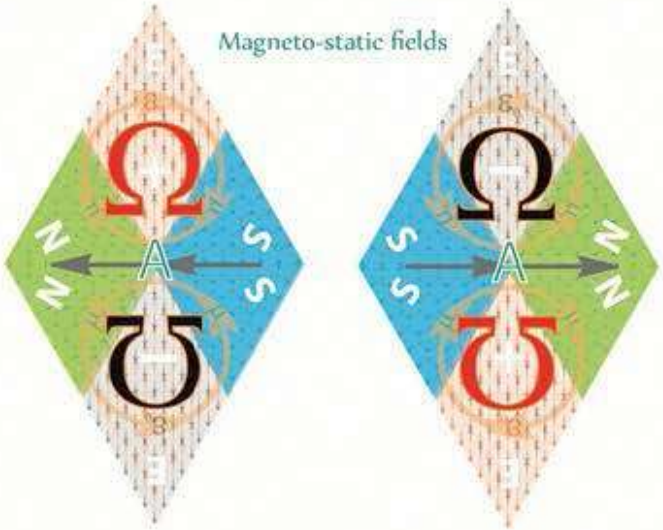
ZPFs can combine to form
4 distinct static EM fields



Electro-static fields

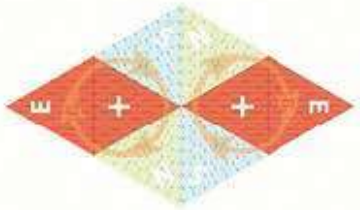
ElectroMagnetic fields



Similars REPEL
[QAM momenta vectors in opposition]

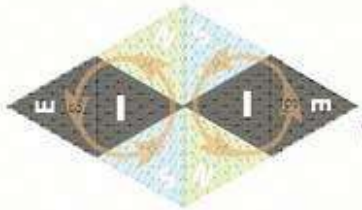
Opposites ATTRACT
[QAM momenta vectors in same direction]

'THE LAW OF INTERACTION'



Flux momenta in opposition

Electro-static fields
$1/r^2$



Flux momenta in the same direction

'FORCES OF INTERACTION'

Parallel

Flux momenta in the same direction

Magneto-static fields
$1/r^2$

Flux momenta in opposition

Anti-parallel

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Positive electrostatic fields

divergent positive momenta

convergent negative momenta

$$\mathbf{E} = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}\hat{\mathbf{r}}$$

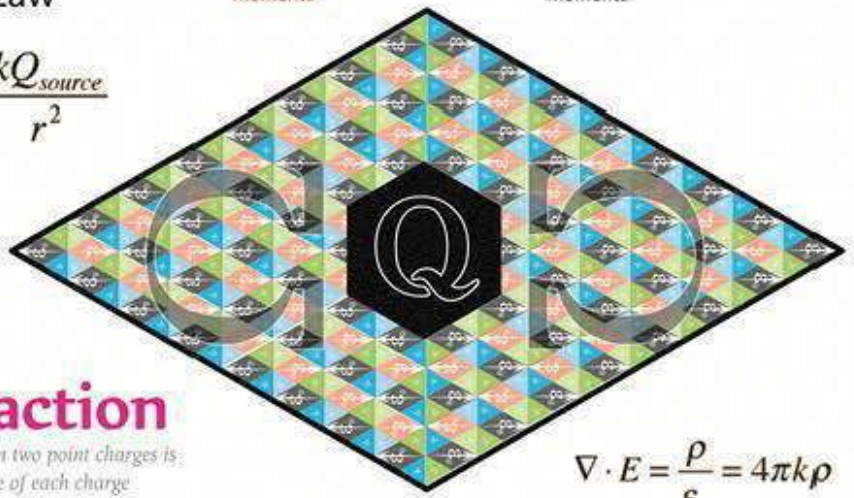
Coulomb's Force Law

$$E = \frac{F}{q} = \frac{kQ_{source}q}{qr^2} = \frac{kQ_{source}}{r^2}$$

Negative electrostatic fields

convergent positive momenta

divergent negative momenta



$$\nabla \cdot E = \frac{\rho}{\varepsilon_0} = 4\pi k\rho$$

Forces of Interaction

"The force of electrical attraction or repulsion between two point charges is directly proportional to the product of magnitude of each charge and inversely proportional to the square of distance between them"

attract Negative charged masses

repel Positive charged masses

attract Positive charged masses

repel Negative charged masses

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Electro-Magnetic field Lines

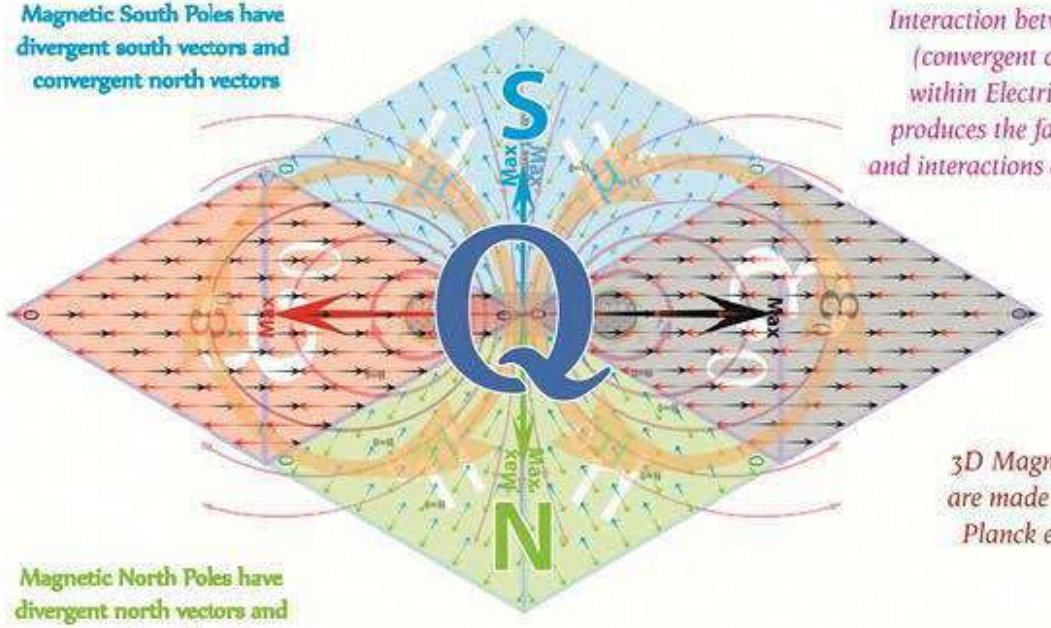
The magnetic field at any given point is specified by both its direction and magnitude

Magnetic dipoles can be produced by the coupling of opposite electric charge fields

or

by accelerating charged bodies of Matter which in turn produce associated Kinetic energies
[Neutral Electric field and equal strength Magnetic moment]

Magnetic South Poles have divergent south vectors and convergent north vectors



Magnetic North Poles have divergent north vectors and convergent south vectors

Interaction between vectorally opposed (convergent and divergent) vectors within Electric and Magnetic fields produces the familar lines of force and and interactions of Electro-Magnetic fields

3D Magnetic lines of Force are made up of 2D fields of Planck energy momenta

Every particle of Matter in motion possesses intrinsic Planck M-field dipoles becasue of their nett charged quanta which combine to produce a nuclear magneton.

The magnetic field lines of permanent bar magnets are the result of the equilateral charge [QAM] geometry of neutralised quanta that form their electrostatic fields

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Magnetic field Forces

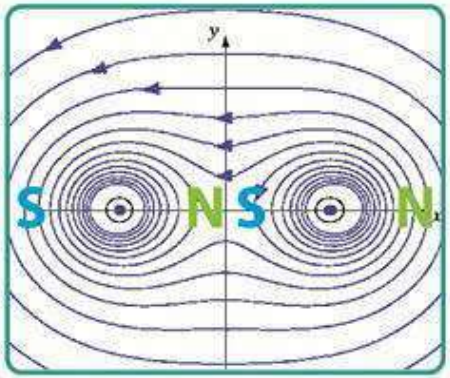
$$\frac{m^2 \cdot kg}{s^2 \cdot A^2} = \frac{J}{A^2} = \frac{Wb}{A} = \frac{s^2}{F} = \frac{V \cdot s}{A} = \frac{J/C \cdot s}{C/s} = \frac{J \cdot s^2}{C^2} = \frac{m^2 \cdot kg}{C^2}$$

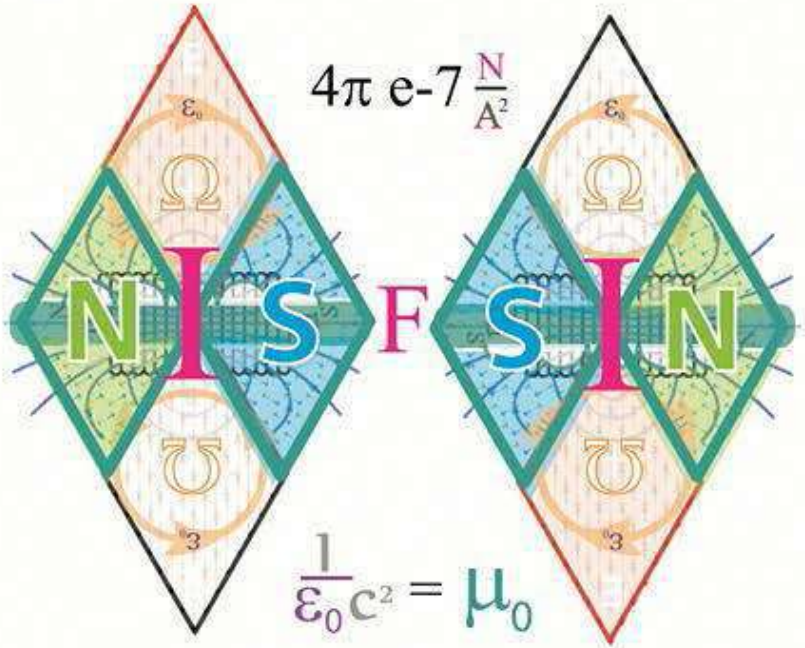
In physics superpositioned M fields with interactive energy momenta produce Lorentz forces

attractive magnetic forces

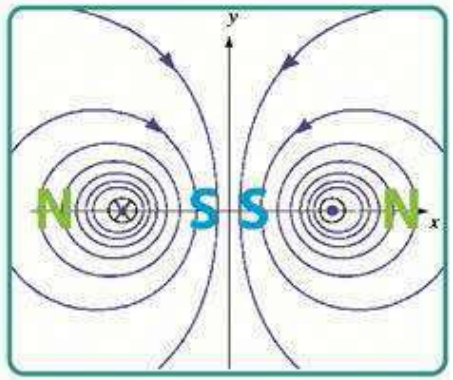
repulsive magnetic forces

Magnetic moments of same charges moving in the same direction





Magnetic moments of same charges moving in opposite directions



magnetostatic fields

$$\mathbf{H} = \frac{\mathbf{B}}{\mu_0}$$

Coupled opposite charge EM fields produce Magnetic dipole fields

Joseph Henry

(17 December 1797 – 13 May 1878)

μ_B

Electrostatic charged particles in motion create magnetic moments

kinetic EM fields

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Magnetic field lines

Magnetostatic Dipole

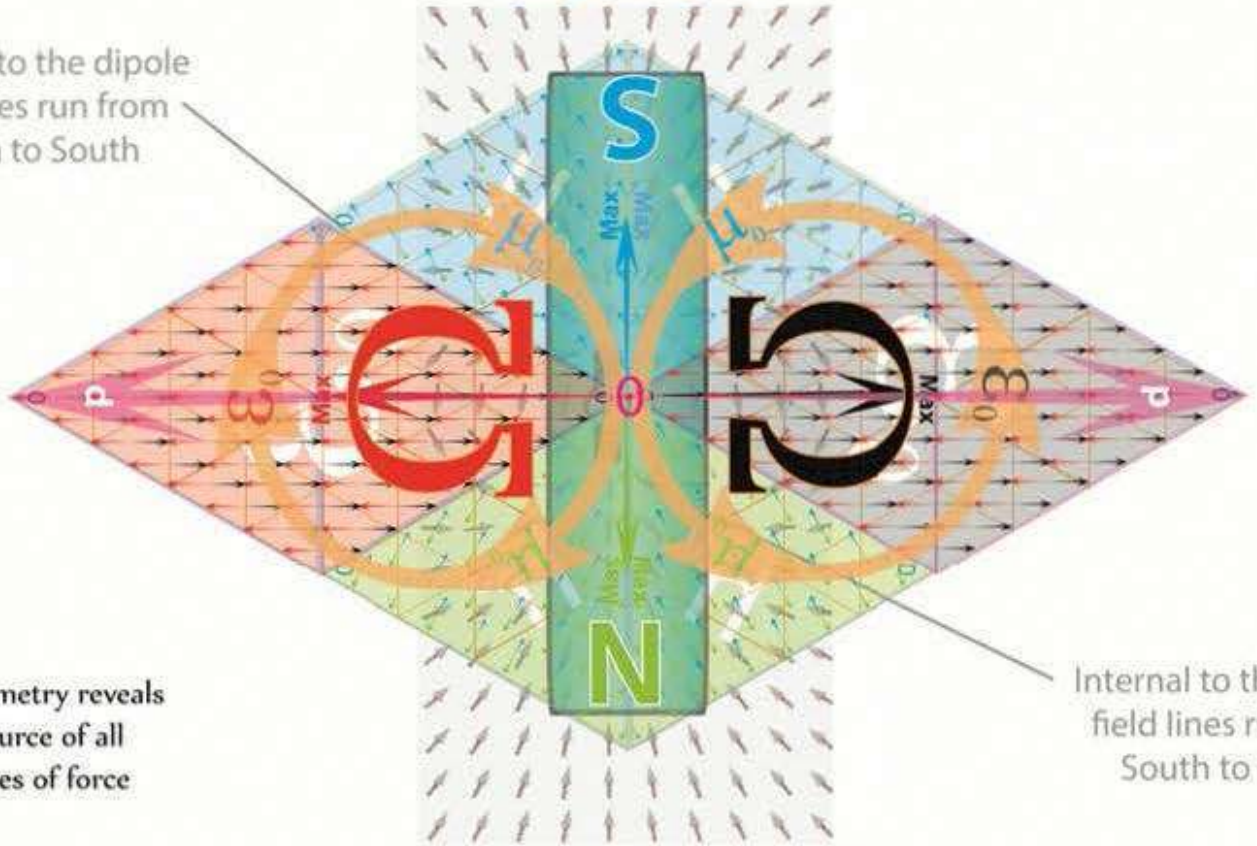
Magnetic field lines were introduced by Michael Faraday (1791-1867) who named them "lines of force"

Michael Faraday

(22 September 1791 – 25 August 1867)

Magnetic South Poles have divergent south vectors and convergent north vectors

External to the dipole field lines run from North to South



Positive Electric fields have divergent positive E vectors and convergent negative E vectors

Negative Electric fields have divergent negative E vectors and convergent positive E vectors

Tetryonic geometry reveals the true source of all EM field lines of force

Internal to the dipole field lines run from South to North

Magnetic North Poles have divergent north vectors and convergent south vectors

Permanent Magnets can be viewed as neutral charge Electrostatic EM fields

Similar to conventional vs electron current flows Magnetic field vectors can be modelled with two directions of 'magnetic flux'

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Parallel Magnetic Dipoles

Michael Faraday

(22 September 1791 – 25 August 1867)

James Clerk Maxwell

(13 June 1831 – 5 November 1879)

Magnetic lines of force are continuous and will always form closed loops.

Magnetic lines of force will never cross one another.

Parallel magnetic lines of force traveling in the same direction repel one another.

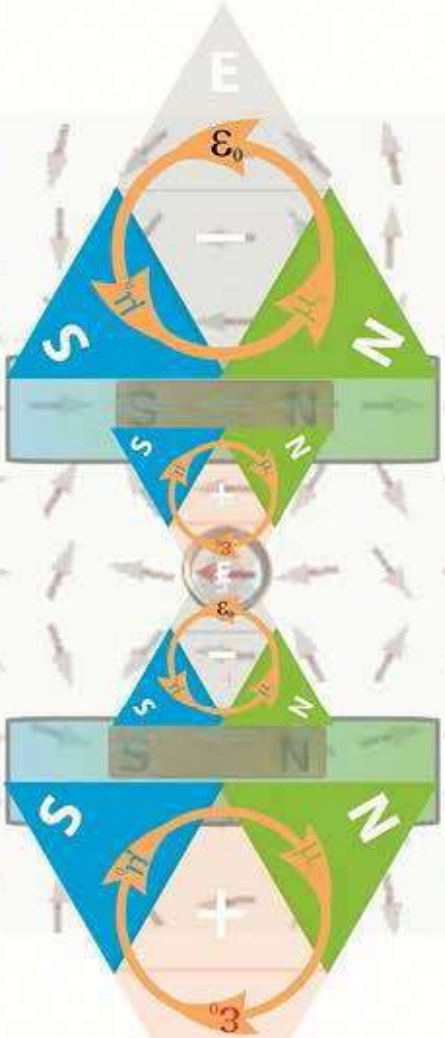
Parallel magnetic lines of force traveling in opposite directions tend to unite with each other and form into single lines traveling in a direction determined by the magnetic poles creating the lines of force.

Magnetic lines of force tend to shorten themselves.

Therefore, the magnetic lines of force existing between two unlike poles cause the poles to be pulled together.

Magnetic lines of force pass through all materials, both magnetic and nonmagnetic.

Magnetic lines of force always enter or leave a magnetic material at right angles to the surface



Maxwell had studied and commented on the field of electricity and magnetism as early as 1855/6 when "On Faraday's lines of force" was read to the Cambridge Philosophical Society.

The paper presented a simplified model of Faraday's work, and how the two phenomena were related. He reduced all of the current knowledge into a linked set of differential equations with 20 equations in 20 variables. [Quarterions]

This work was later published as "On physical lines of force" in March 1861.

In his 1864 paper "A dynamical theory of the electromagnetic field", Maxwell wrote, "The agreement of the results seems to show that light and magnetism are affections of the same substance, and that light is an electromagnetic disturbance propagated through the field according to electromagnetic laws

Maxwell showed that the equations predict the existence of waves of oscillating electric and magnetic fields that travel through empty space at a speed of 310,740,000 m/s.

His famous equations, in their modern form of four partial differential equations, first appeared in fully developed form in his textbook A Treatise on Electricity and Magnetism in 1873.

The specific features of Faraday's field concept, in its 'favourite' and most complete form, are that force is a substance, that it is the only substance and that all forces are interconvertible through various motions of the lines of force. These features of Faraday's 'favourite notion' were not carried on by Maxwell in his approach to the problem of finding a mathematical representation for the continuous transmission of electric and magnetic forces. Maxwell considered these electric and magnetic forces to be states of stress and strain in a mechanical aether, a notion further advanced by relativity theory with its 'stress energy' tensor math.

Tetryonics reveals lines of Force to be a direct result of the various superpositioned EM field geometries of equilateral mass-energy momenta

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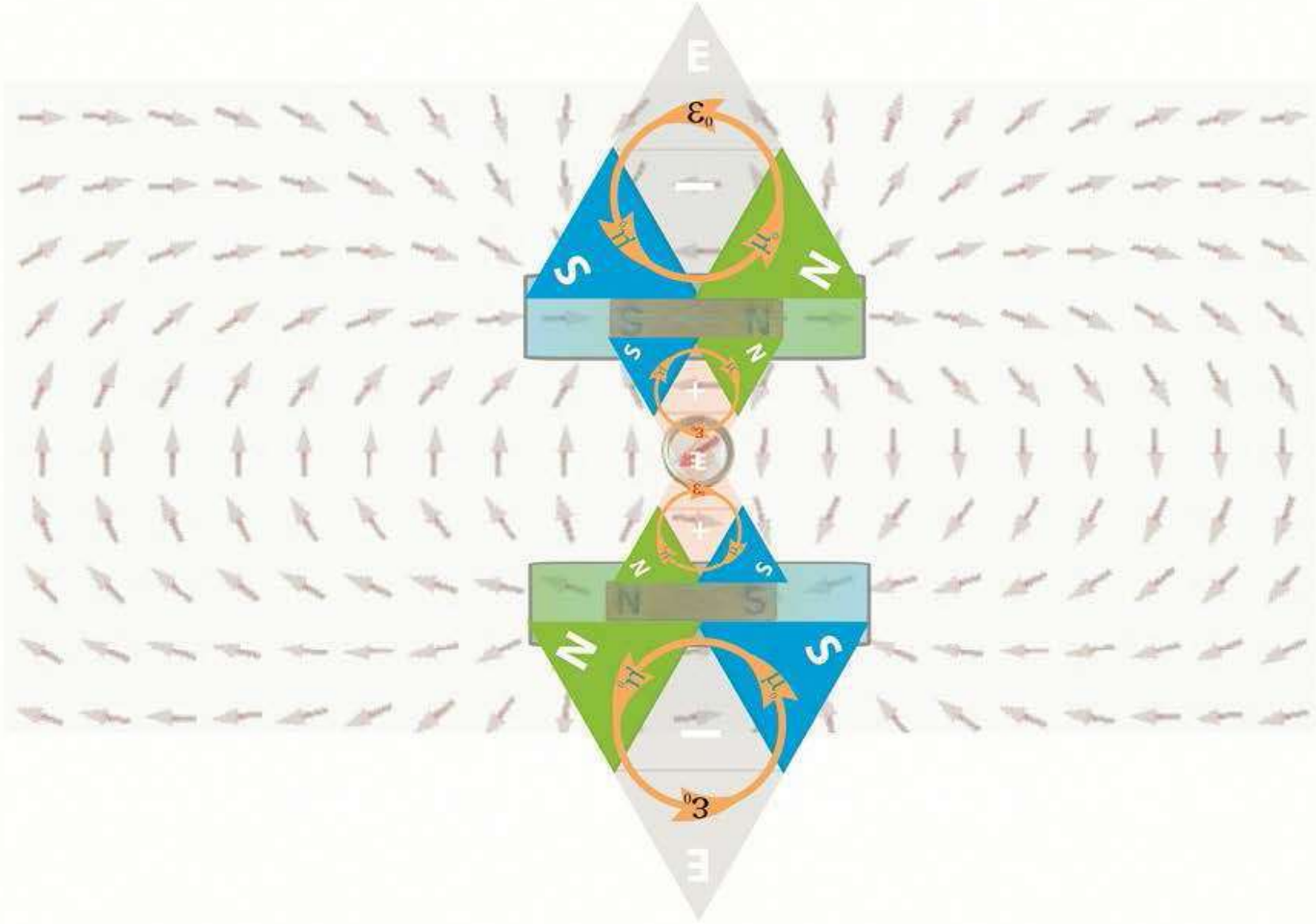
Anti-Parallel Magnetic Dipoles



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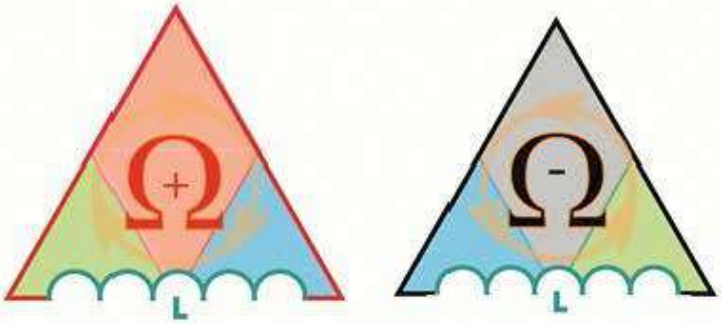
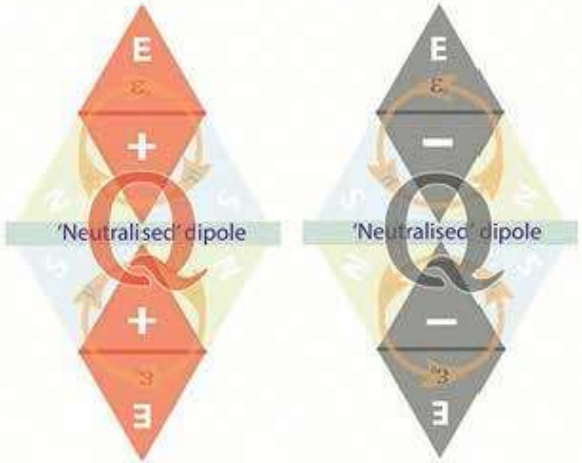
Magnetic Moments



Single ZPFs are
'ideal quantum inductor elements'

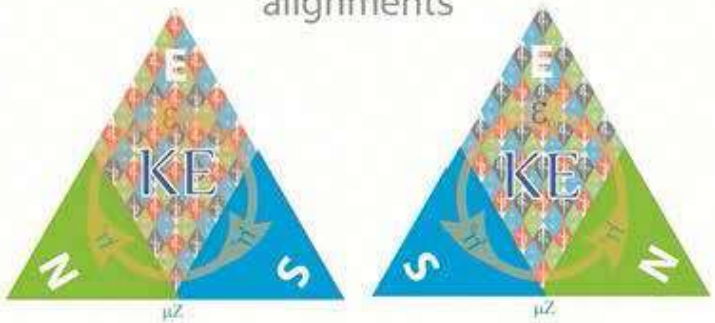
1
Electro-static Energies
Charges



All Matter in motion possesses kinetic energies
which are stored as Planck quanta in their KEM fields

The charge geometry of KEM fields are reflective
of the interactive component of the charged topology
of the particle in motion

Each charge geometry
has distinct Magnetic dipole
alignments



which in turn can only create
2 distinct orientations [spins] of
magnetic moments

2
Magneto-static Energies
Kinetic Energies

ZPF sets can form inductively coupled
quantum Harmonic Oscillators

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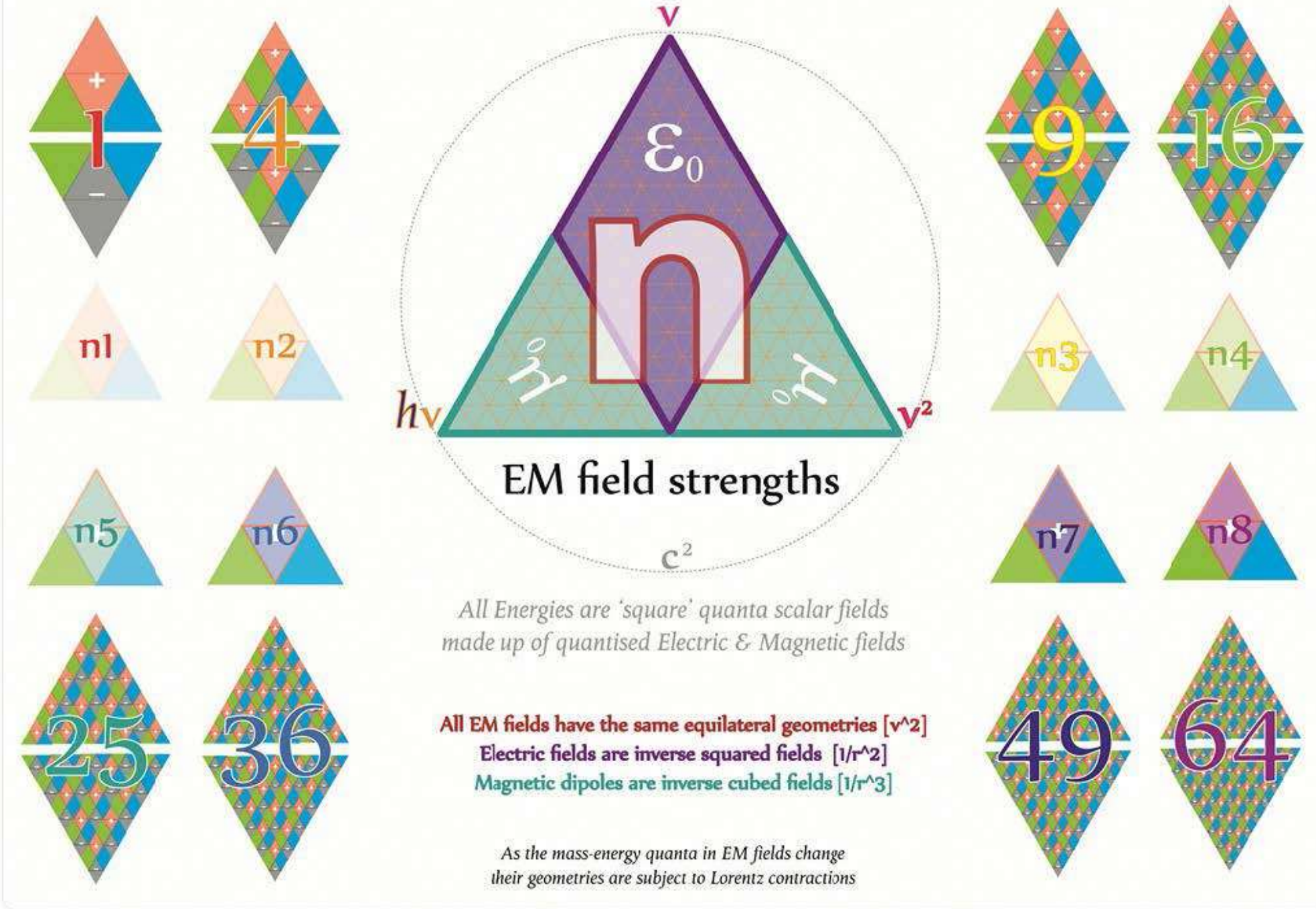

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Electrostatic particle modeling

m — EM mass-energy
Tetryonic field geometry

Tetryonic [4np] standing wave charge fields form electrostatic Particle topologies [Charged and Neutral Matter]

Matter
tetryonic Matter topology — **M**

Non-neutral nett Tetryonic quanta

3

12π geometries
12π topologies

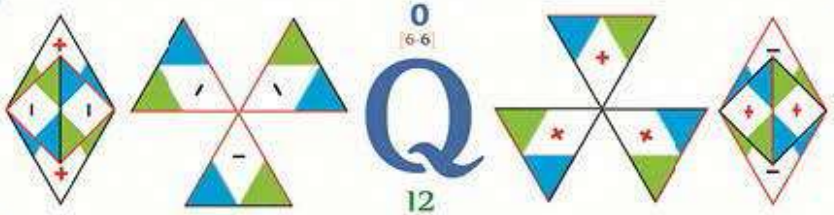
Positive Charge Particles

Equal numbers of opposite Tetryonic quanta

12π EM field geometries

3

12π particle topologies

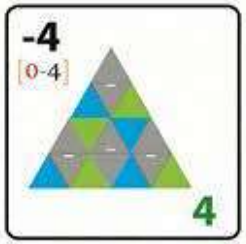


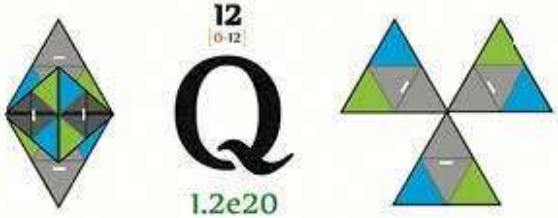
12π EM field geometries

3
12π particle topologies

Neutral Charge Particles

Non-neutral nett Tetryonic quanta

3 



12π geometries
12π topologies

Negative Charge Particles

All particles in motion create secondary KEM field geometries [Kinetic energies and Magnetic moments]

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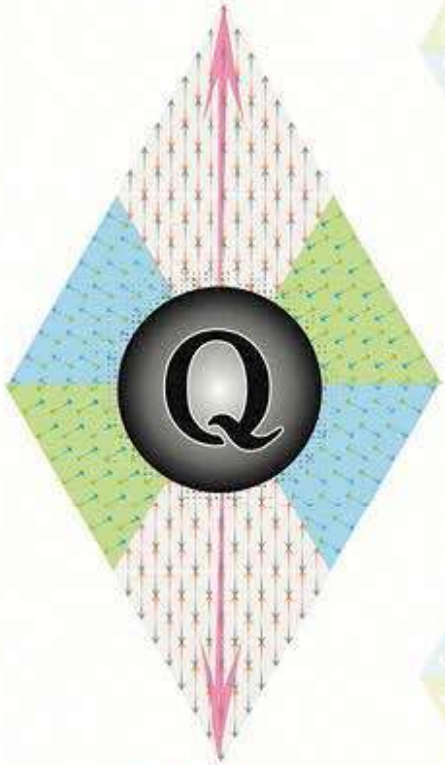
Electro-static Fields

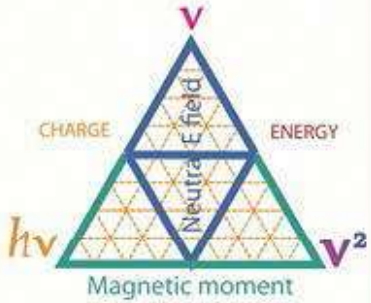
Momenta
acting in oppose directions
results in zero velocity



Zero Velocity
equates to
Zero nett Momentum

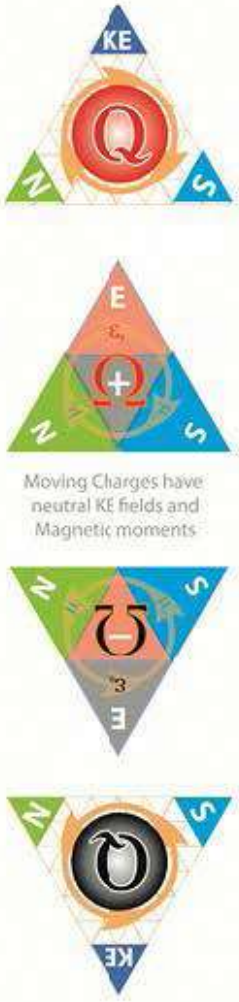
Stationary Charges
have neutralised
magnetic dipoles

The Kinetic Electric
& Magnetic energies
are contained in an
KEM field extending
from a charged
particle in motion



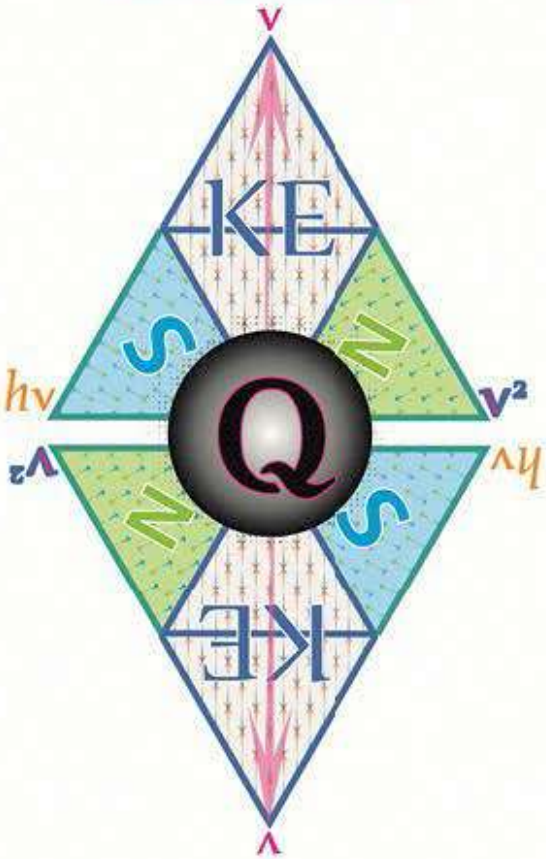
Charged particles
in motion produce a
Magnetic moment

Kinetic EM Fields



Moving Charges have
neutral KE fields and
Magnetic moments

Motion in any direction
produces
Kinetic & Magnetic energies



The Strength of the
Kinetic Electric field & Magnetic moment
is directly proportional to
the square of the particle's Velocity

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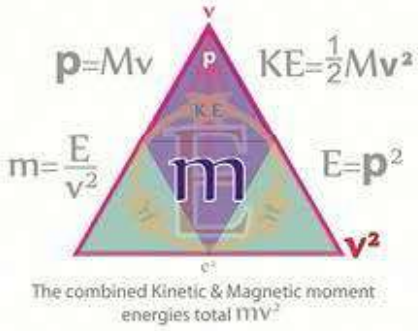
Electric & Kinetic Fields



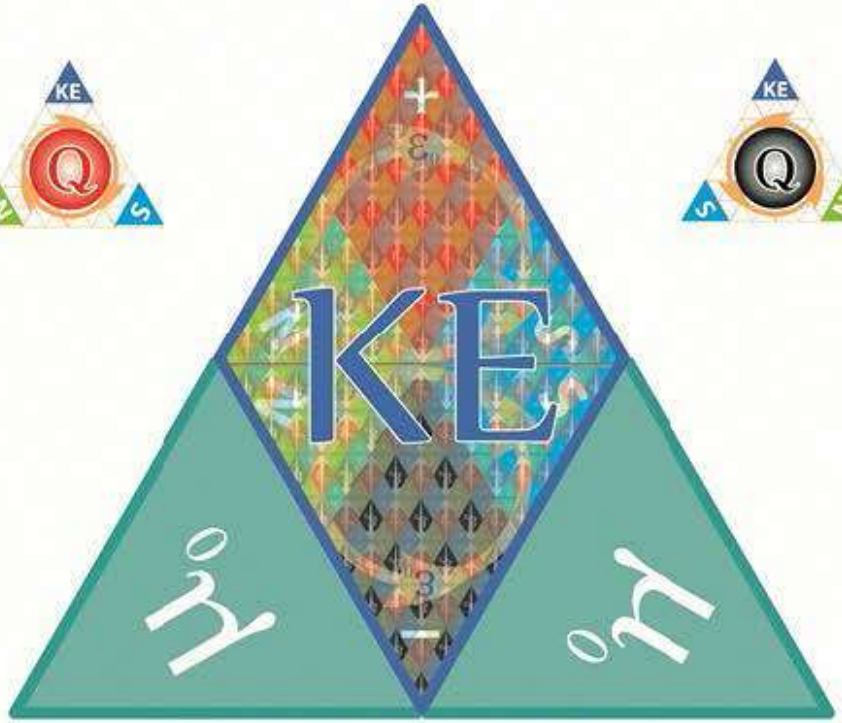
The combined Kinetic & Magnetic moment energies total mv^2

Kinetic Energy field

KEM field created by a Positive charged body

KEM field created by a Negative charged body

Positive charges repelled
Negative charges attracted



Neutralised Electric fields
Enhanced Magnetic moments

Negative charges repelled
Positive charges attracted

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EM & KEM force vectors

All mass-energy quanta are ideal quantum Inductors

The E&M force vectors create orthogonal equilateral EM Fields

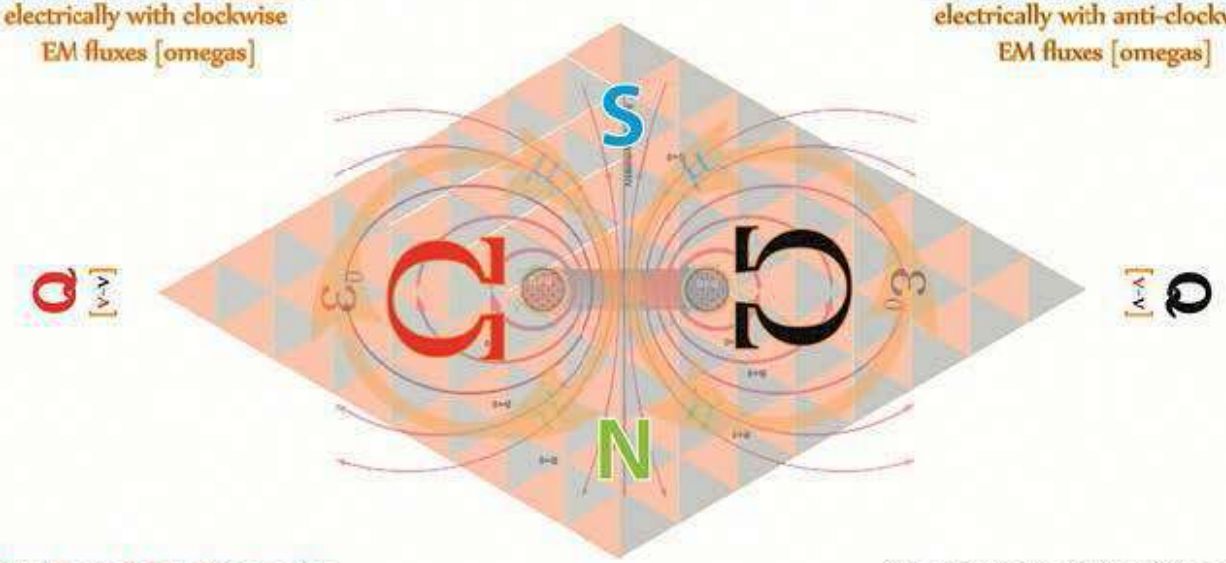
Electric fields propogate orthogonally to the Magnetic dipole field

Magnetic flux external to the Magnetic dipole flows from North to South
&
Internal to a Magnetic dipole it flows South to North

When ZPFs combine to form a Magnetostatic dipole they form orthagonal magnetic vectors

Positive charge can be modelled electrically with clockwise EM fluxes [omegas]

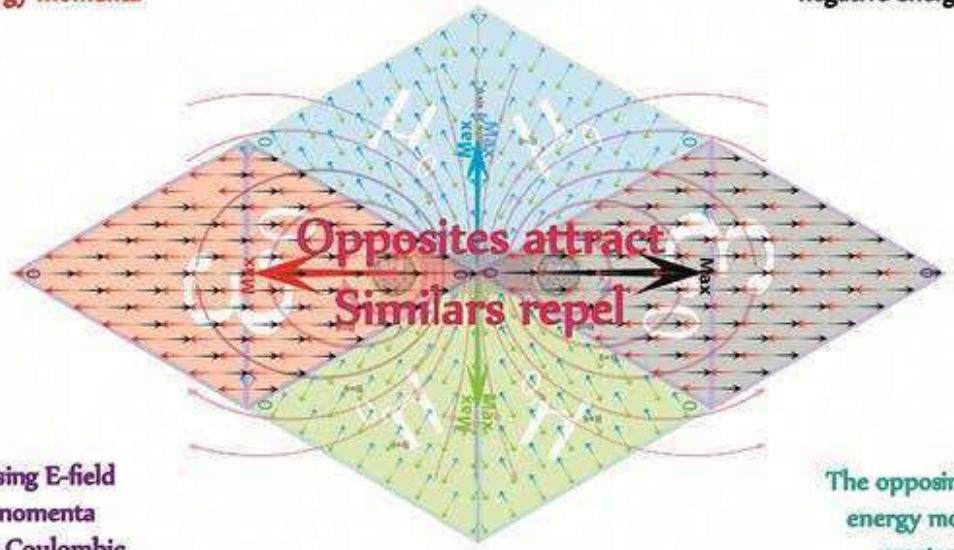
Negative charge can be modelled electrically with anti-clockwise EM fluxes [omegas]



Positive charge fields of interaction result from an excess of divergent positive energy momenta

Equal energy-momenta in opposition create static fields

Negative charge fields of interaction result from an excess of divergent negative energy momenta



The opposing E-field energy momenta creates the Coulombic Law of Interaction

When E field is at Maximum - B field is at Minimum
when B field is at Maximum - E field is at Minimum

The opposing M-field energy momenta creates the Lorentz Force

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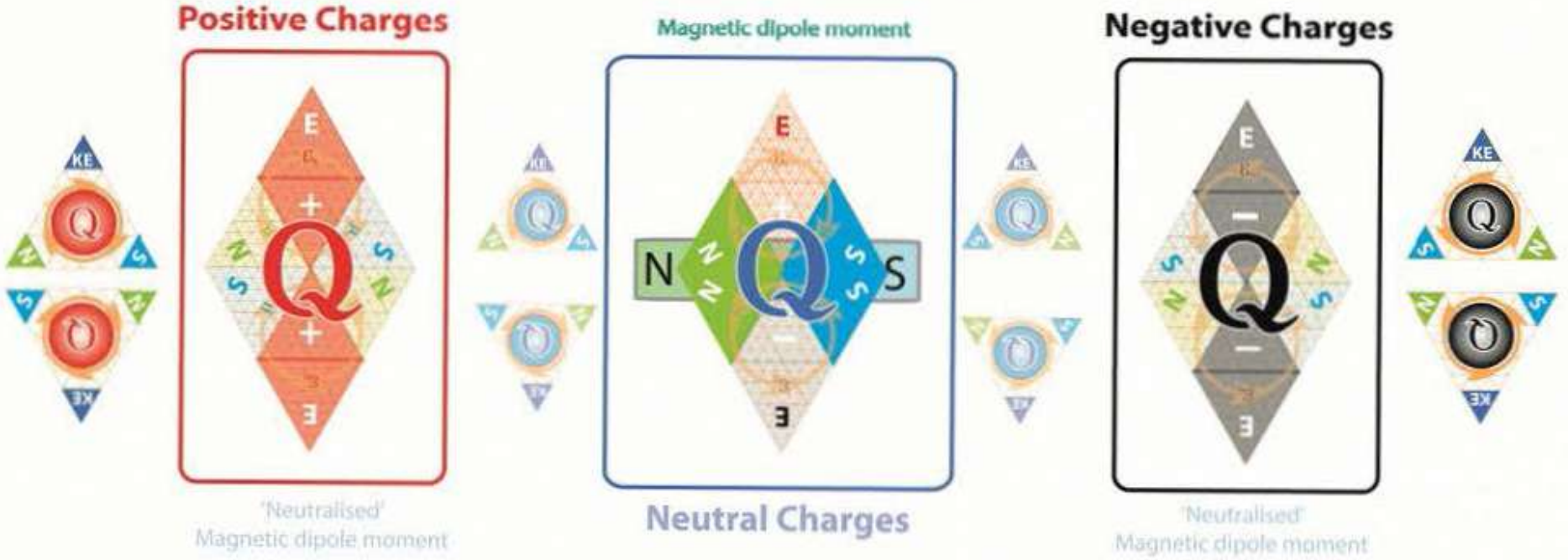
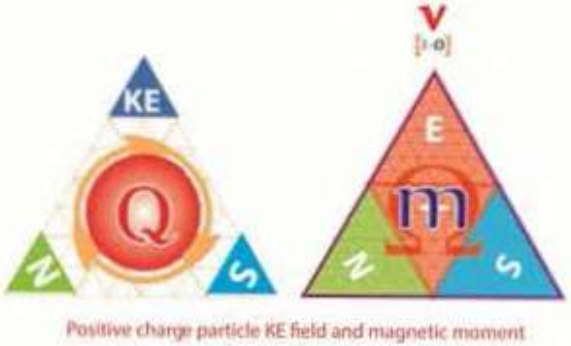
EM Forces and ZPFs

ZPF quanta can combine in differing combinations
to produce 3 distinct charged sets



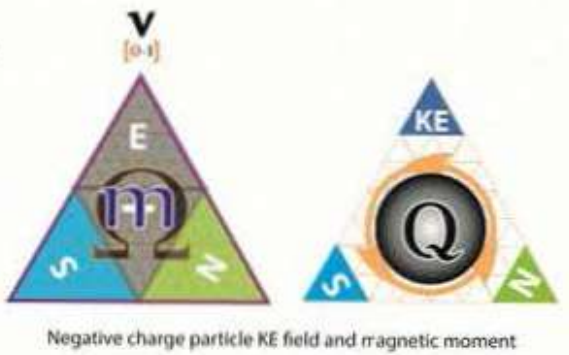
All EM mass-Energy-Matter & forces can be modelled using Tetryonic geometries



Positive charge particle KE field and magnetic moment

Zero Point Field EM geometry is the foundation for all the EM forces comprising, and acting between particles of Matter

Lorentz force, Lenz's Law, Right/Left Hand rules, etc can all be easily replaced with this simple geometric model



Negative charge particle KE field and magnetic moment

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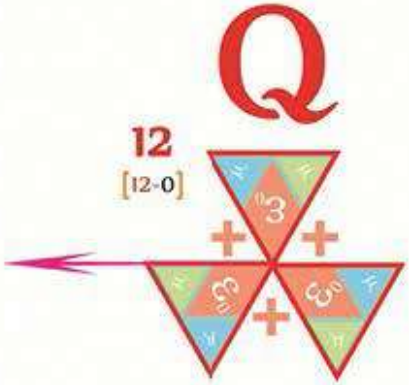
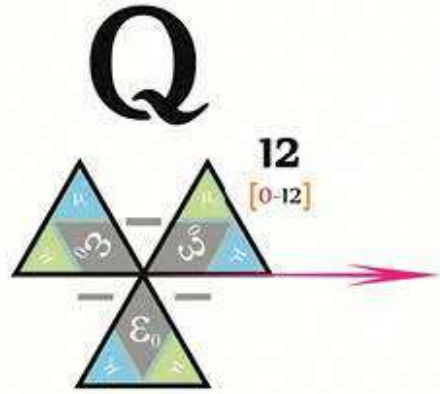
Kinetic EM fields

All Kinetic EM fields resulting from motion have charge field geometries resulting from the charged Matter geometry of the particle in motion

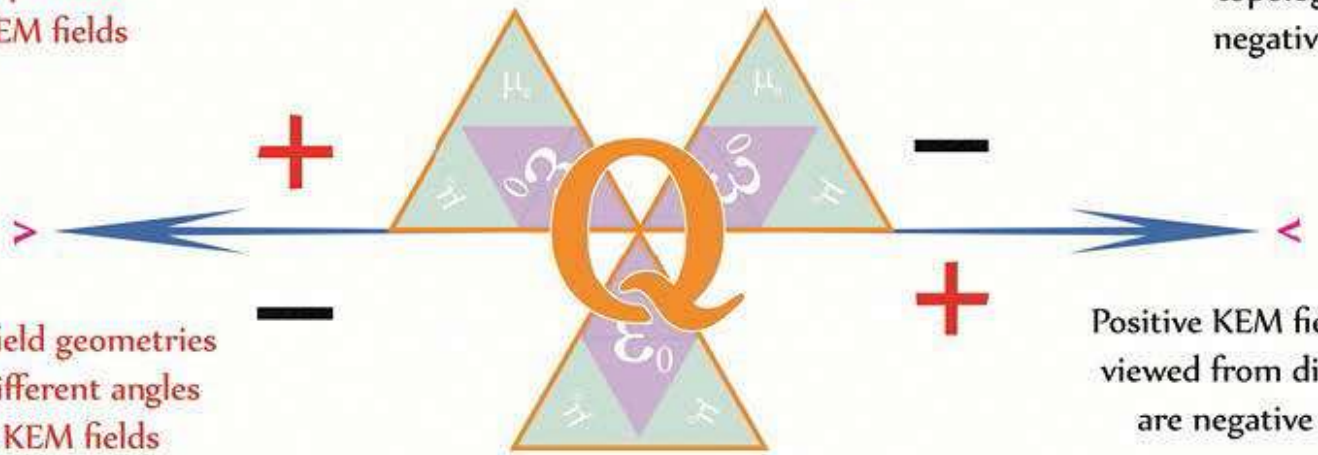


Positive charge particle topologies produce positive KEM fields

KEM field charge geometries do not contribute to the nett charge



Negative charge particle topologies produce negative KEM fields



Negative KEM field geometries viewed from different angles are positive KEM fields

Positive KEM field geometries viewed from different angles are negative KEM fields

As a direct result of the KEM field being a EM field permeating free space the symmetry of EM fields results in KEM field geometries being viewed as having neutral KE fields with a magnetic moment

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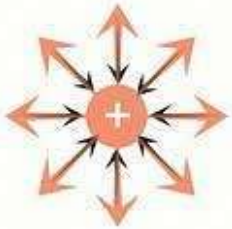
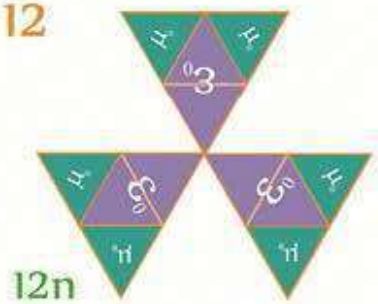
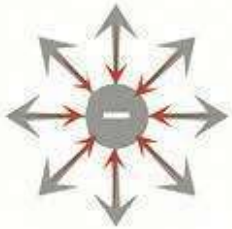
Point Particles and KEM fields



e+

12





e–

12

Charged rest mass-Matter topology

Quarks T[8π]
Leptons T[12π]

velocity invariant rest mass-Matter has a standing wave topology

Baryons T[20π]

Charged Leptons at rest are Electric field standing waves
(with neutral Magnetic poles)
KE from motion generates a Magnetic Moment

Bosons nπ [ODD]

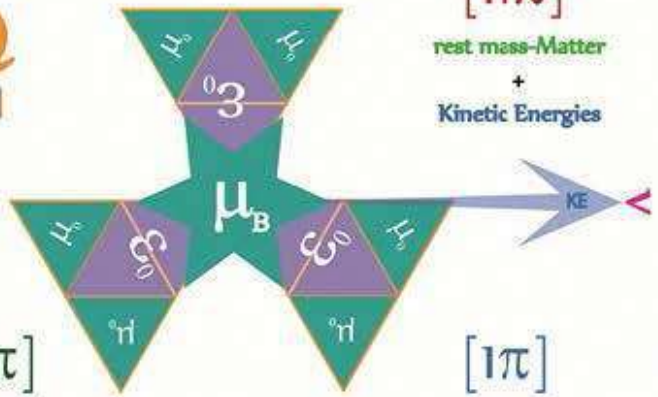
Kinetic EM field geometry is divergent from a particle's rest Matter topology

Photons nπ [EVEN]

Charge

Q

[v-v]



[nπ]

rest mass-Matter
+
Kinetic Energies

[12π]

rest Matter topology

[1π]

Kinetic Energy geometry

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KEM fields of Matter in motion

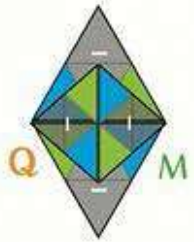
ZPFs geometries can be used to model the KEM fields of charged particles

2D charged EM field geometries create Matter topologies

tetryons [4π]	tetryons [4π]
quarks [12π]	quarks [8π]
leptons [12π]	leptons [12π]
Baryons [36π]	Baryons [20π]
Elements [84π]	Elements [54π]

The mass-energy content of all charged fascia constituting massive particles have momenta that is proportional to the intrinsic velocity [c] of the standing wave

rest Matter



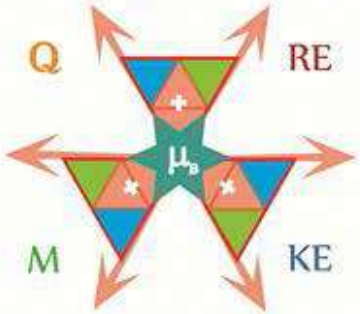
Electro-static particles have neutralised magnetic dipoles

Relativistic mass

Kinetic motion produces Magnetic moments

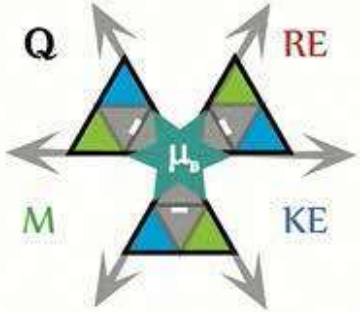
Spherical point charges do NOT exist

positron

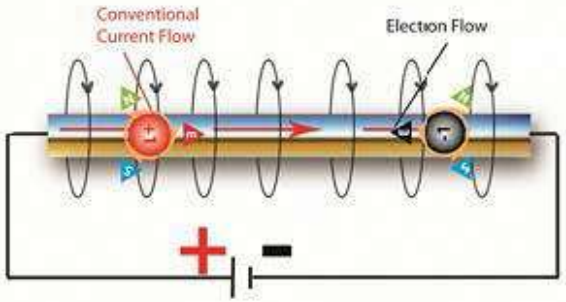


3D Matter is a standing-wave topology resulting from radiant 2D EM geometries
All leptons and quarks both have 12 charged fasica geometries,
[but differing mass-Matter-particle topologies]

electron

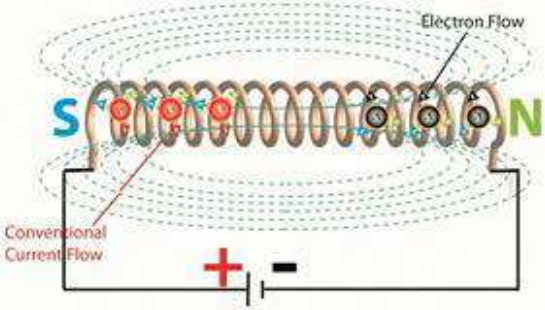


All EM fields resulting from Kinetic Energy (motion) radiate outwards
(the Intrinsic KEM fields contain both Negative and Positive Energy momenta quanta)



Magnetic field around a current carrying conductor

Magnetic field produced by a Solenoid



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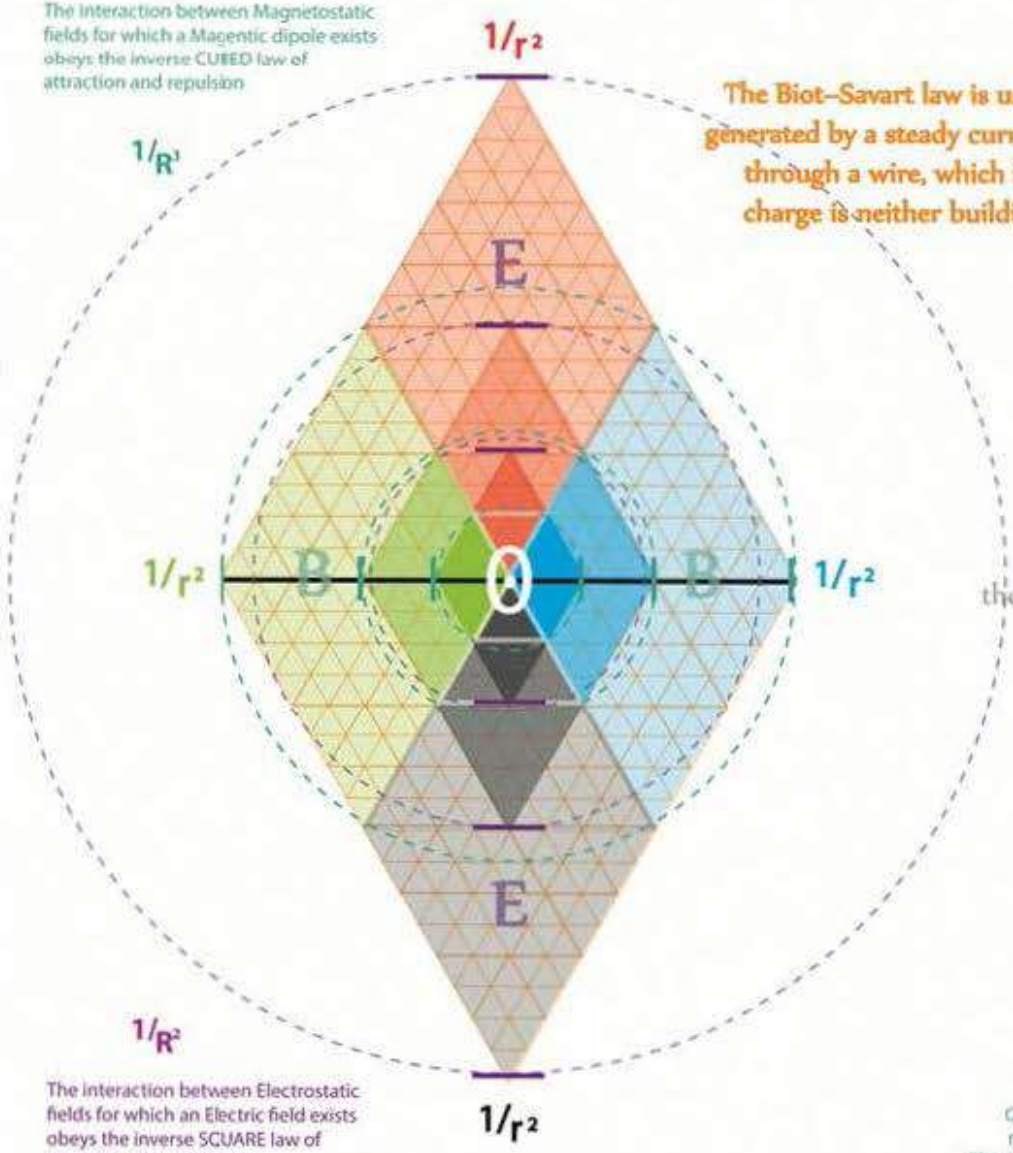
μ_0 There is an inverse cube relationship between magnetic field strength and magnetic field force with respect to distance from the magnet. ε_0

Biot-Savart Law

is an equation in electromagnetism that describes the magnetic field B generated by an electric current.

The interaction between Magnetostatic fields for which a Magentic dipole exists obeys the inverse CUBED law of attraction and repulsion



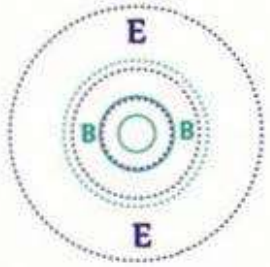
The interaction between Electrostatic fields for which an Electric field exists obeys the inverse SQUARE law of attraction and repulsion

The Biot–Savart law is used to compute the magnetic field generated by a steady current, i.e. a continual flow of charges, through a wire, which is constant in time and in which charge is neither building up nor depleting at any point

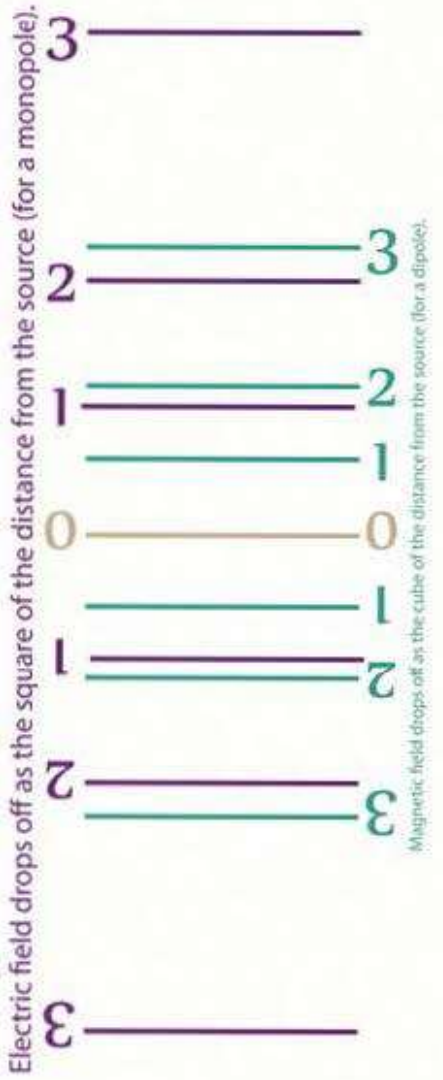
$$\mathbf{B} = \int \frac{\mu_0}{4\pi} \frac{I d\mathbf{l} \times \mathbf{r}}{|r|^3},$$

The radial distance between Magnetic dipoles is less than the distance between Electric dipoles

$$\mathbf{B} = \int \frac{\mu_0}{4\pi} \frac{I d\mathbf{l} \times \hat{\mathbf{r}}}{|r|^2},$$



Close to one pole of a magnet, B field strength resembles the inverse square of Electric force. This is because it behaves as a "unipolar magnetic field"



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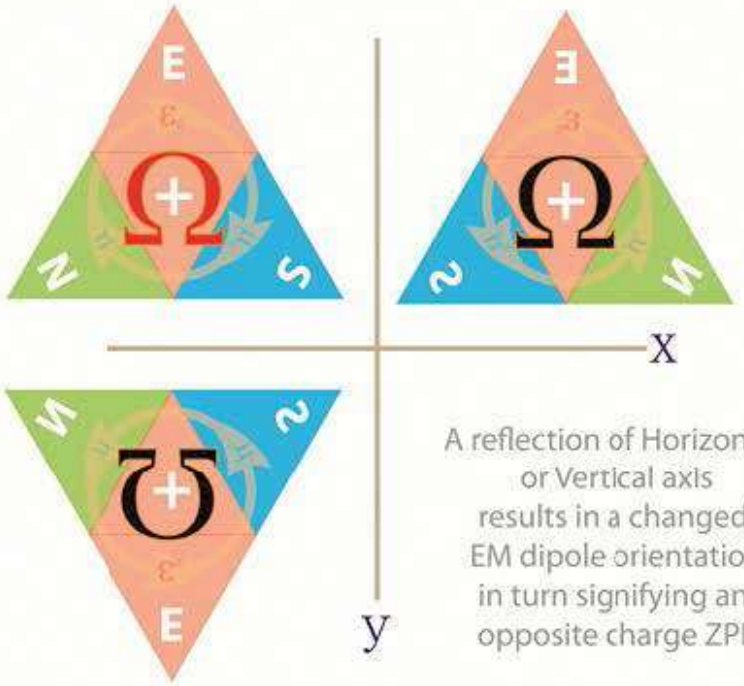
Quantum Chirality

Its the equilateral geometry of quantised angular momenta that creates chirality in physics

Mirror imaged Planck quanta are NOT identical to each other



A reflection of Horizontal or Vertical axis results in a changed EM dipole orientation in turn signifying an opposite charge ZPF

The equilateral geometry of any EM field or Matter particle is determined by its nett Coulombic charge

Any nominal rotation about an axis results in a re-orientation of the electromagnetic vectors but does not affect any change to charge etc.

Irrespective of orientation or rotation:

Positive charge fields have clockwise inductive flux geometries

Negative charge fields have counter-clockwise inductive flux geometries

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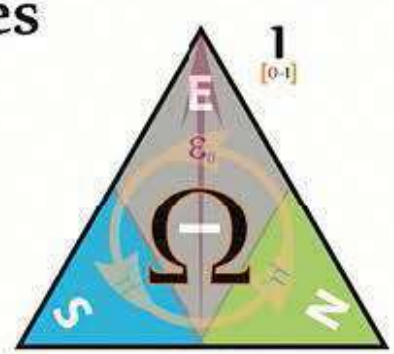
Pi radian - energy momenta geometries

mass-energy momenta

Q

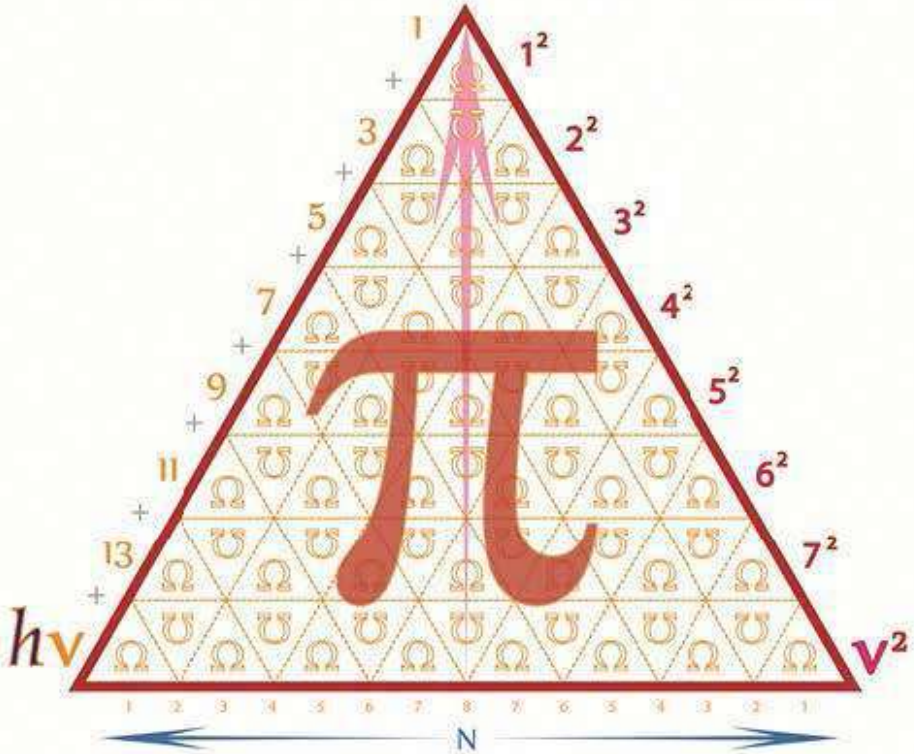
nett charge

[v-v]



π

pi radian energy geometries



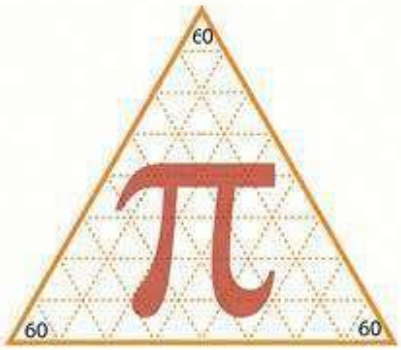
Ω

quantised angular momentum

$$n\pi\left[m\Omega v\right]^2$$

Planck quanta

energy — mass — velocity



π radian geometries are comprised of equilateral mass momenta Ω

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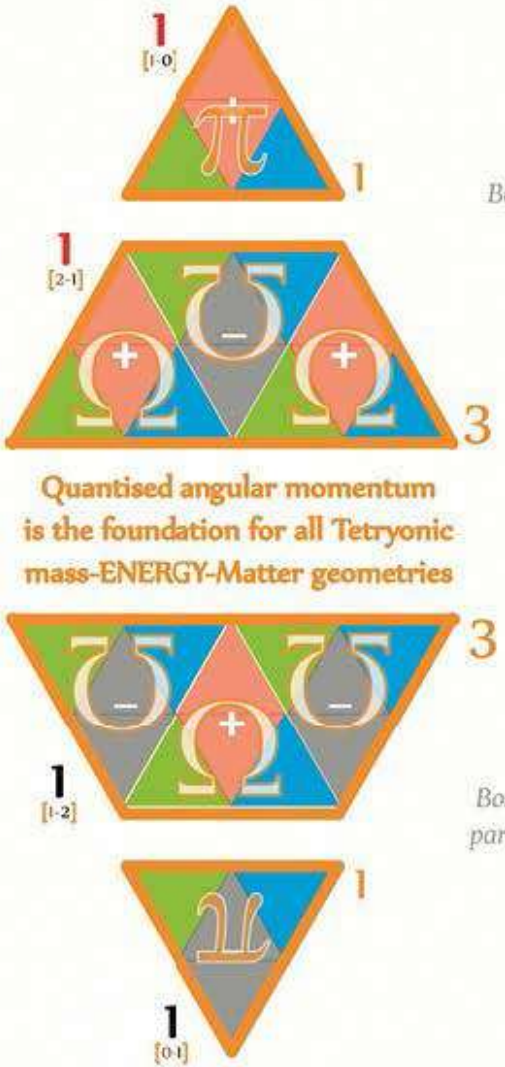
ZPFs and Bosons

ZPFs are Planck energy quantum elements



Bosons are transverse Quantum levels

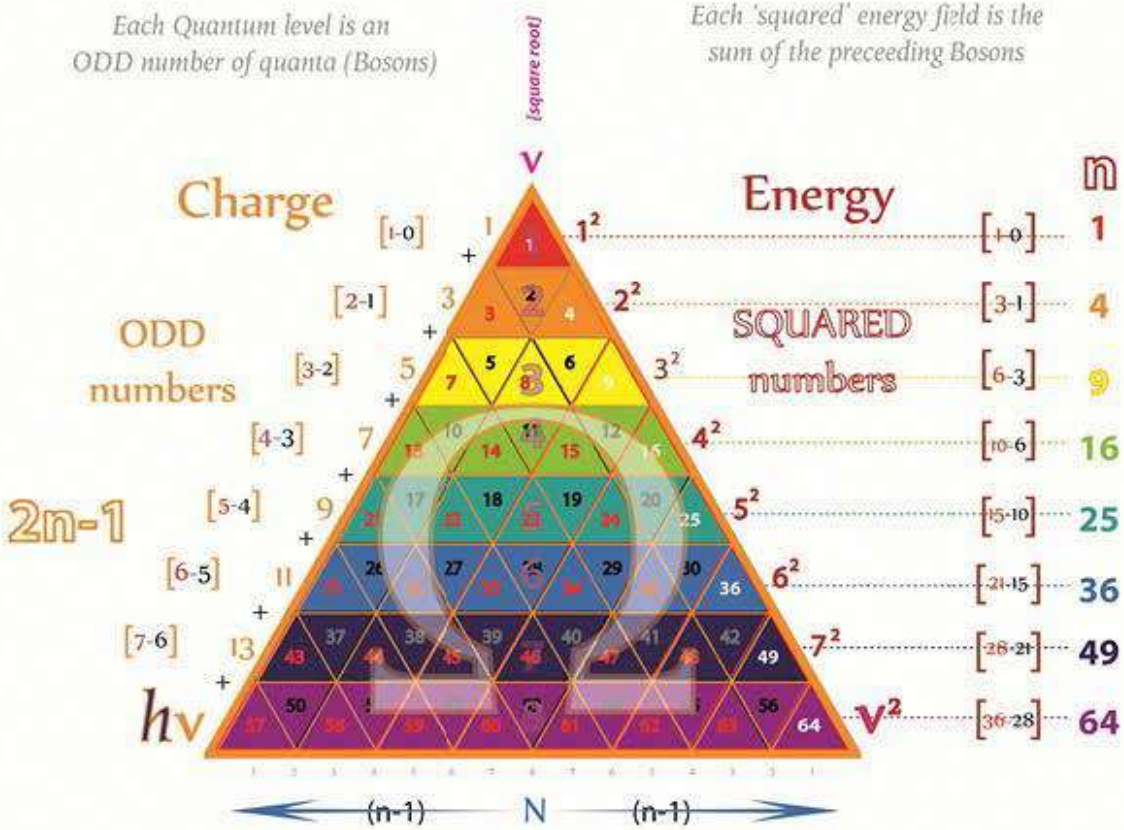
Quantised angular momentum is the foundation for all Tetryonic mass-ENERGY-Matter geometries

Bosons are the exchange particles for the EM force

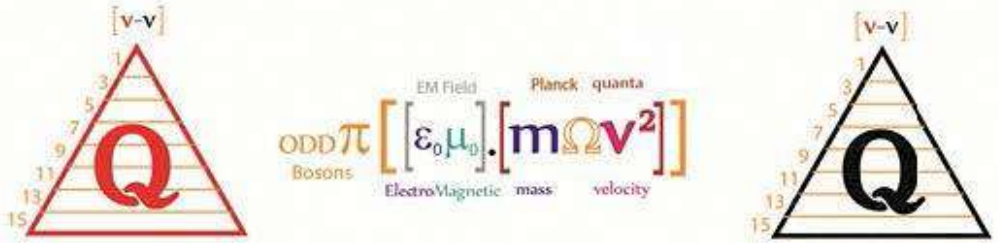
ZPFs are the quanta geometry for Charge. Bosons and Energy

Each Quantum level is an ODD number of quanta (Bosons)

Each 'squared' energy field is the sum of the preceeding Bosons



The charged quanta in all mass-Energy geometries create a NORMAL Distributions



Bosons form the geometry of Quantum Levels

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$$W^{+} = n\pi_{ODD}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Force carrier for Positive charge particles

W^{+} Boson

$$ODD\ Bosons\ \pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM field (ElectroMagnetic) · Planck quanta (mass, velocity)

CHARGE carrier Bosons
are ODD number quanta

Bosons
form unit charge Quantum levels
that facilitate EM induction between
mass-Energy-Matter

Neutral Z Bosons and Photons
are EVEN quanta Bosons

$$EVEN\ Photons\ \pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

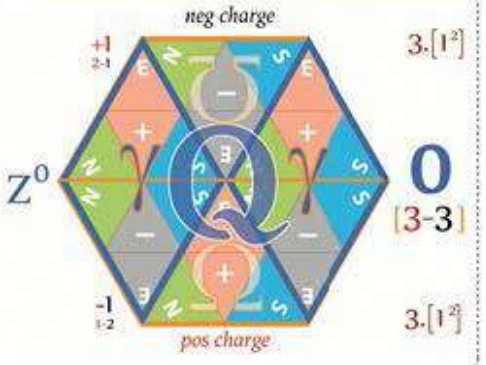
EMField (ElectroMagnetic) · Planck quanta (mass, velocity)

Neutral charge parallelogram geometry EM force carriers

Z^0 Boson

Neutral Z Bosons can be formed by combining EVEN numbers of W Bosons

They are EVEN numbered alternate geometry Photons



Photons are alternate (diamond) EM geometries formed from Z Bosons

W^{-} Boson

Force carrier for Negative charge particles

$$W^{-} = n\pi_{ODD}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

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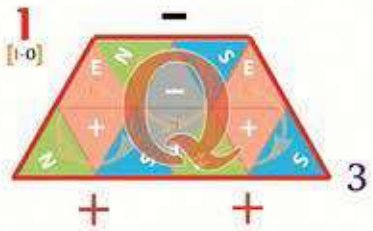
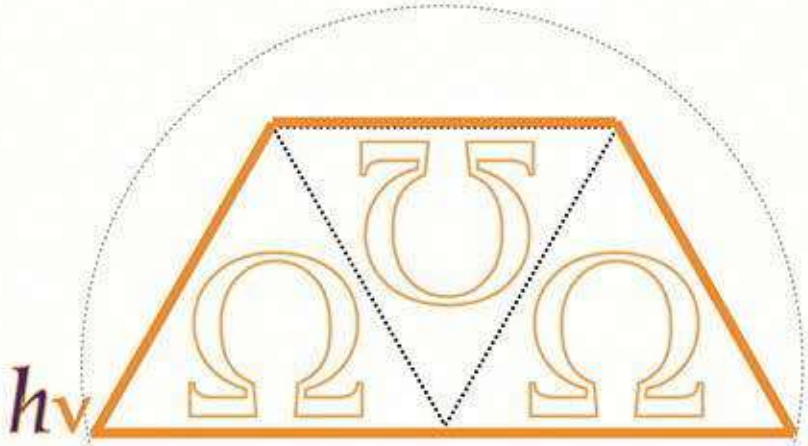
Bosons are charge carriers

[the geometric foundation of quantum levels]

W+ Positive charge carrier





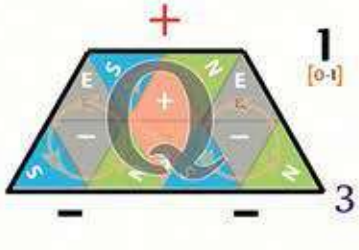
hv =1,3,5,7,9,11,13,15,17,19,21, ...

$$E = n.hv$$

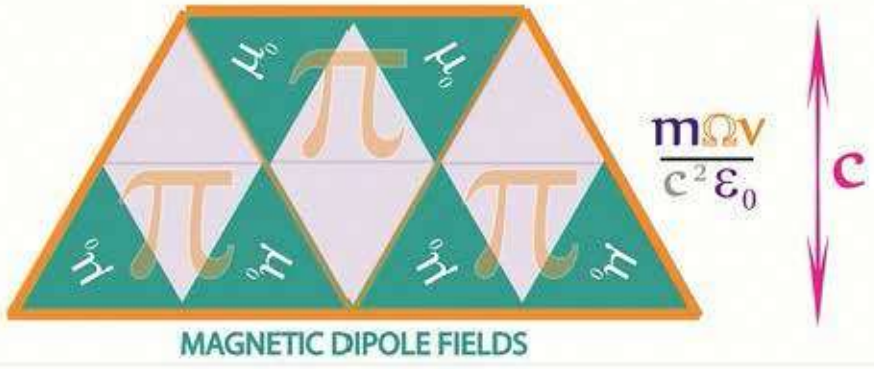
Planck's Heat Law

c^2

Negative charge carrier W−



All Bosons have ODD quanta trapazoidal charged EM mass-energy geometries



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Boson Frequencies

All Bosons are 1/2 wavelength EM fields with ODD number quanta
They are the geometric basis for transverse EM field Quantum levels

ODD Bosons $\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

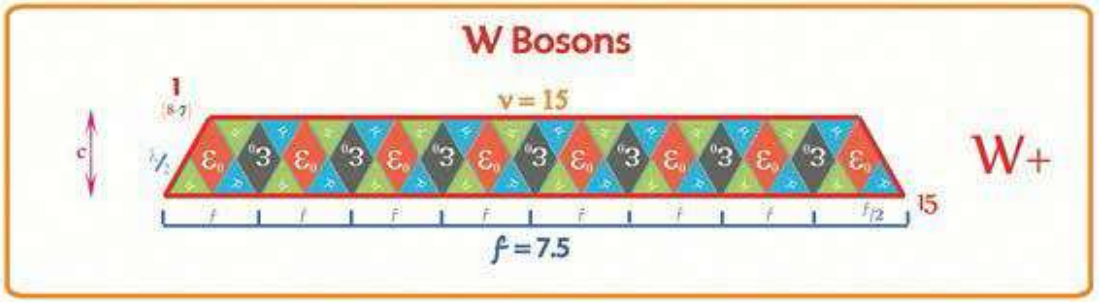
W Bosons are comprised of ODD number quanta

Bosons are TRANSVERSE Charge carriers

ODD #

Q

Planck quanta $n\pi\left[\left[m\Omega v^2\right]\right]$ (mass; velocity)

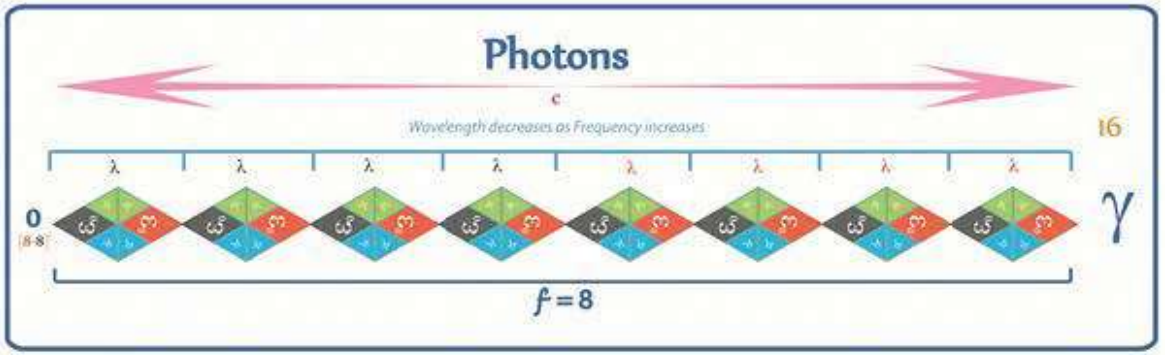


Neutral Z BOSONS and PHOTONS have differing EM geometries

EVEN #

Q

Planck quanta $2n\pi\left[\left[m\Omega v^2\right]\right]$ (mass; velocity)

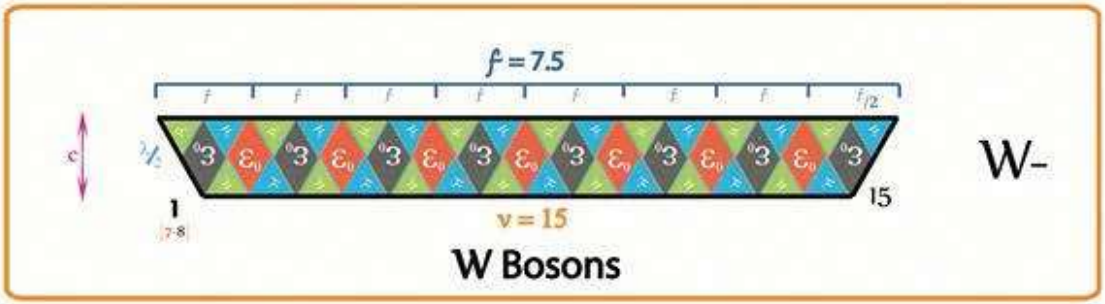


Photons are LONGITUDINAL neutral EM force carriers resulting from Bosons

ODD #

Q

Planck quanta $n\pi\left[\left[m\Omega v^2\right]\right]$ (mass; velocity)



EM waves are comprised of EVEN number quanta [Photons]

EVEN EM waves $\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

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Boson Waveforms

W The Electro-weak force is the result of Bosons interacting along their edge of Permeability

Boson exchange is the basis of Electro-Magnetic Induction & Charge transfer

S The Strong Colour Force is the result of Bosons interacting via their their Electric charge fascia

All ODD Ω geometries [bosons] create a quantum of charge

Positive charge carrier

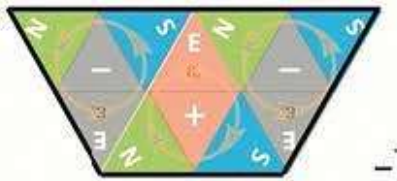
+1

W+ ODD number quanta

All charges are comprised of odd numbered Bosons

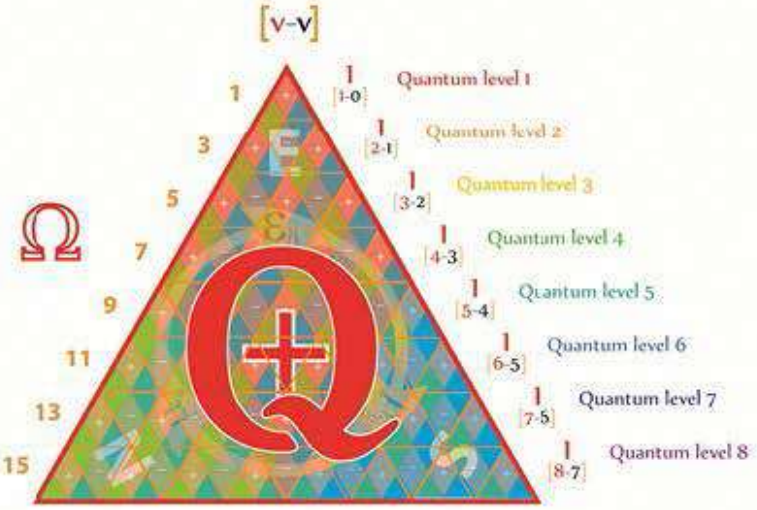
[each Boson is a Quantum level]

ODD number quanta



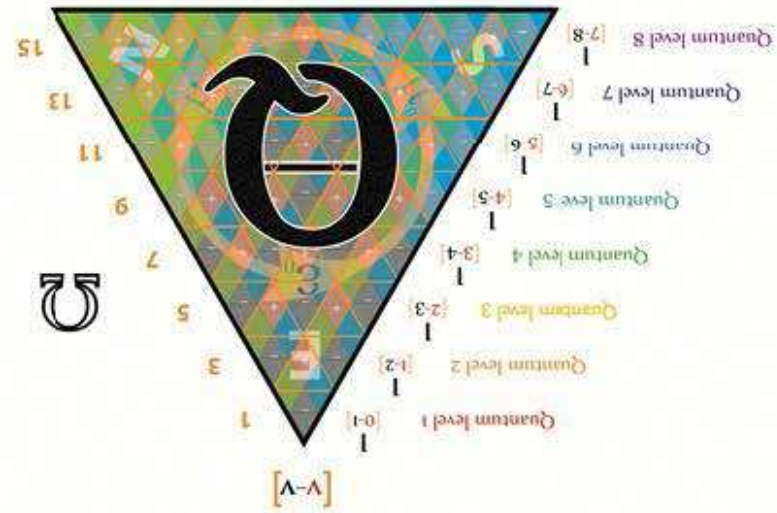
W− -1

Negative charge carrier



Integral W Bosons form square Energy geometries

Separated energy geometries create an electromotive force



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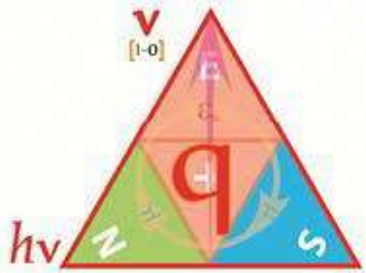
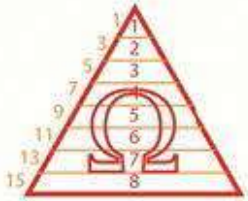
Bosons



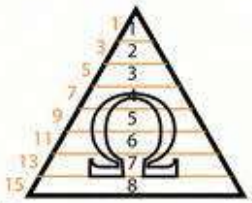
Positive Charges have nett
positive quantised angular momenta

Positive Bosons



$$\text{ODD}\,\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

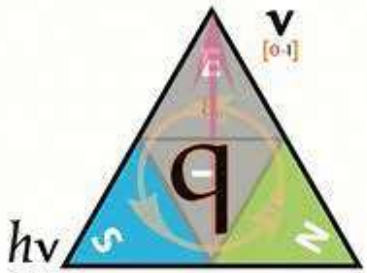
EM Field · Planck quanta · Bosons · ElectroMagnetic · mass · velocity



Bosons are the geometry of Quantum Levels

Negative Bosons

Negative Charges have nett
negative quantised angular momenta

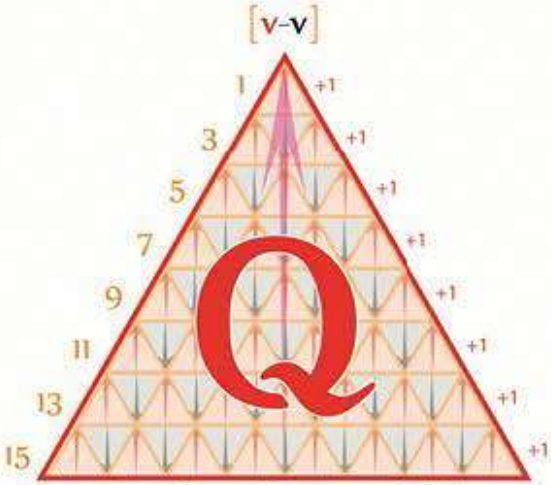


Bosons are
TRANSVERSE
EM fields [levels]

nett Charge
is a SCALAR
EM field property

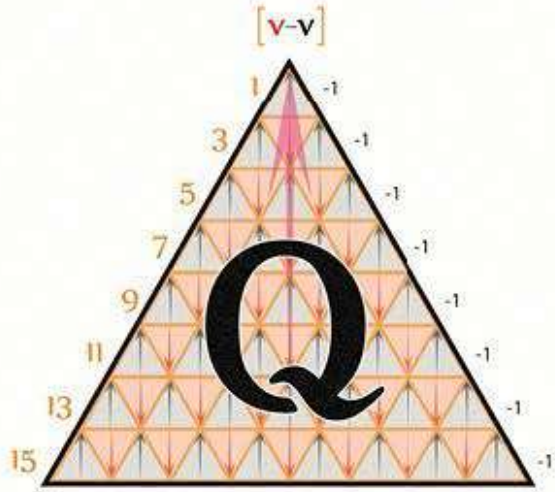
Each quantum Level is
a unit of Charge

Charge



Positive Charge field

Charge is a measure of the nett quantised angular momenta - energy geometry of any given region of Space-time



Negative Charge field

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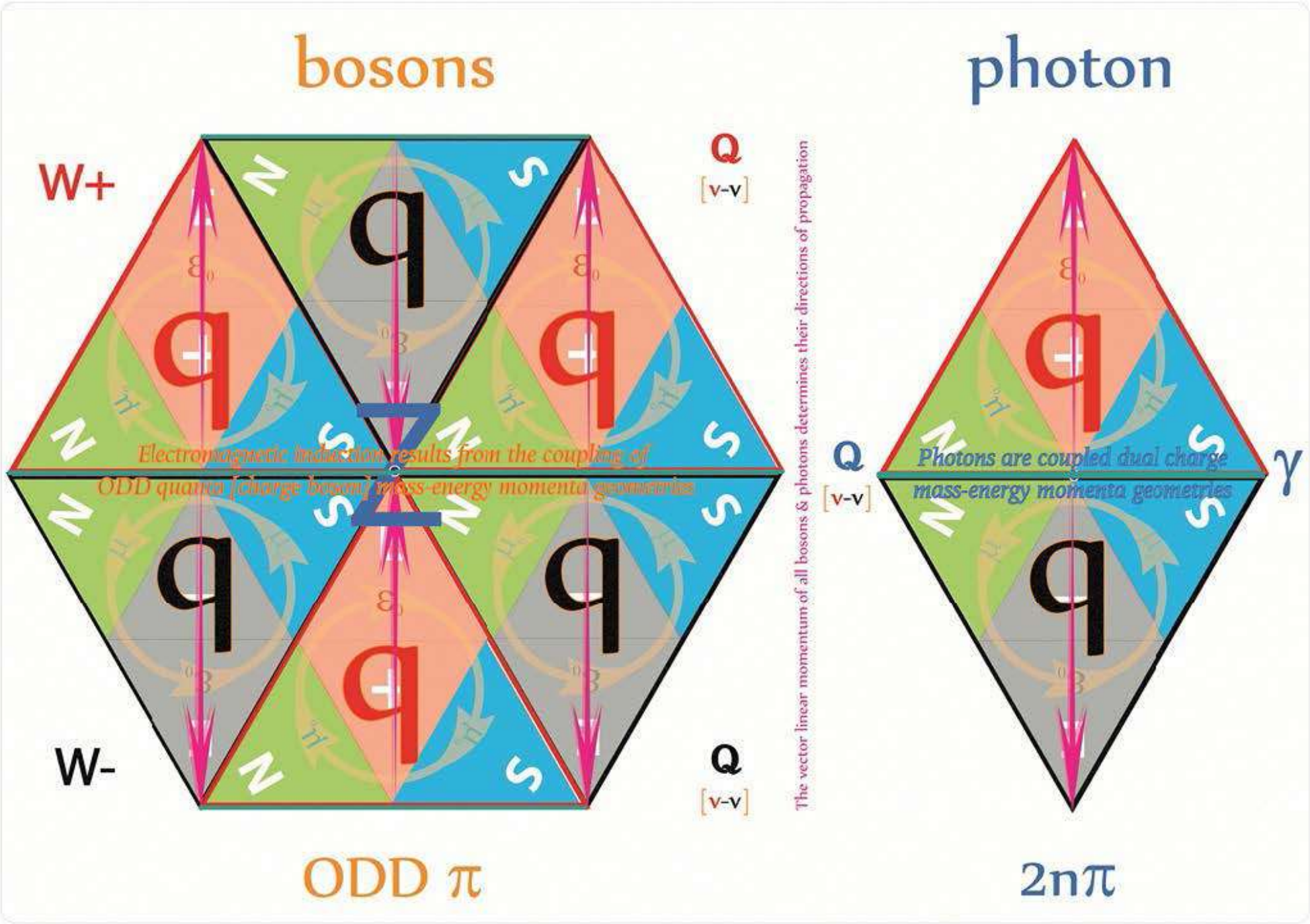

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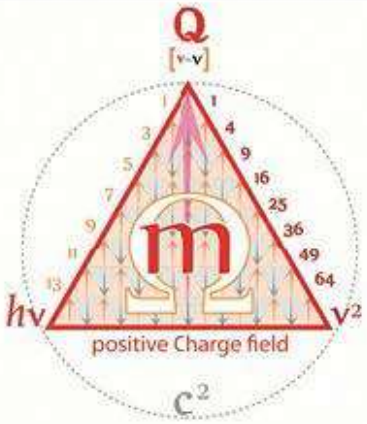
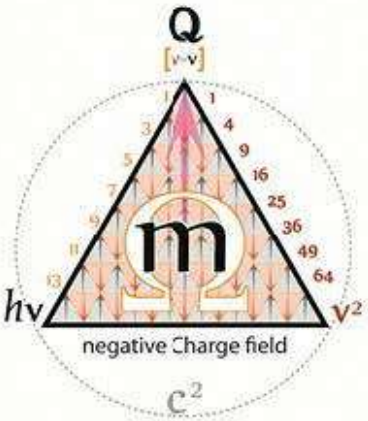


mass geometries

$$m \quad n\pi \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right] \quad \mathbb{E}$$

mass: $n\pi$ energy; spatial field: $\varepsilon_0\mu_0$ impedance; Planck quanta: $m\Omega v^2$ (mass, velocity)

mass-energy



the distribution of energy momenta in EM fields creates charged fascia

charged planar mass-energy momenta form

radiant 2D equilateral geometries

energy momenta per second

$$\rho \qquad \frac{E}{c^2} = \frac{m}{\text{mass}} \quad \mathbb{E}_{\text{ENERGY}} \quad \frac{M}{\text{Matter}} = \frac{E}{c^4} \qquad \rho$$

energy momenta per second squared

mass-energy geometries

m

kg/m^2

mass-Matter topologies

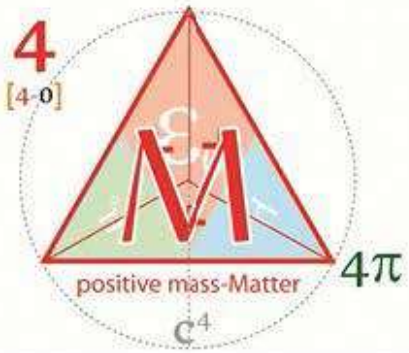
M

KG/m^3

charged mass-energy geometries form

standing-wave 3D tetrahedral topologies

Matter displacement topologies have internalised strong force fascia partitions

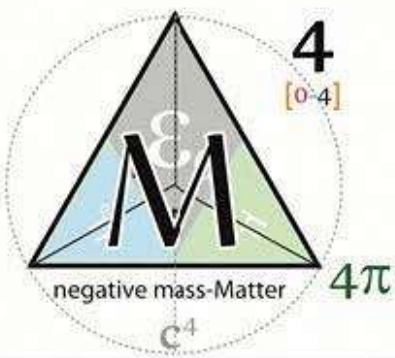


mass-Matter

$$m \quad 4n\pi \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right] \quad \mathbb{M}$$

spatial field: $\varepsilon_0\mu_0$ impedance; Planck quanta: $m\Omega v^2$ (mass, velocity); $4n\pi$ Matter

Matter topologies



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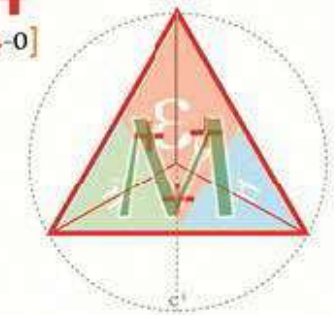
Matter

4
[4-0]



2D

ρ/sec

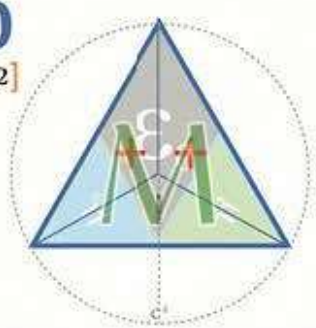
EM mass-energy per square metre

EM mass geometries

m

kg/m²

0
[2-2]



EM mass-energies have 2D planar geometries

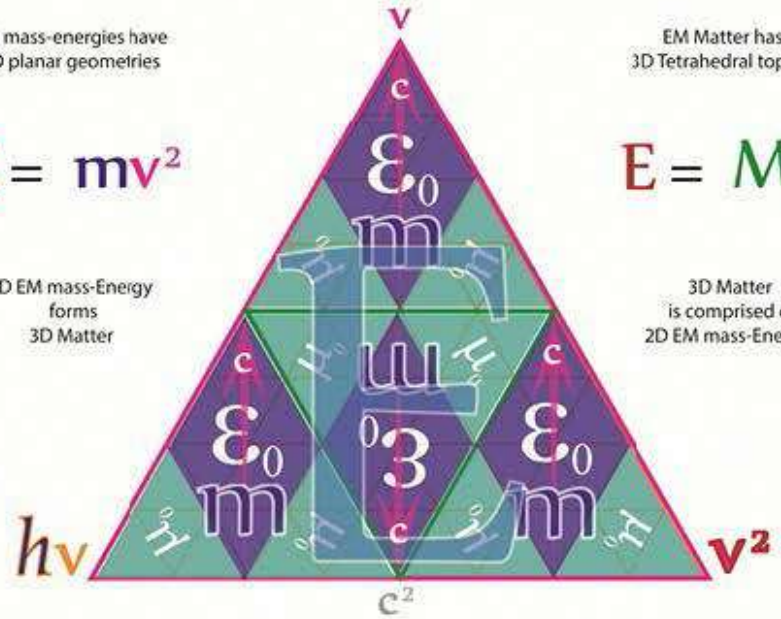
$E = mv^2$

2D EM mass-Energy forms 3D Matter

EM Matter has a 3D Tetrahedral topology

$E = Mc^4$

3D Matter is comprised of 2D EM mass-Energies



Matter is comprised of 4nπ mass-energy geometries forming a 3D standing wave topology

Tetryons: $4n\pi$ (Matter quanta) $[[\varepsilon_0\mu_0].[m\Omega v^2]]$ (EM Field: ElectroMagnetic; Planck quanta: mass, velocity)

Matter is anything that has a closed mass-energy topology and displaces a volume
(the 3D massive building blocks of quantum particles and atomic elements)

The EM mass-energy quanta of Matter can be measured transversely and longitudinally allowing them to exhibit a number of wave-like and particle-like properties
(de Broglie wavelength & Compton frequency)

0
[2-2]

3D

ρ/sec^2

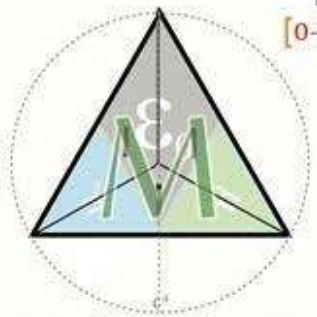
EM mass-energy per cubic metre

Matter topologies

M

kg/m³

4
[0-4]



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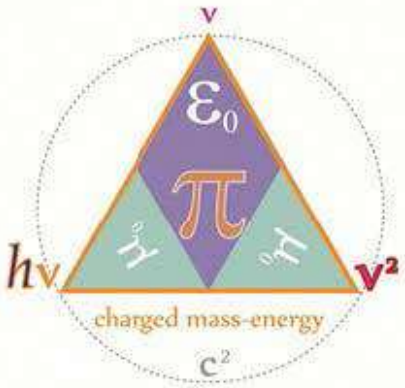
Tetryons - the quanta of Matter

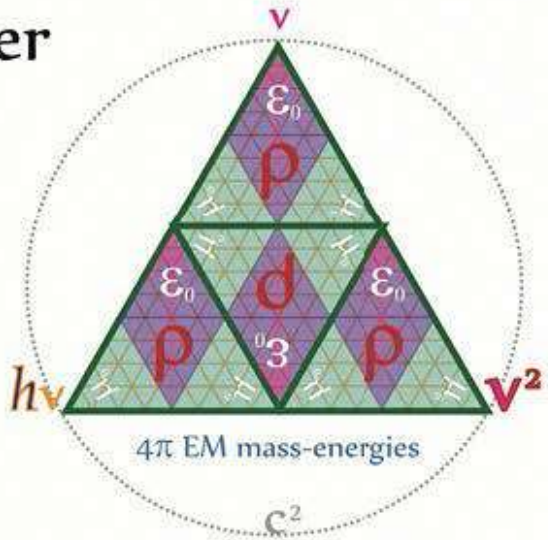


'massless' is a physics mis-nomer as
all energy exhibits mass equivalence

ZPF

mass-Energy quanta

m



$$m = n\pi\left[\left[\frac{1}{c^2}\right]_{\text{impedance}}^{\text{spatial}}.\left[m\Omega v^2\right]_{\text{mass velocity}}^{\text{Planck quanta}}\right]_{\text{momenta}}^{\text{Energy}}$$

TETRYONS

Platonic tetrahedrons are the foundational topologies of all 3D Matter

$$T\pi\left[\left[\frac{1}{c^4}\right]_{\text{impedance}}^{\text{spatial}}.\left[m\Omega v^2\right]_{\text{mass velocity}}^{\text{Planck quanta}}\right]_{\text{momenta}}^{\text{Energy}} = M_{\text{Matter}}$$

Tetryon

Matter Quantum

M

2D mass-energy geometries
can be combined to form
3D mass-ENERGY-Matter particles

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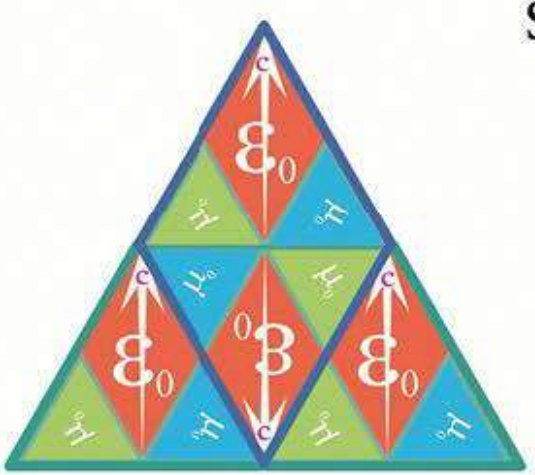
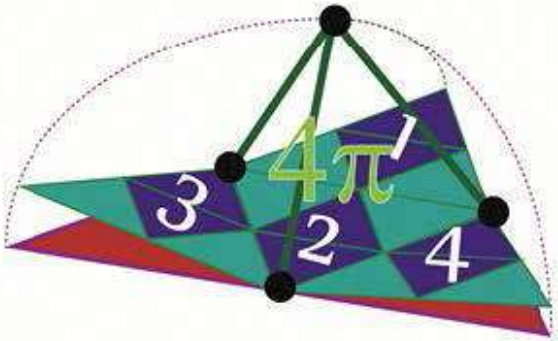
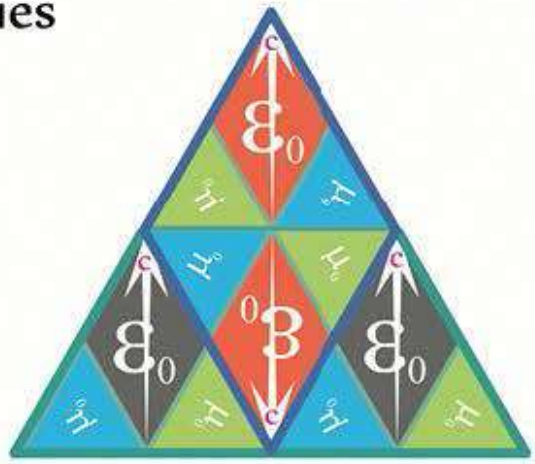
Standing wave mass-energy geometries and Matter topologies



As each charged fascia's E field tries to propagate outwards it interacts with a M field dipole at each apex

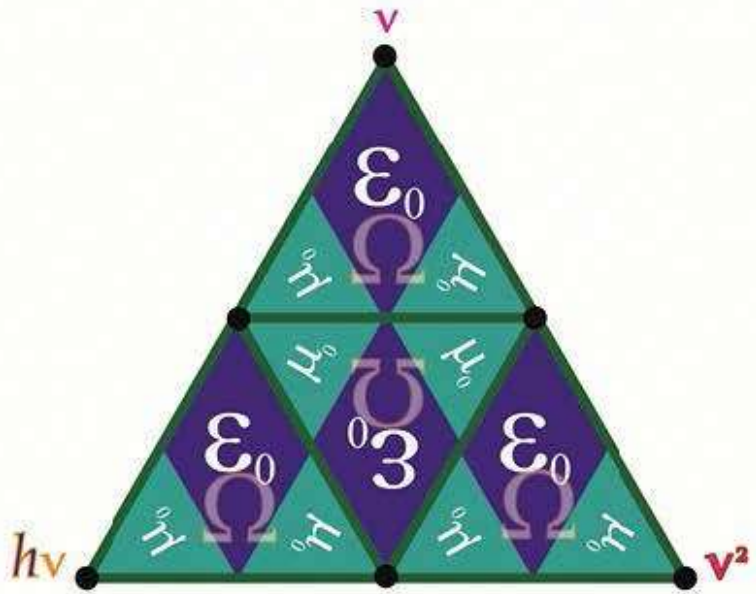


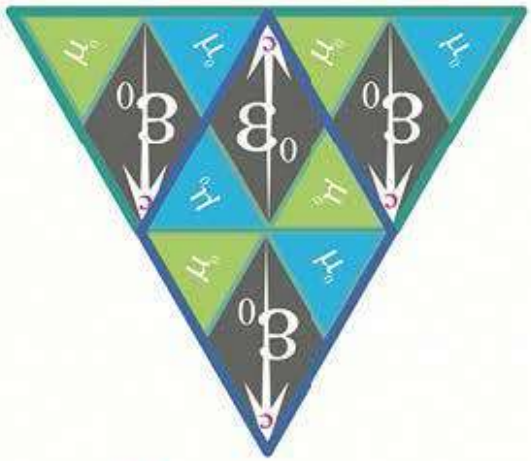
$$M_{Matter} = T\pi\left[\left[\frac{1}{c^4}\right]_{impedance}^{spatial}.\left[m\Omega v^2\right]_{mass\ \ velocity}^{Planck\ \ quanta}\right]_{momenta}^{Energy}$$



In turn energised M fields supply energy to the E Fields creating a EM standing wave [the EM topology of Matter]

Matter stores EM mass-energies geometries in its 3D Tetrahedral topology





All mass-energy propagate at the speed of light creating linear energy momentum

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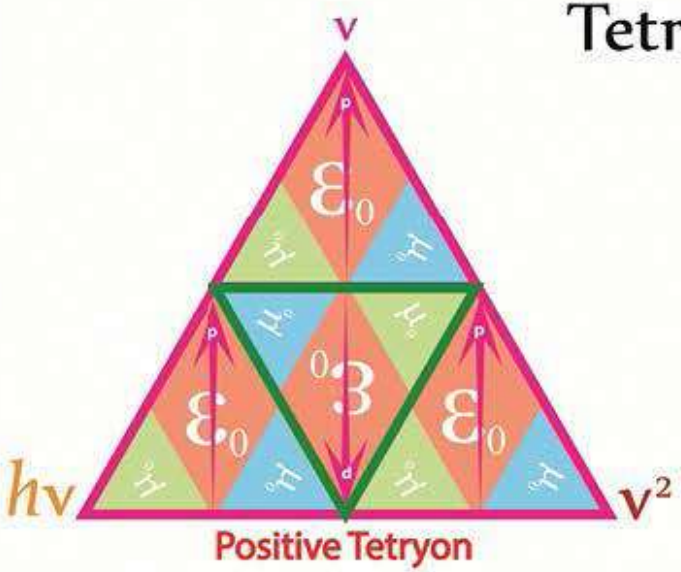
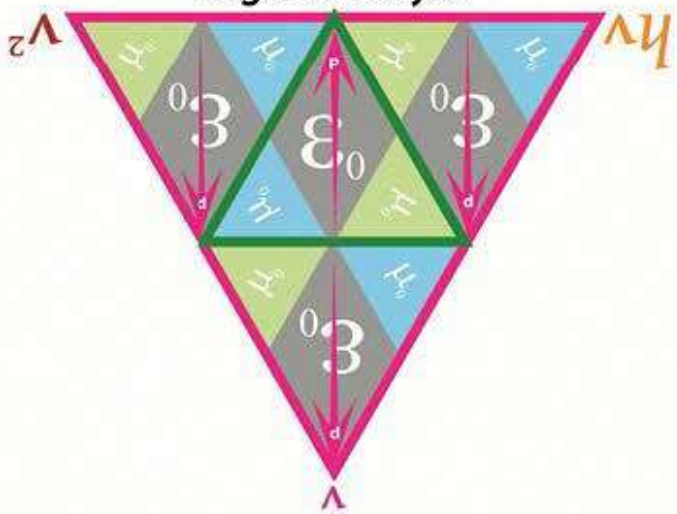
Tetryonic charge topologies



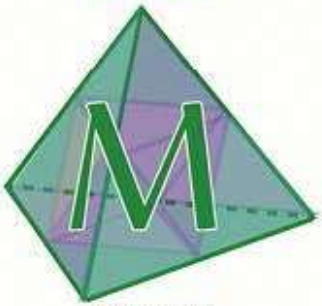
Positive Tetryon

The 3D Tetryonic volume of Matter is what distingushes it from 2D EM mass-energies

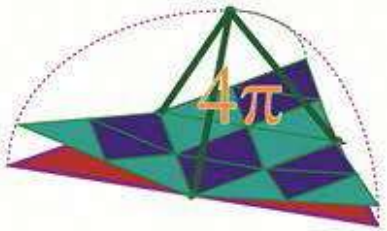
Negative Tetryon



TETRYONS



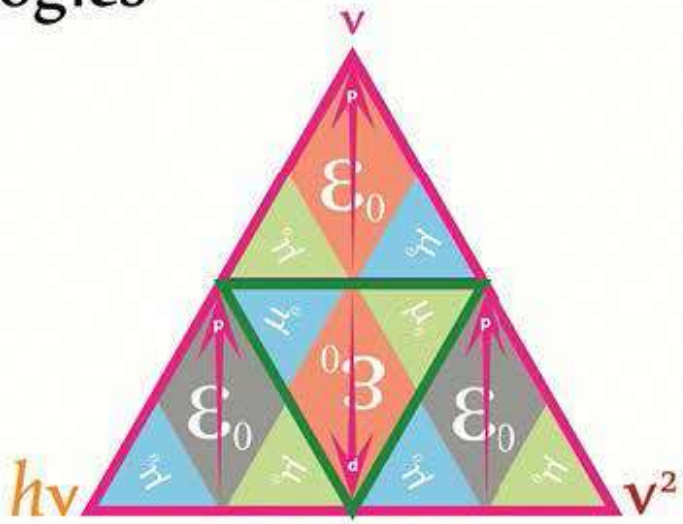
[MATTER]



The four EM mass-energy momenta produced by Tetryonic collapse must not be confused with the classical 4 Energy-momenta (which refers to x,y,z co-ordinates & v)

4pi radiant mass-energies

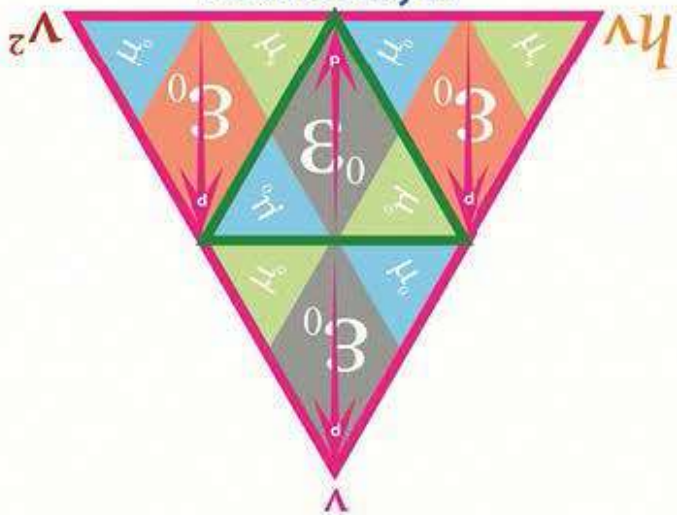
Four 2D mass-energy geometries can combine to form via charge interactions 3D tetrahedral Matter topologies



Neutral Tetryon

A 3D Tetryon can be 'collapsed' into a 2D waveform radiant four energy momenta EM waveform that conserves all of its 2D mass-energy-momenta

Neutral Tetryon



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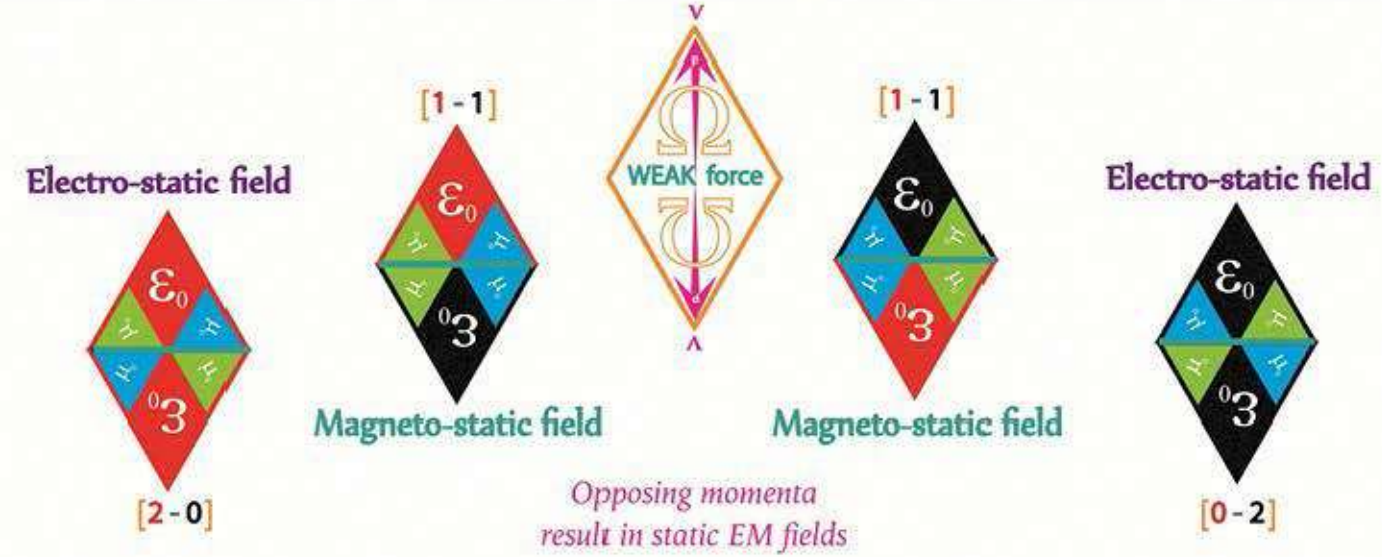
Tetryon Genesis

1. WEAK interaction
Mutual Inductive Coupling
[Magnetic dipoles interact]

ODDπ
charged mass-energies

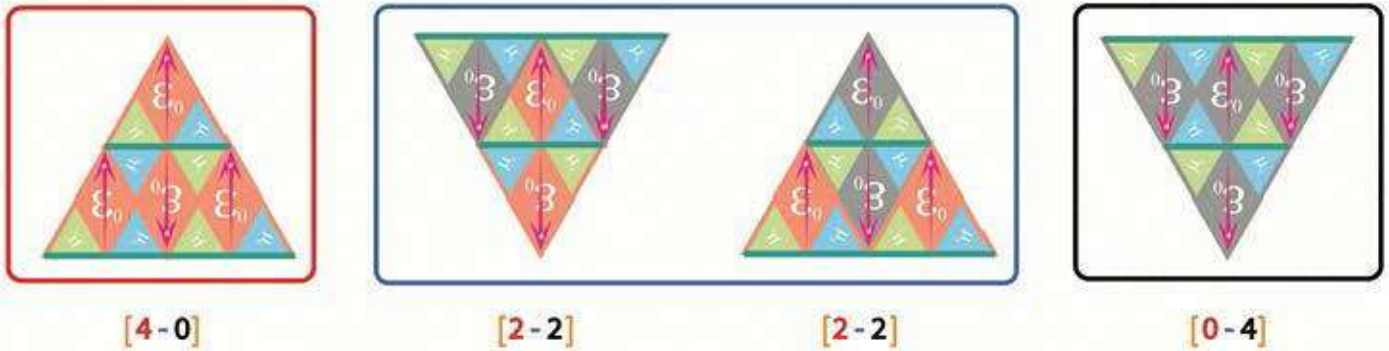
Non-Zero
nett mass-Energy-momenta
result in Linear momentum



EVENπ
radiant mass-energies

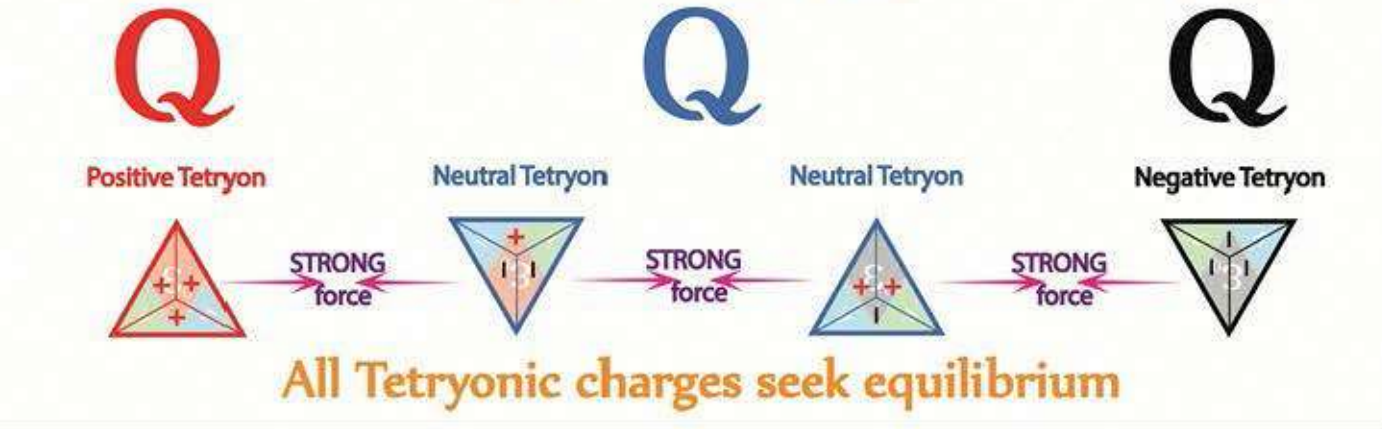
2. *2D EM mass-energies*
interact to form
3D Matter topologies

EM wave momenta
can form standing waves
[Matter geometries]



3. STRONG interaction
Electrostatic Matter attract
via Electric charges and
Magnetic dipoles

4nπ
mass-Matter geometries



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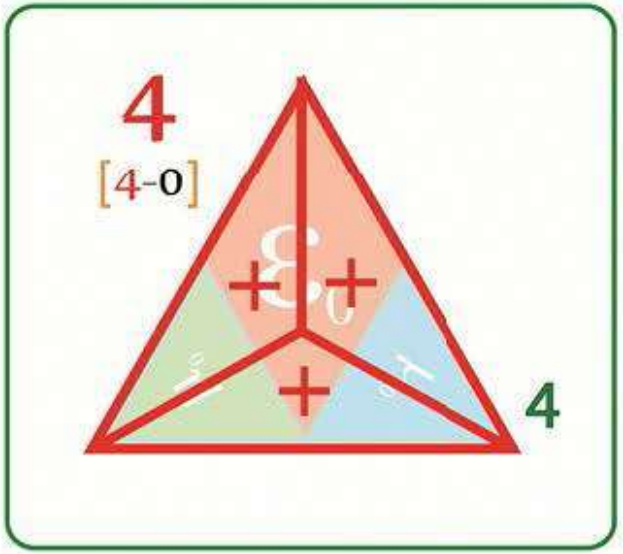
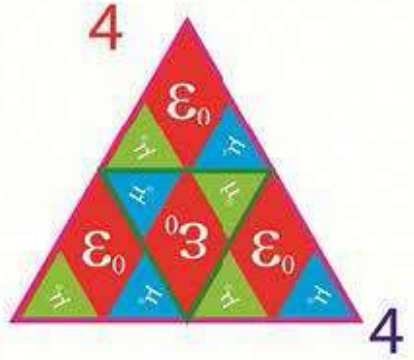
Positive Tetryon

[4-0]

charged boson geometry

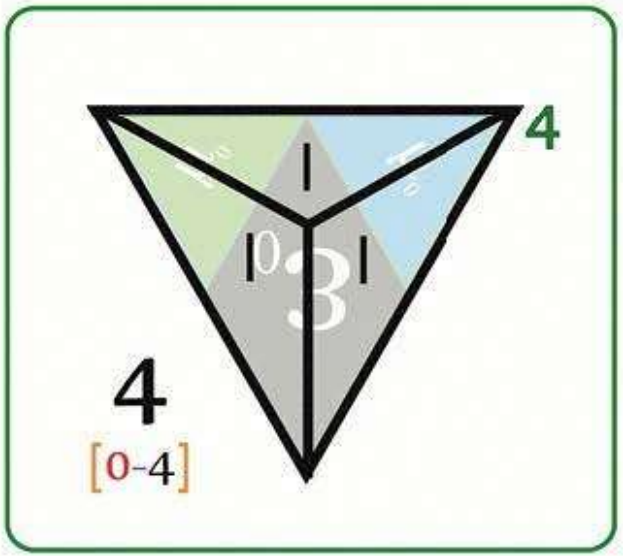


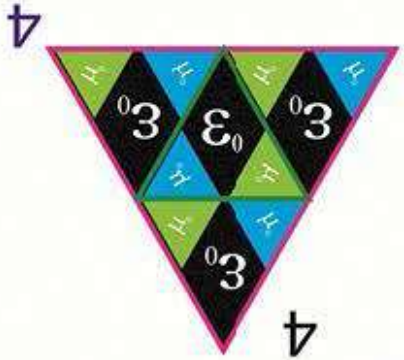
standing-wave Matter topology



radiant mass-energy geometries

[0-4]





Negative Tetryon

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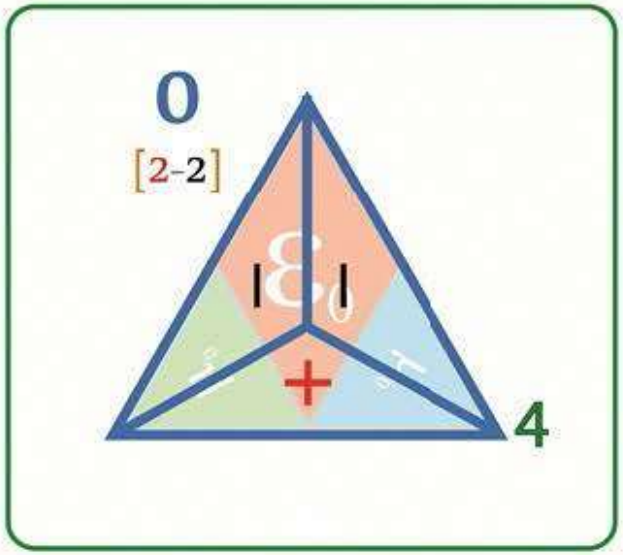
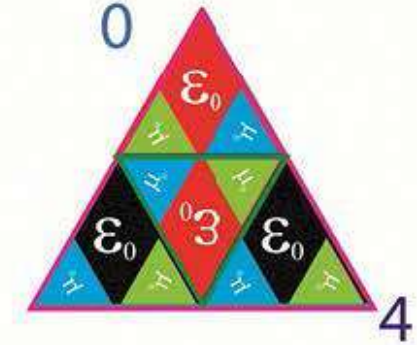
Neutral Tetryons

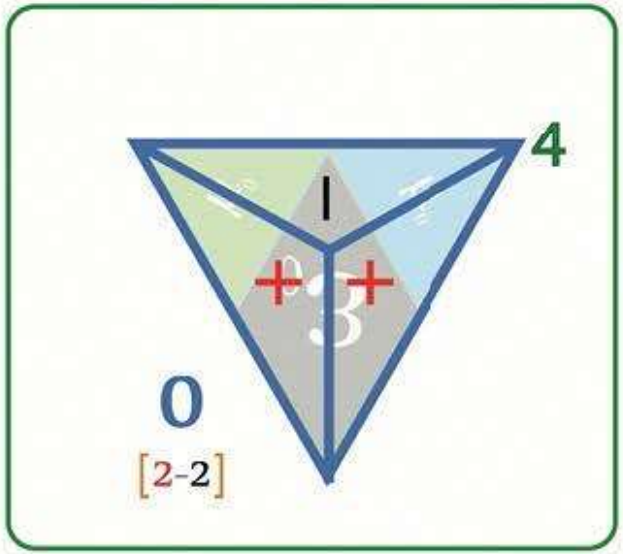
charged boson geometry



standing-wave Matter topology



radiant mass-energy geometries



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mass

$$m_{mass} = n\pi\left[\left[1/c^2\right]_{impedance}.\left[m\Omega v^2\right]_{mass\ velocity}^{Planck\ quanta}\right]^{Energy}_{momenta}$$

radiant mass-energy geometries

$$E = mc^2$$

Energy per second

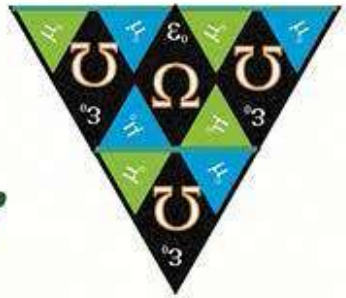
energy

$$n\pi\left[m\Omega v^2\right]_{mass\ velocity}^{Planck\ quanta}$$

Energy per second ^{2}

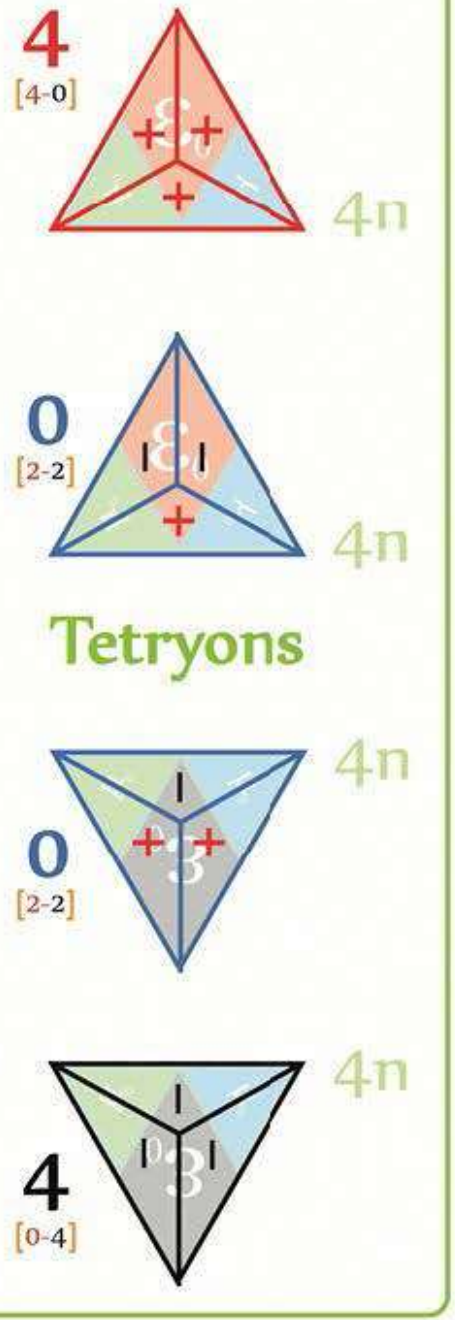
$$E = Mc^4$$

Matter



$$M_{Matter} = T\pi\left[\left[1/c^4\right]_{impedance}.\left[m\Omega v^2\right]_{mass\ velocity}^{Planck\ quanta}\right]^{Energy}_{momenta}$$

standing wave Matter topologies



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$$\text{mass}\ n\pi\ \text{geometry}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$
EM Field · Planck quanta
ElectroMagnetic · mass · velocity

mass-ENERGY-Matter

geometries topologies

ALL EM masss-energies have equilateral geometry

Transverse EM mass-energies form bosons [Quantum levels]

Longitudinal EM mass-Energies form Photons

Bosons combine to form SQUARED scalar EM energies

massless is a scientific misnomer

2D [non-Topolgical] EM mass-ENERGY is 'Matterless'

ALL Matter has a 3D topology

q [v-v] c^2

2D mass-energy geometries are a property of 3D Matter topologies

Q [v-v] c^4

Tetryonic Matter is the building block of all Fermions, elements and compounds

$$\text{Matter}\ T\pi\ \text{topology}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$
EM Field · Planck quanta
ElectroMagnetic · mass · velocity

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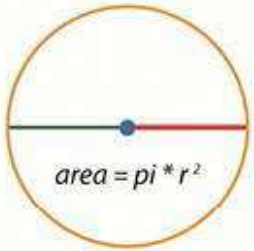
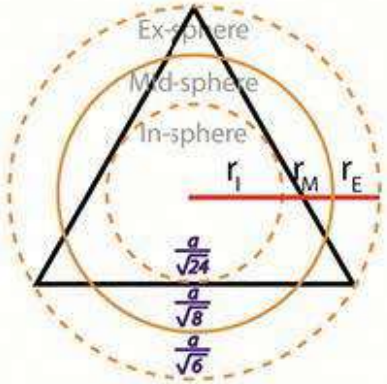
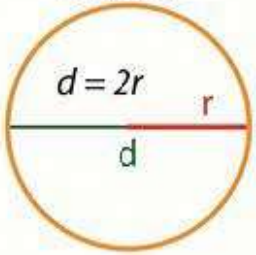
Tetryonic Matter

All quantum Matter has a foundational tetrahedral topology as a result of their equilateral mass-energy geometries
[not spherical as has been assumed from the math]

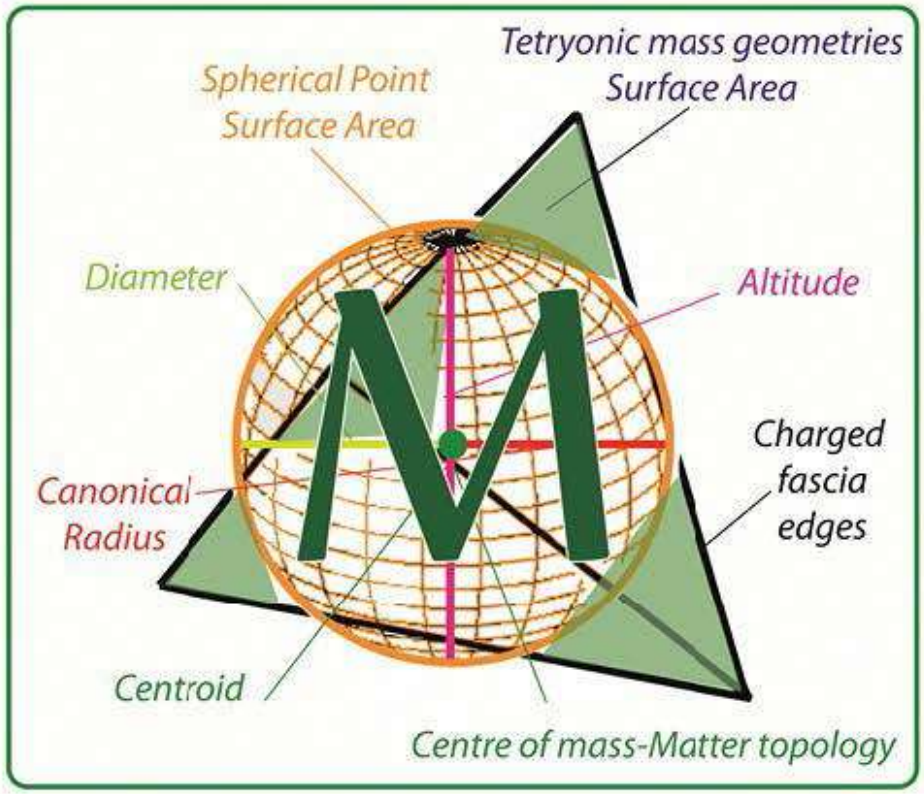




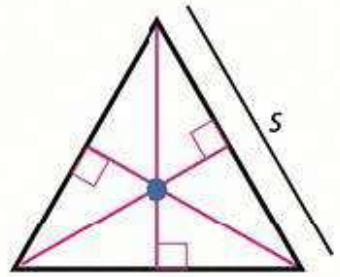
Sphere



Area sphere= 4π r²
Surface curvature = 1/r²
Total curvature = 4π

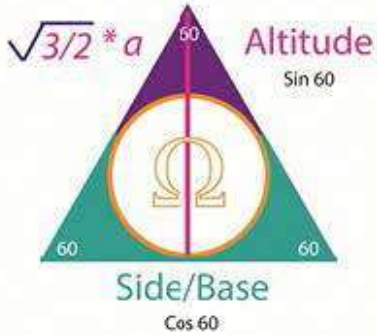


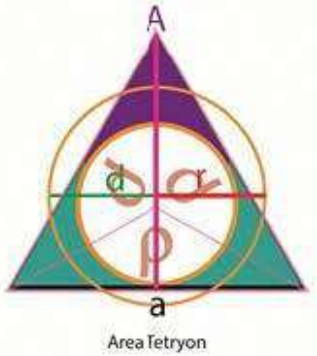
Spheres & Tetrahedra are both 3D Platonic solids with 4π scalar integral Gaussian topologies and physical displacement volumes [Gauss-Bonnet theorem]



area = $\sqrt{3/4} * a^2$

ZPF fascia





$A = 4\,A_0 = \sqrt{3}a^2$

Vertex curvature = π
Total curvature = 4π

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Dodecyons

while quarks & leptons are comprised of
12π mass-energy geometries
they have differing final Matter topologies

up quark — 8 [10-2] — +1/3

anti-strange quark

top quark

charmed quark — +2/3

8π

strange quark

bottom quark — -1/3

anti-bottom quark

8 [2-10]

anti-up quark — -2/3

anti-down quark — 4 [8-4]

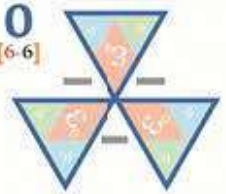
anti-charmed quark

quarks

anti-top quark — 4 [4-8]

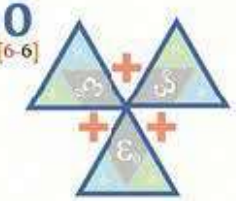
down quark

electron neutrino — 0 [6-6]



neutrinos

0 [6-6]



positron neutrino

positron — 12 [12-0] — e — +1

anti-τ neutrino

anti-μ neutrino

tau

12π — 0

muon

muon neutrino

tau neutrino

12 [0-12]

electron — e — -1

$$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) — Planck quanta (mass, velocity)

Quarks have octahedral topologies

Leptons have dodecahedral topologies

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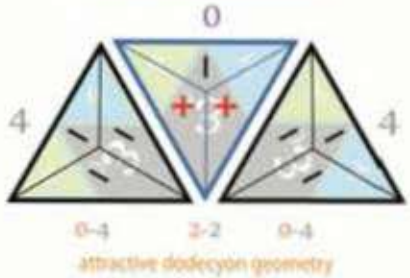
-2/3

quark octahedral topology



attractive dodecyon geometry

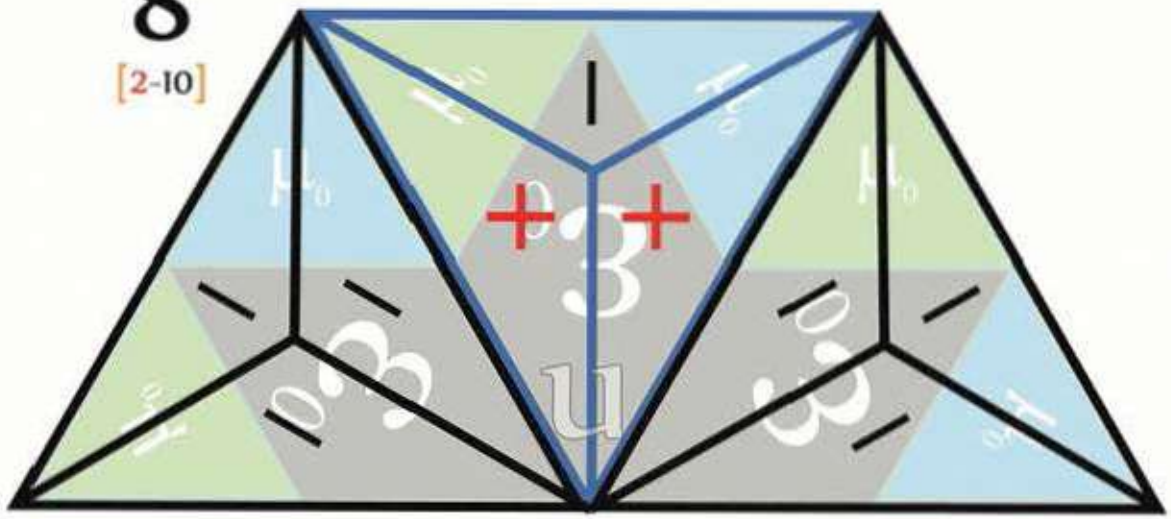
anti-up quark

as mass-energy momenta is added to
Matter topologies & KEM fields of motion
different generations of particles are created

$$12\pi \text{ dodecyon } \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field — Planck quanta — ElectroMagnetic — mass — velocity

1. **anti-up** quark
2. **anti-charmed** quark
3. **anti-top** quark



charged mass-Matter topology

8π

Quarks have 12 charged fascia - mass-energy geometries

2 Positive 10 Negative

Quarks have octahedral mass-Matter topologies

[-2/3 elementary charge]

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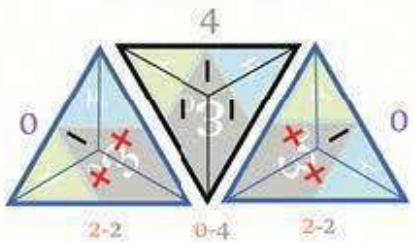
-1/3

quark octahedral topology



attractive dedecyon geometry

down quark

EM Field Planck quanta

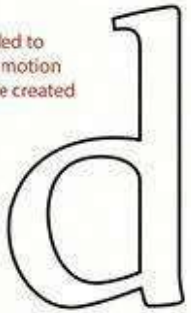
$12\pi \left[\left[\varepsilon_0 \mu_0 \right] . \left[m \Omega v^2 \right] \right]$

dodécyon

ElectroMagnetic mass velocity

as mass-energy momenta is added to Matter topologies & KEM fields of motion different generations of particles are created

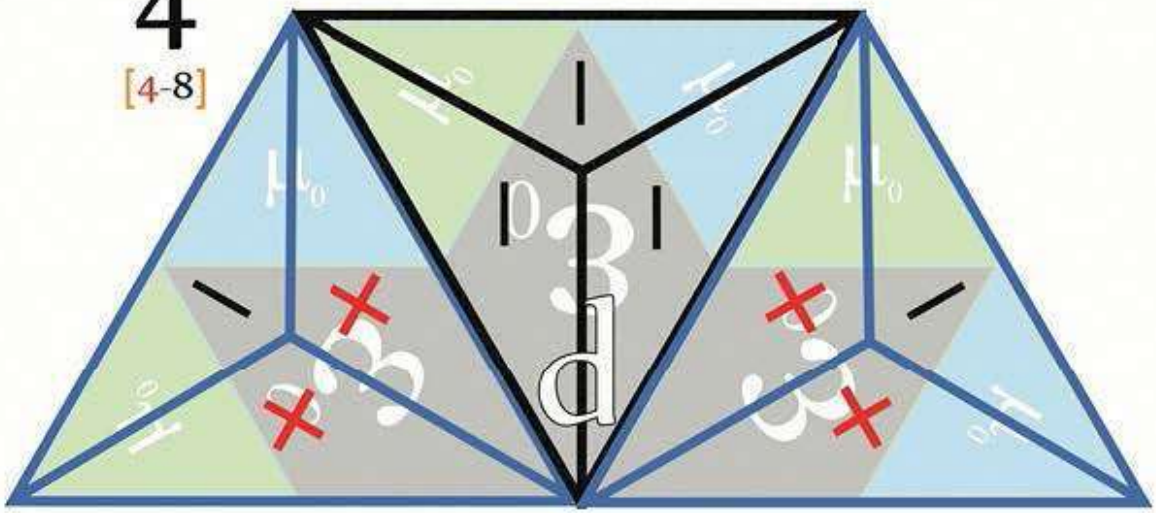
1. **down** quark
2. **strange** quark
3. **bottom** quark



nett charge

4

[4-8]



charged mass-Matter topology

8π

Quarks have 12 charged fascia - mass-energy geometries

4 Positive 8 Negative

Quarks have octahedral mass-Matter topologies

[-1/3 elementary charge]

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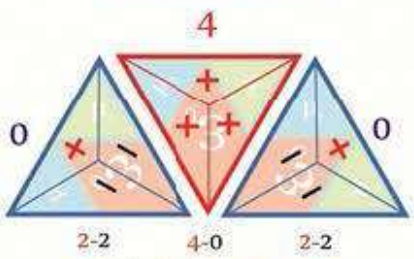
anti-down quark

+1/3

quark octahedral topology



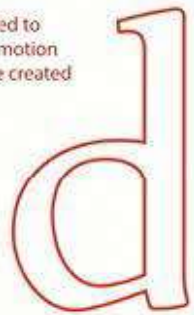
attractive dodecyon geometry

$$12\pi \text{ dodecyon } \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta · mass · velocity

as mass-energy momenta is added to Matter topologies & KEM fields of motion different generations of particles are created

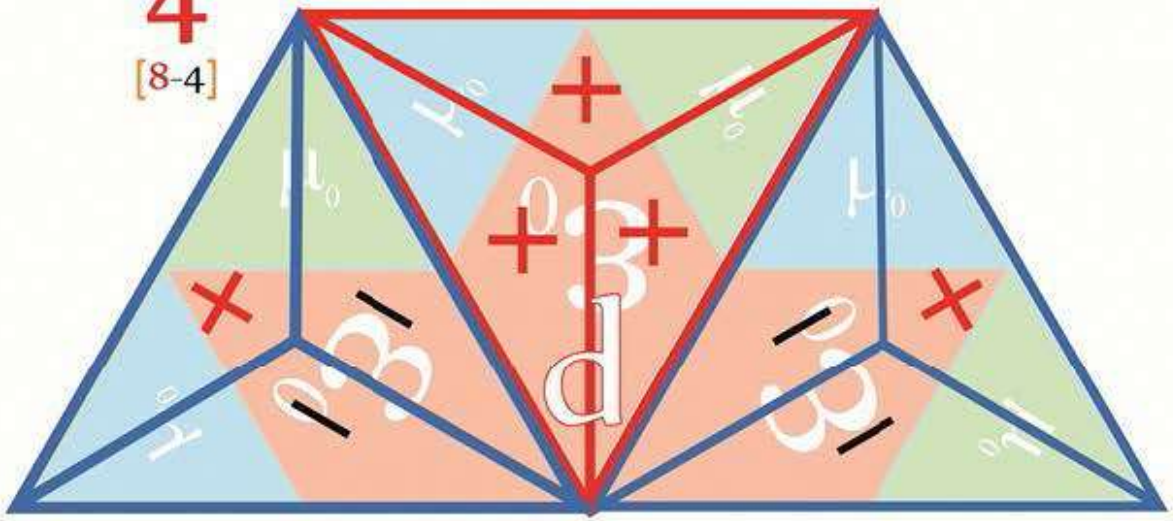
1. **anti-down** quark
2. **anti-strange** quark
3. **anti-bottom** quark



nett charge

4

[8-4]



charged mass-Matter topology

8π

Quarks have 12 charged fascia - mass-energy geometries

8 Positive 4 Negative

Quarks have octahedral mass-Matter topologies

[+1/3 elementary charge]

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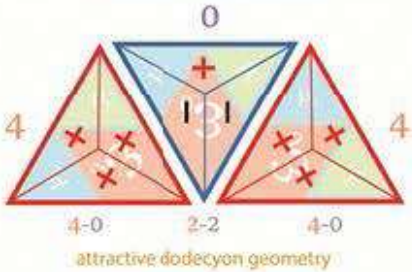
up quark

+2/3

quark octahedral topology



attractive dodecyon geometry

$$12\pi \text{ dodecyon } \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta · mass · velocity

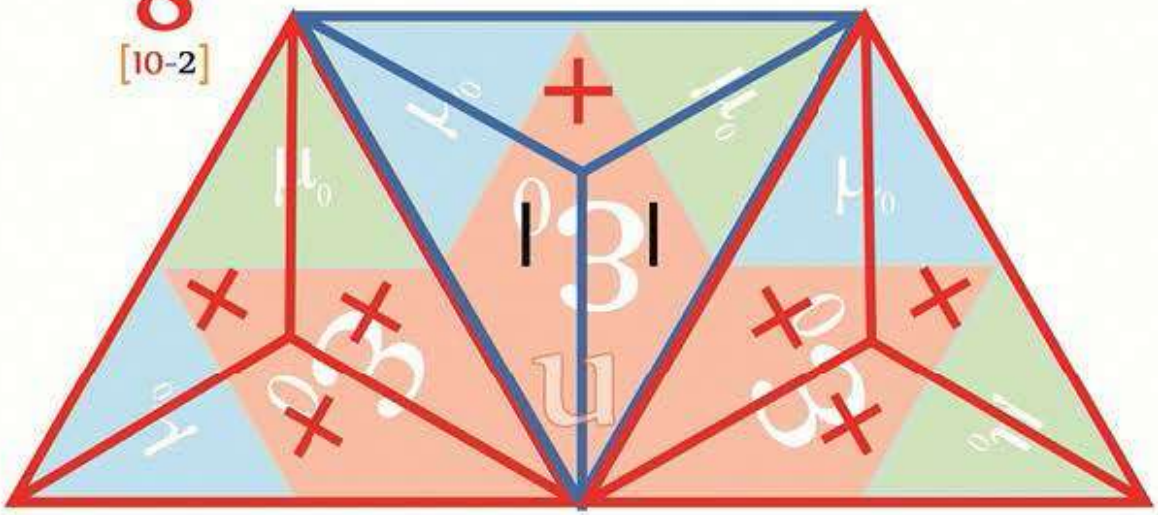
as mass-energy momenta is added to Matter topologies & KEM fields of motion different generations of particles are created

1. **up** quark
2. **charmed** quark
3. **top** quark

nett charge

8

[10-2]



charged mass-Matter topology

8π

Quarks have 12 charged fascia - mass-energy geometries

10 Positive 2 Negative

Quarks have octahedral mass-Matter topologies

[+2/3 elementary charge]

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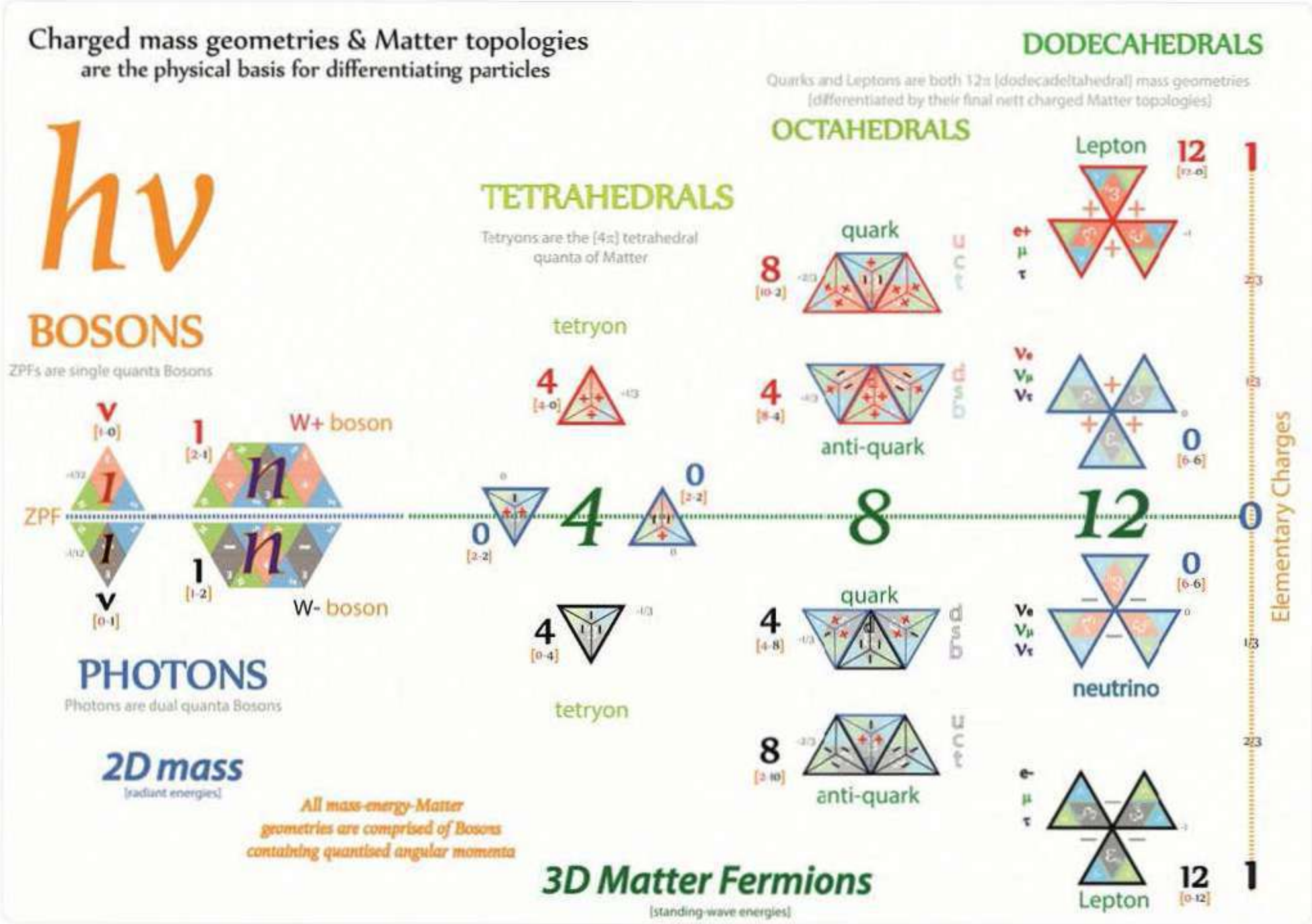

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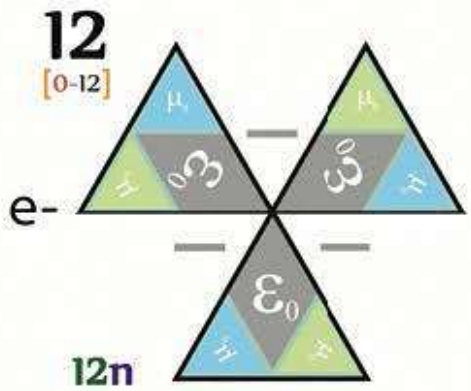
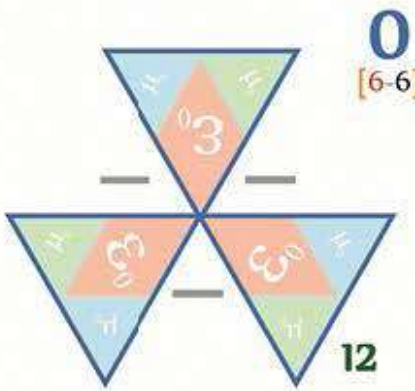
divergent negative E-fields

electron

convergent negative E-fields





ν−

divergent negative E-fields

electron neutrino

convergent positive E-fields

Leptons have 12 charged mass-energy fascia geometries

Repulsive STRONG force creates Lepton topologies

12π

Tetryonic charged fascias creates the Matter topologies of all Leptons

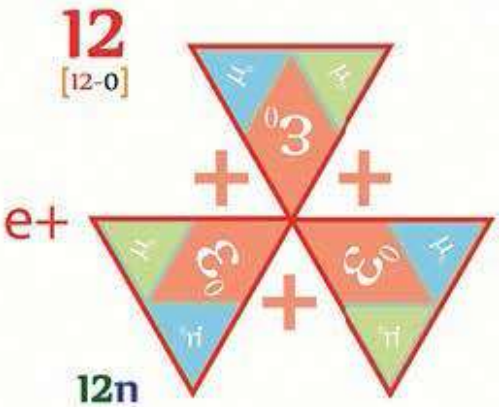
Repulsive STRONG force creates Neutrino topologies

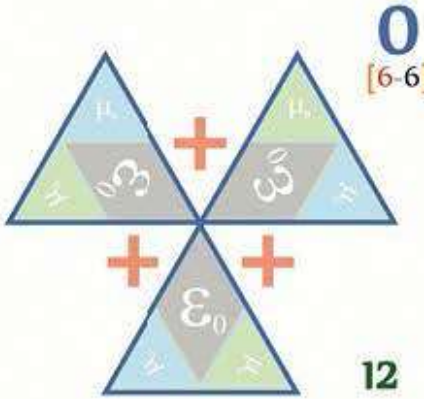
Leptons have dodecadeltahedral mass-Matter topologies

divergent positive E-fields

positron

convergent positive E-fields





ν+

divergent positive E-fields

positron neutrino

convergent negative E-fields

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Charged Leptons

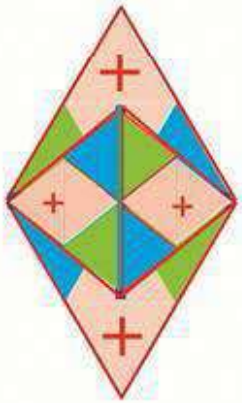
$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

Dodecyon · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

positron

e+

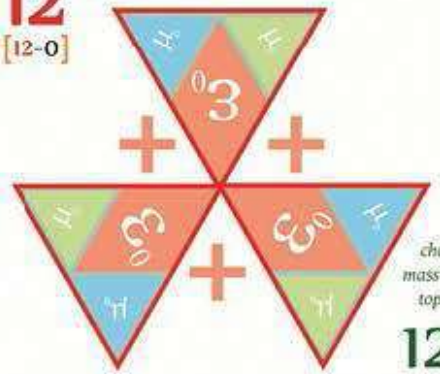
12



net charge

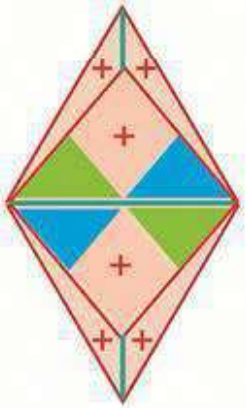
12

[12-0]



charged mass-Matter topology

12π



1. positron
2. anti-muon
3. anti-tau

Leptons have 12 charged mass-energy fascia geometries

12 positive charge fascia or 12 Negative charge fascia

repulsive dodecyon geometries

lepton topologies

Charged Leptons have dodecadeltahedral mass-Matter topologies

[1 elementary charge]

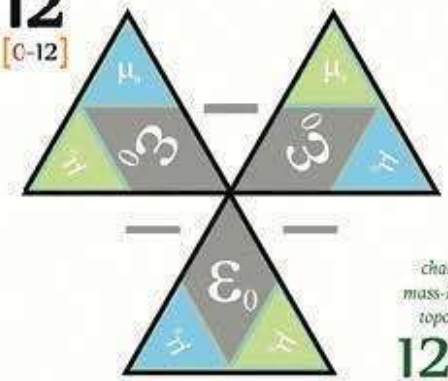
e-

12

net charge

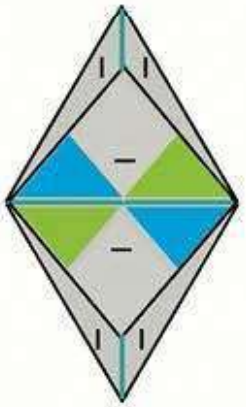
12

[0-12]



charged mass-Matter topology

12π



1. electron
2. muon
3. tau

electron

as mass-energy momenta is added to Matter topologies & KEM fields of motion different generations of particles are created

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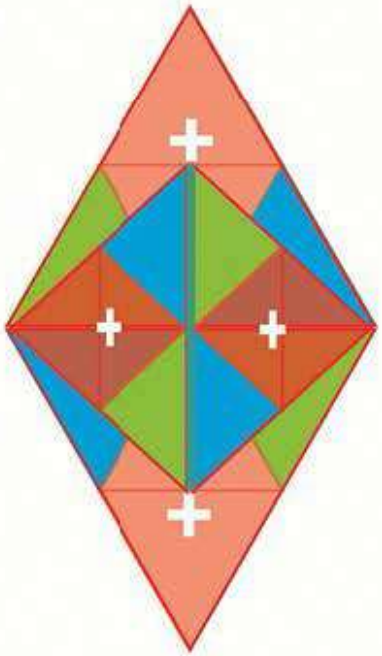
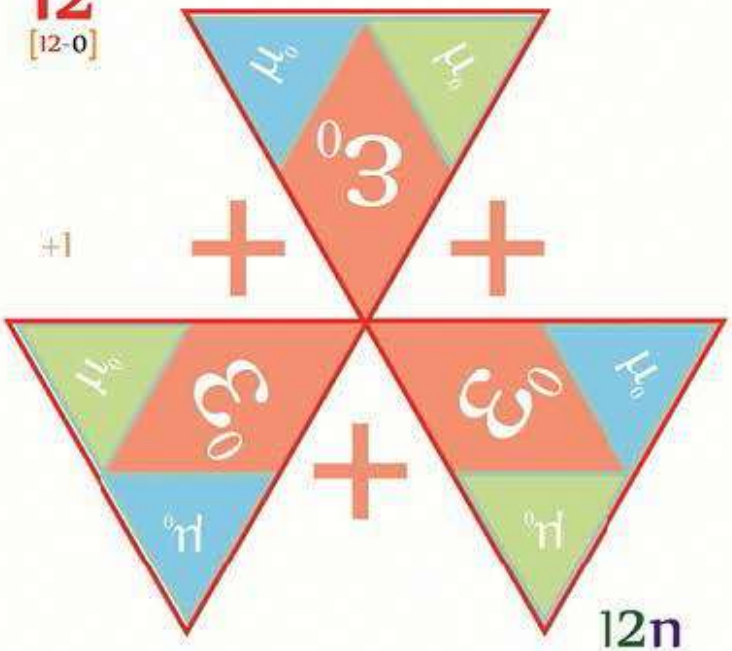
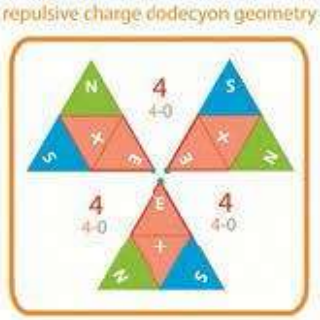
positron







$$12\pi \text{ Dodecyon } \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

1. positron
2. anti-muon
3. anti-tau

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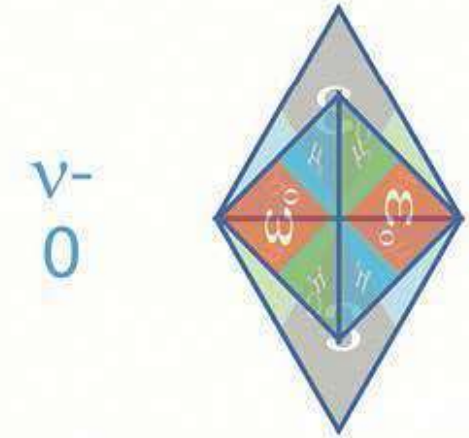
Neutral Leptons

$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

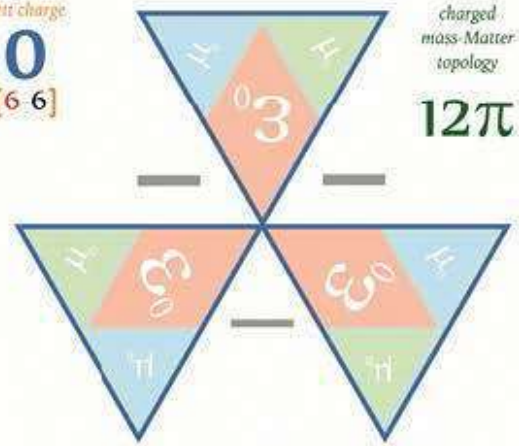
Dodecyon — EM Field (ElectroMagnetic) — Planck quanta (mass, velocity)



$\nu-$
0

net charge
0
[6-6]

charged mass-Matter topology
12π



1. electron neutrino
2. muon neutrino
3. tau neutrino

Neutrinos have 12 charged mass-energy fascia geometries

6 Positive & 6 Negative

repulsive dodecyon geometries

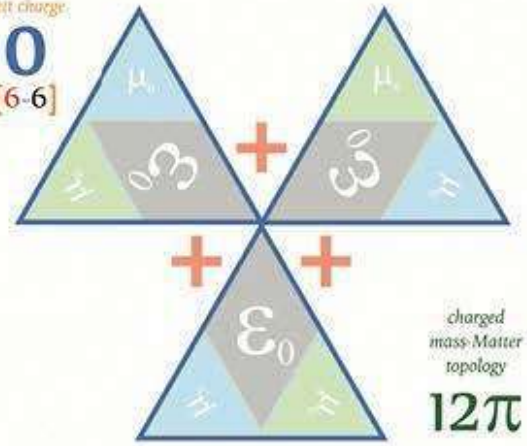
lepton topologies

Neutrinos have neutral dodecadeltahedral mass-Matter topologies

[0 elementary charge]

$\nu+$
0

net charge
0
[6-6]



charged mass-Matter topology
12π

1. positron neutrino
2. anti- muon neutrino
3. anti-tau neutrino

as mass-energy momenta is added to Matter topologies & KEM fields of motion different generations of particles are created

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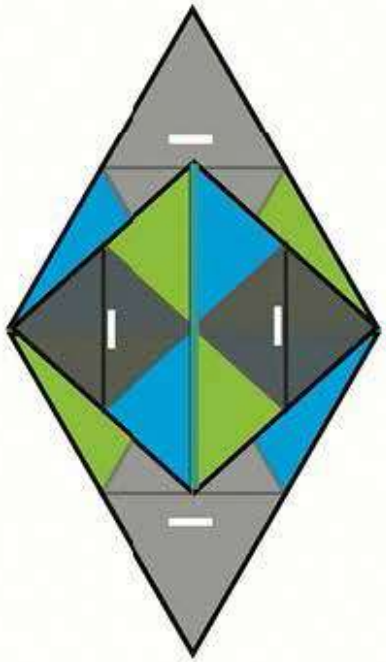
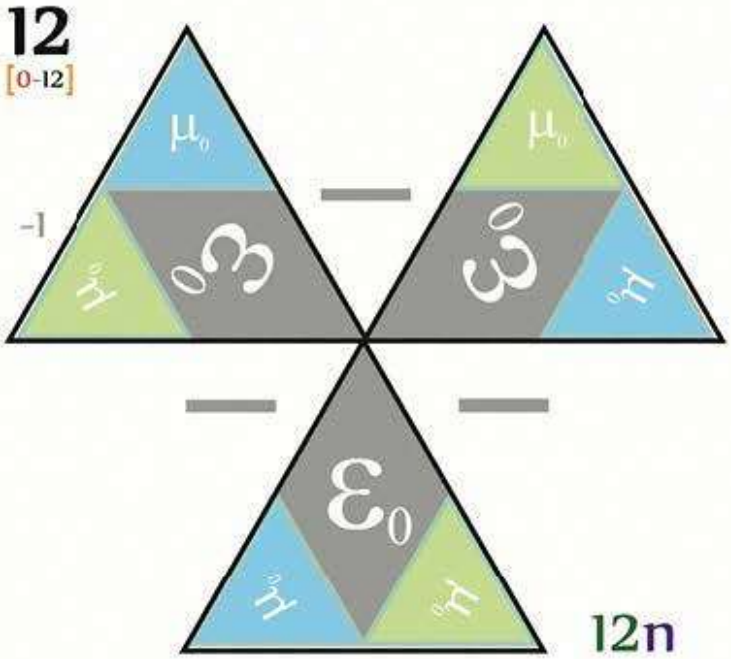
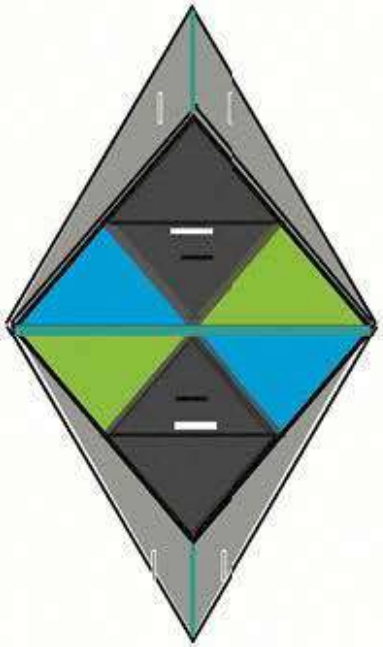
electron







$$12\pi\,\text{Dodecyon}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

1. electron
2. muon
3. tau

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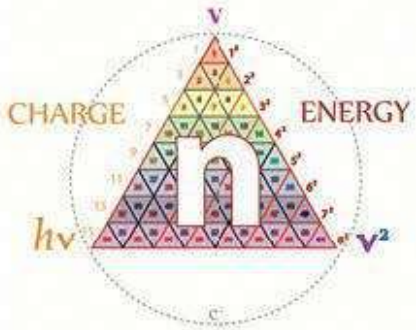
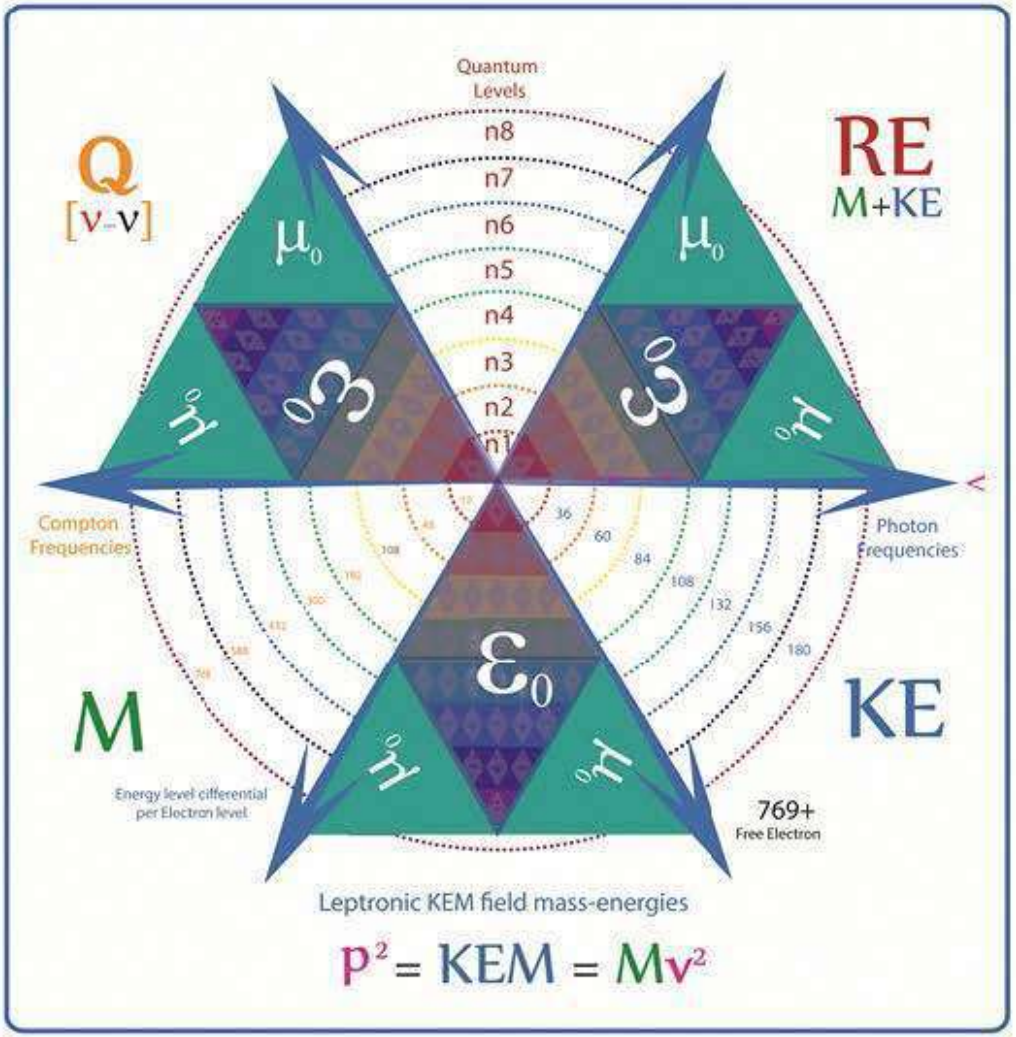
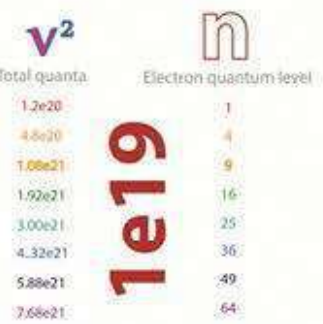
Leptronic Quantum levels

[KEM field mass-energy geometry]





Illustrative schema only: All Leptonic quantum levels have the same equilateral KEM geometry as the compton frequency of the KEM field increases the wavelengths of the quanta decrease



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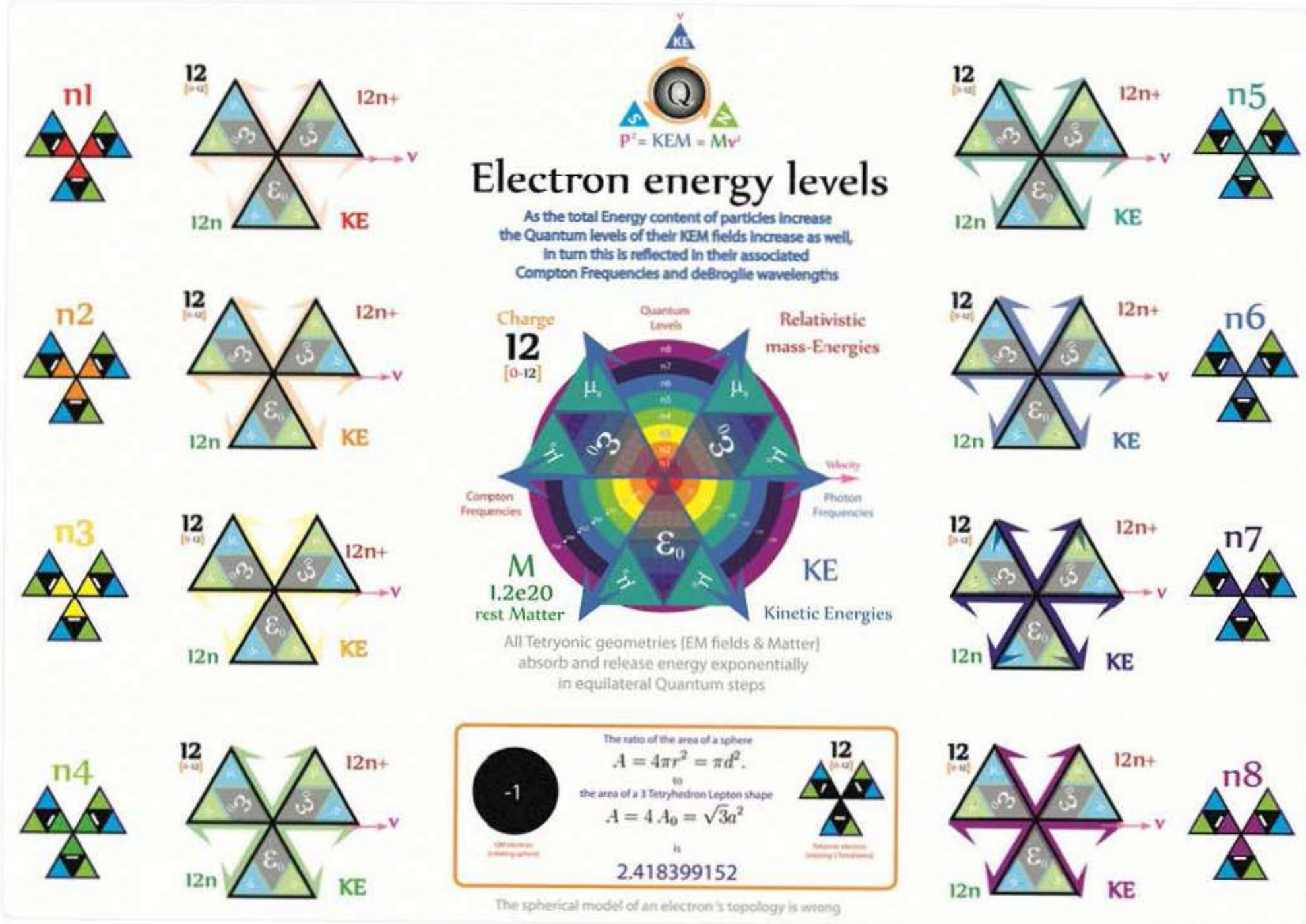

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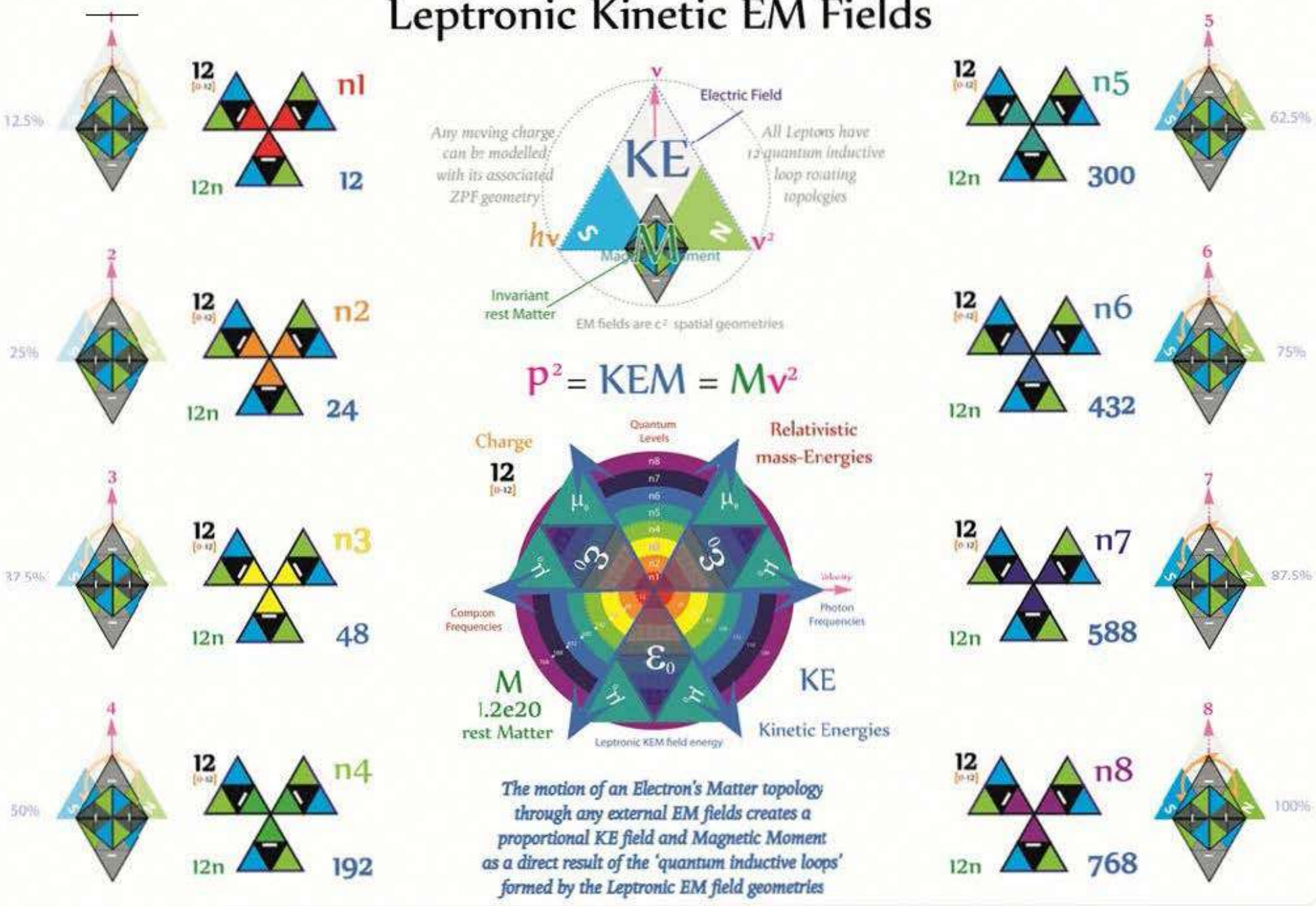
Leptronic Kinetic EM Fields



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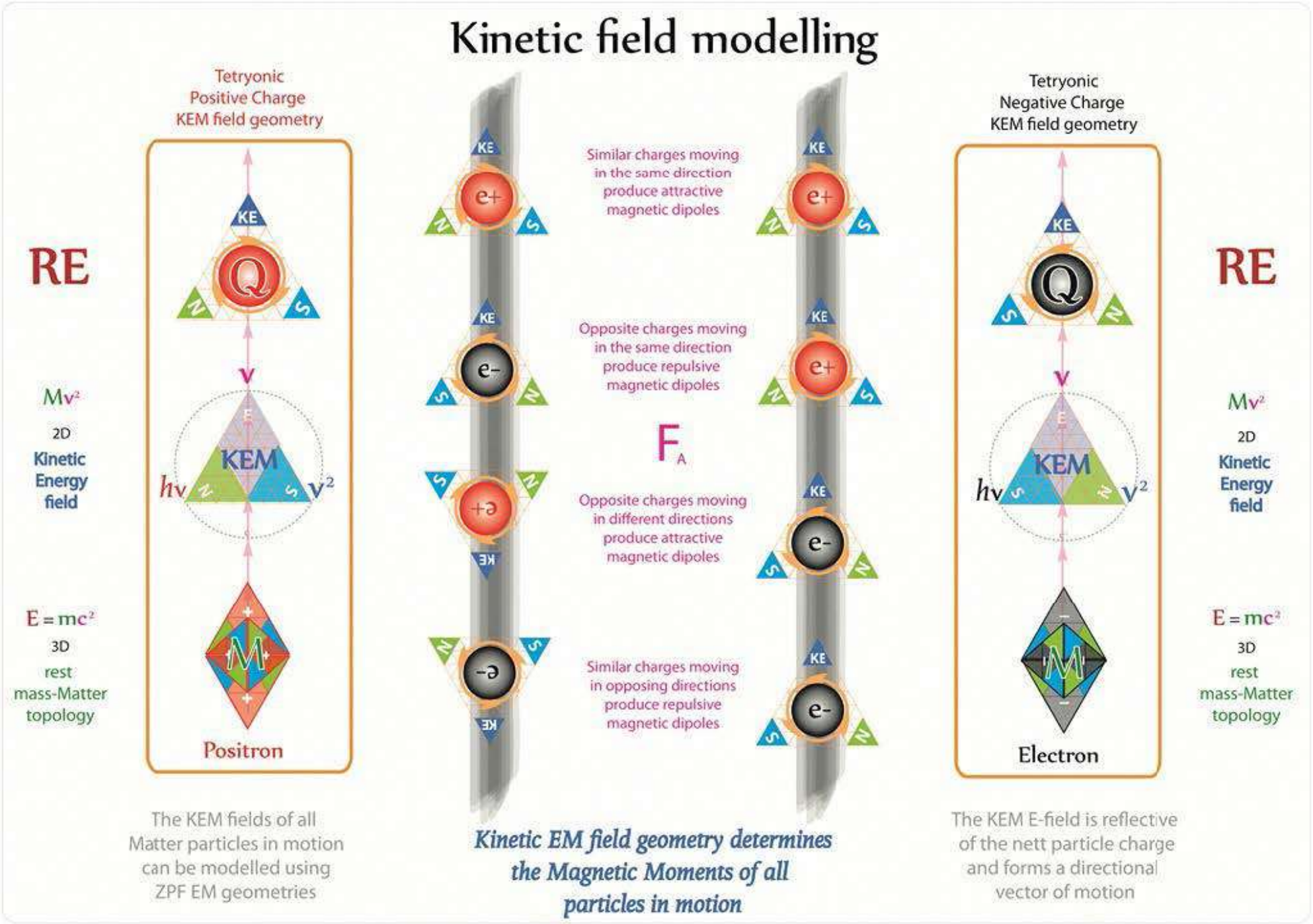
Kinetic field modelling



The KEM fields of all Matter particles in motion can be modelled using ZPF EM geometries

Kinetic EM field geometry determines the Magnetic Moments of all particles in motion

The KEM E-field is reflective of the nett particle charge and forms a directional vector of motion

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Lepton Families & Generations

Charged Matter topologies in motion creates Kinetic EM field geometries

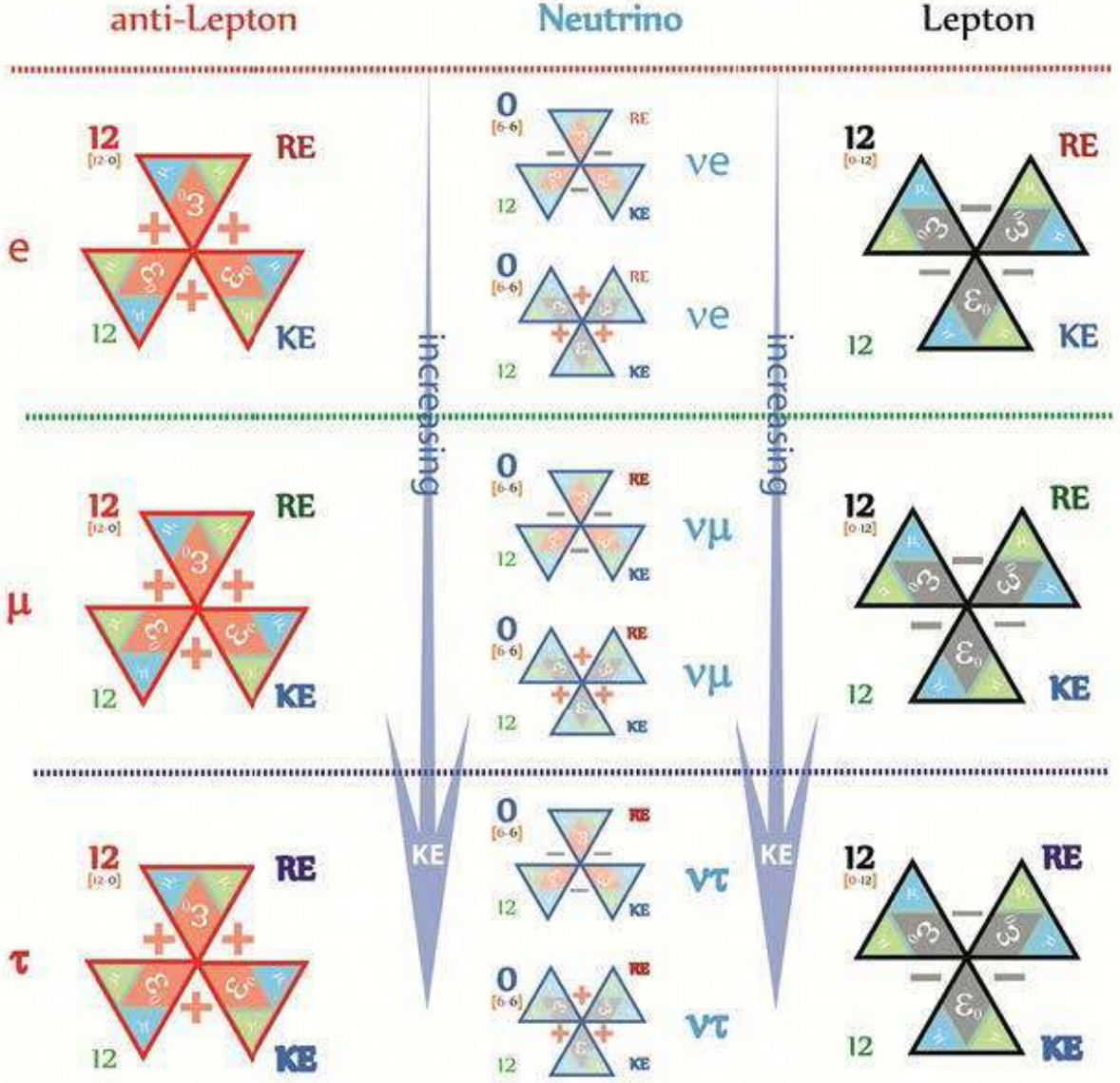
Charged mass-energy geometries form elementary particle topologies

12π

$KEM = Mv^2$

Total relativistic mass-energies
[rest Matter + KEM]

All high mass-energy particles 'decay' into low mass-energy particles by emitting photons



Note: All Lepton geometries are the same size - only the energy density of the EM field changes

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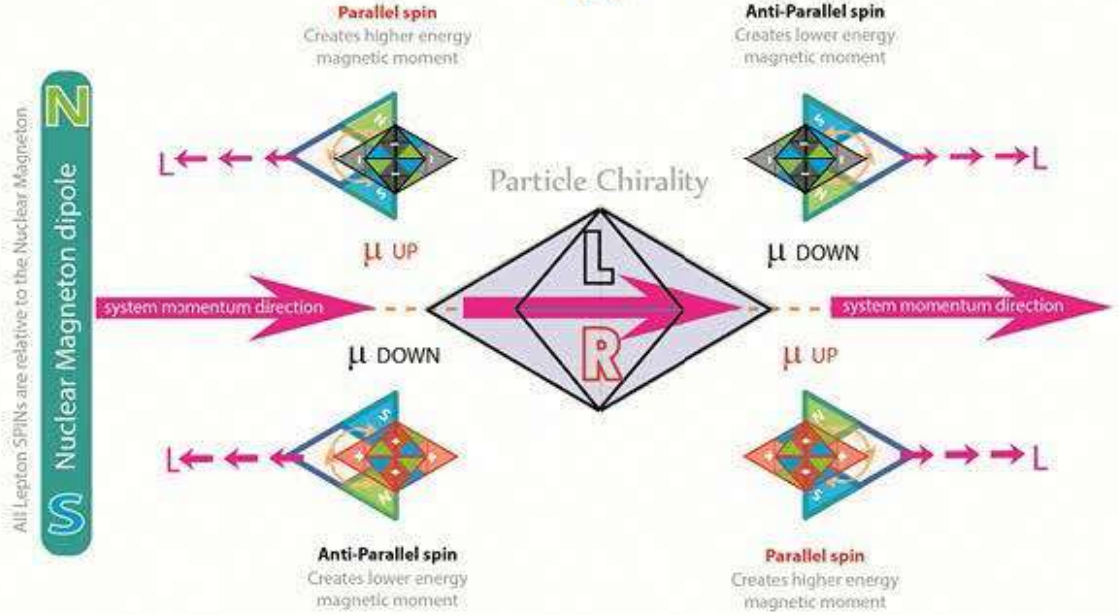
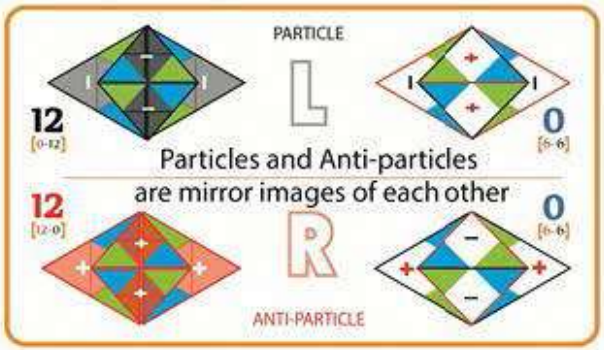
Lepton Helicity and Chirality

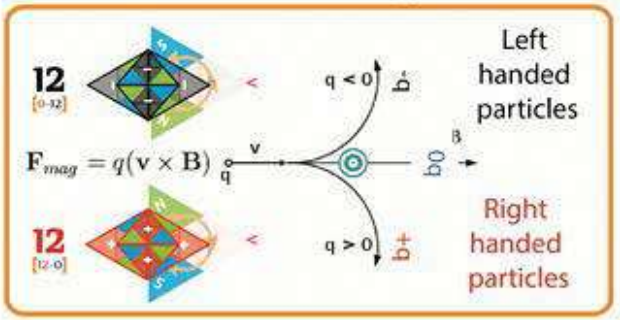
Particle Spin and Handedness is always referenced
with respect to the direction of nett total system linear Momentum



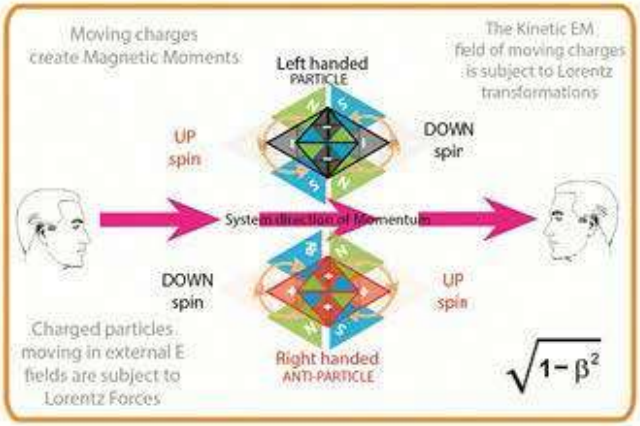
Particle Chirality



Particle Helicity



Lorentz Force and Transformation



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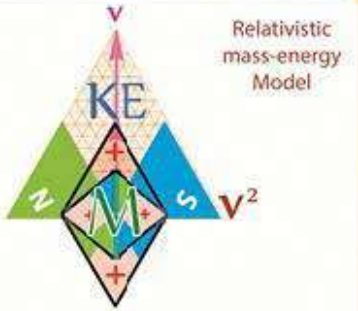
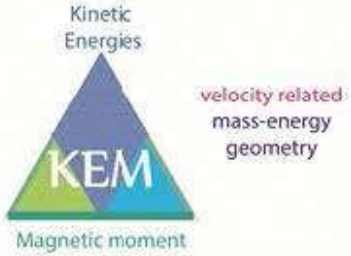
'Point Charges'

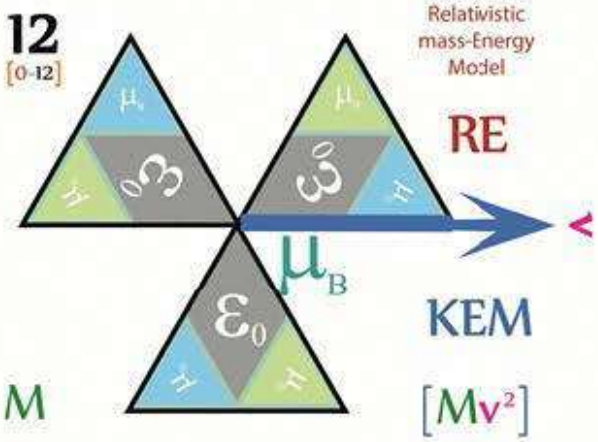
The only true 'point charges' are Zero Point Fields

Static charge particles have neutral M Fields
Charges in motion have magnetic moments

Positive Particles



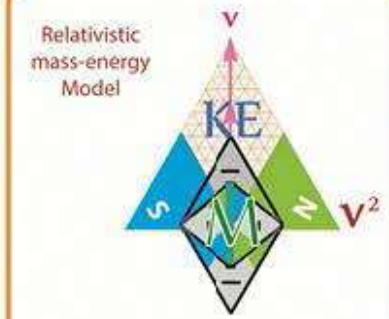


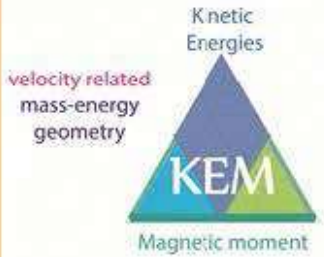


It is the Kinetic EM field geometry of charged Matter topologies in motion that produces Magnetic Moments

[not a relativistic distortion of spherical charge topologies]

Negative Particles





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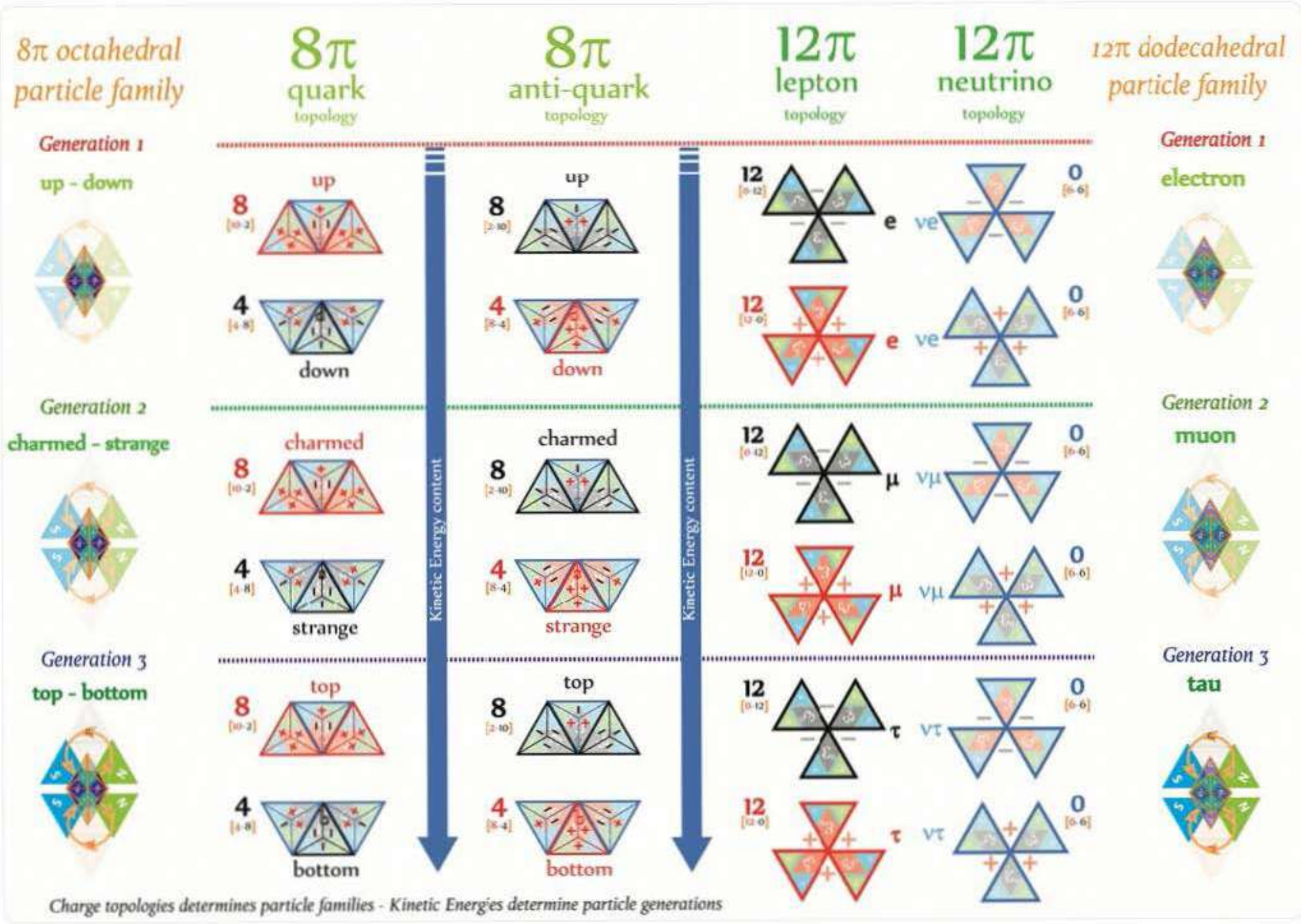
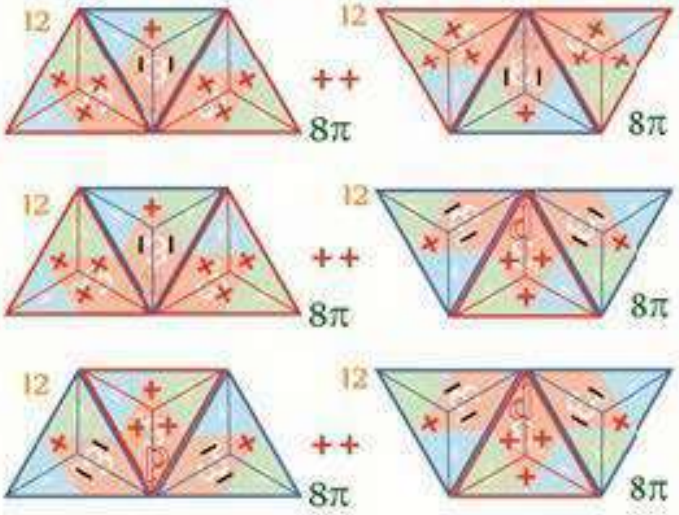


Mesons

are 24π subatomic mass-Matter particles composed of one quark and one antiquark

$$24\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(24π Mesons; $\varepsilon_0\mu_0$: EM Field, ElectroMagnetic; m: Planck quanta, mass; Ω: quanta; v²: velocity)



+16 [20-4]

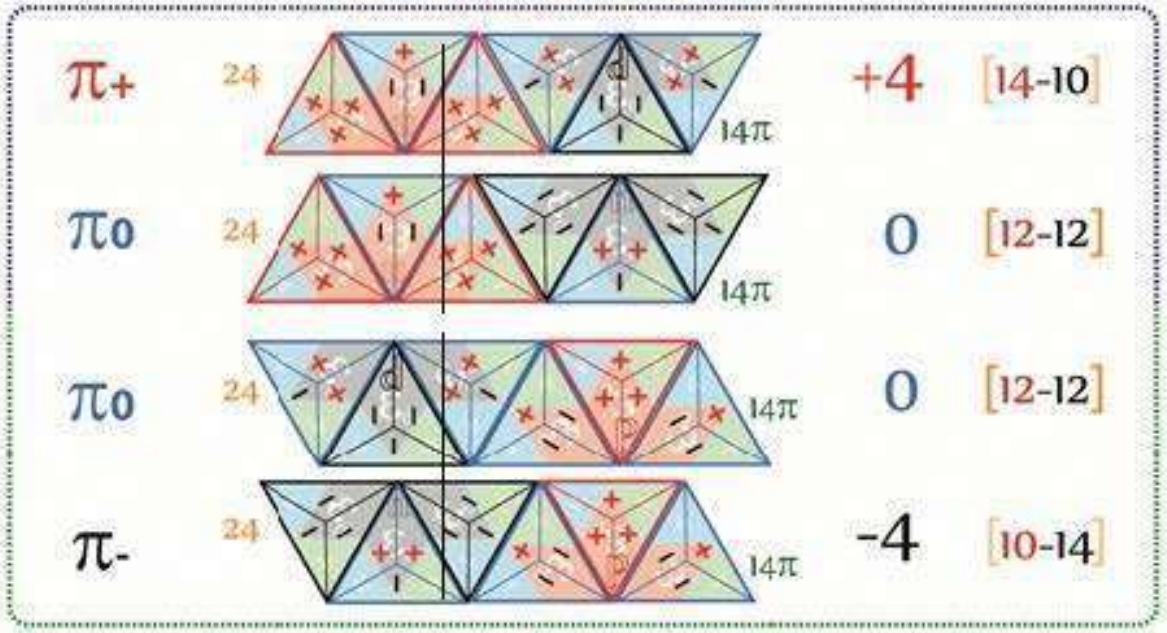
+12 [18-6]

+8 [16-8]

prevented by strong repulives forces

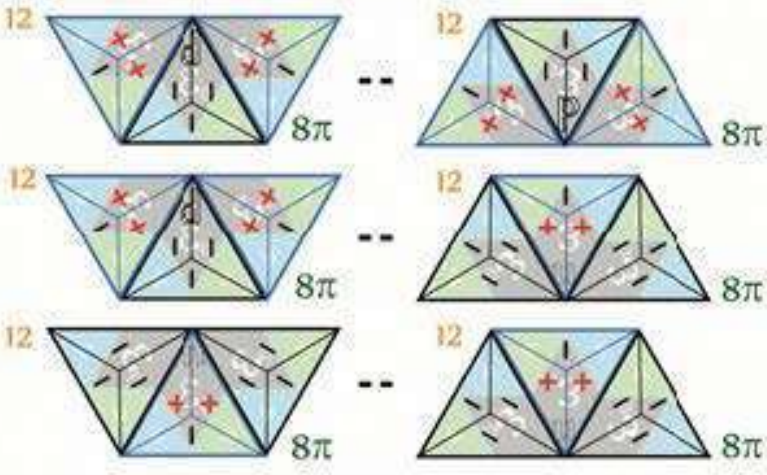
24π charged mass-energy fascia geometries

Pions



Short lived combinations

14π final mass-Matter topologies



-8 [8-16]

-12 [6-18]

-16 [4-20]

prevented by strong repulives forces

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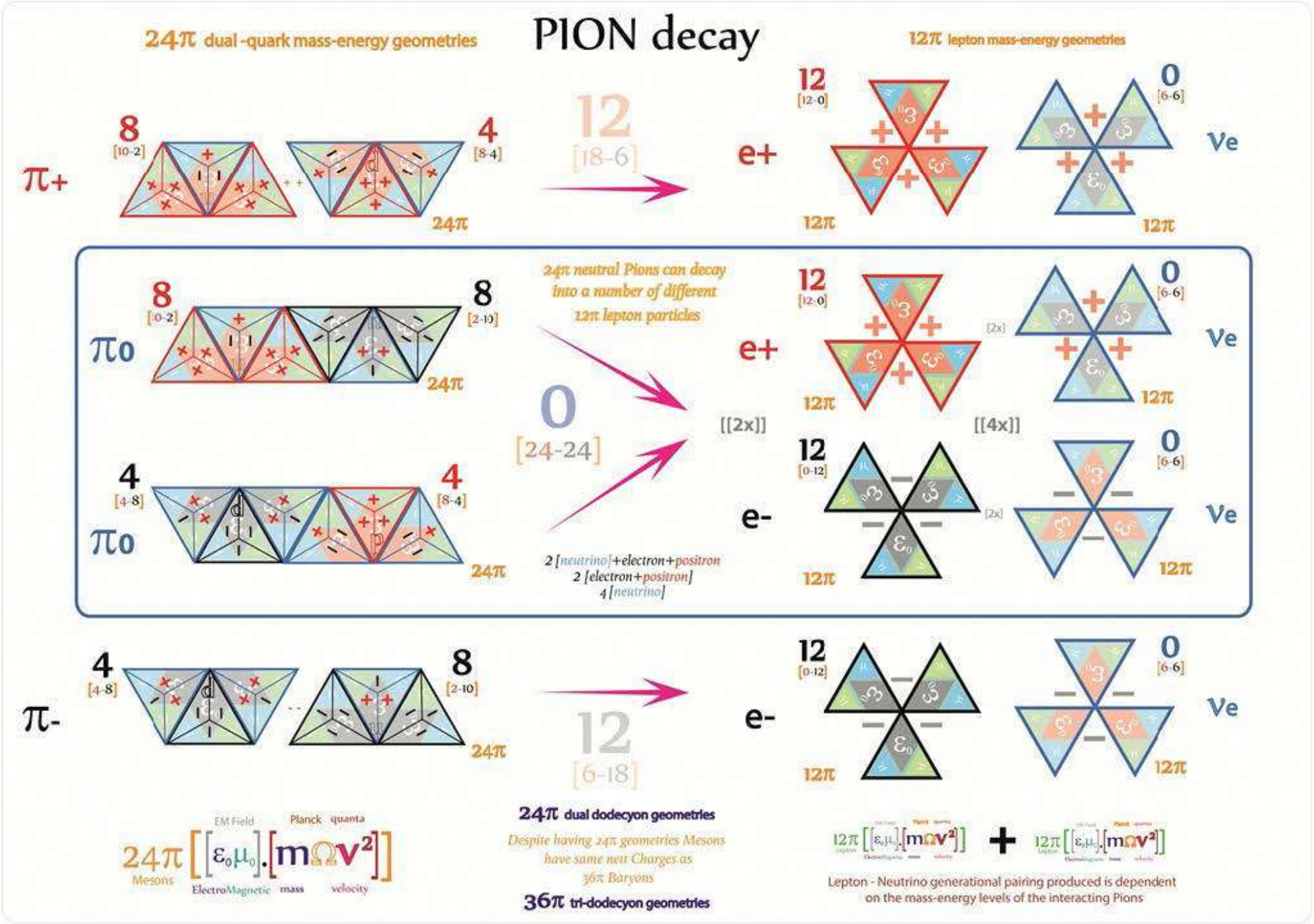

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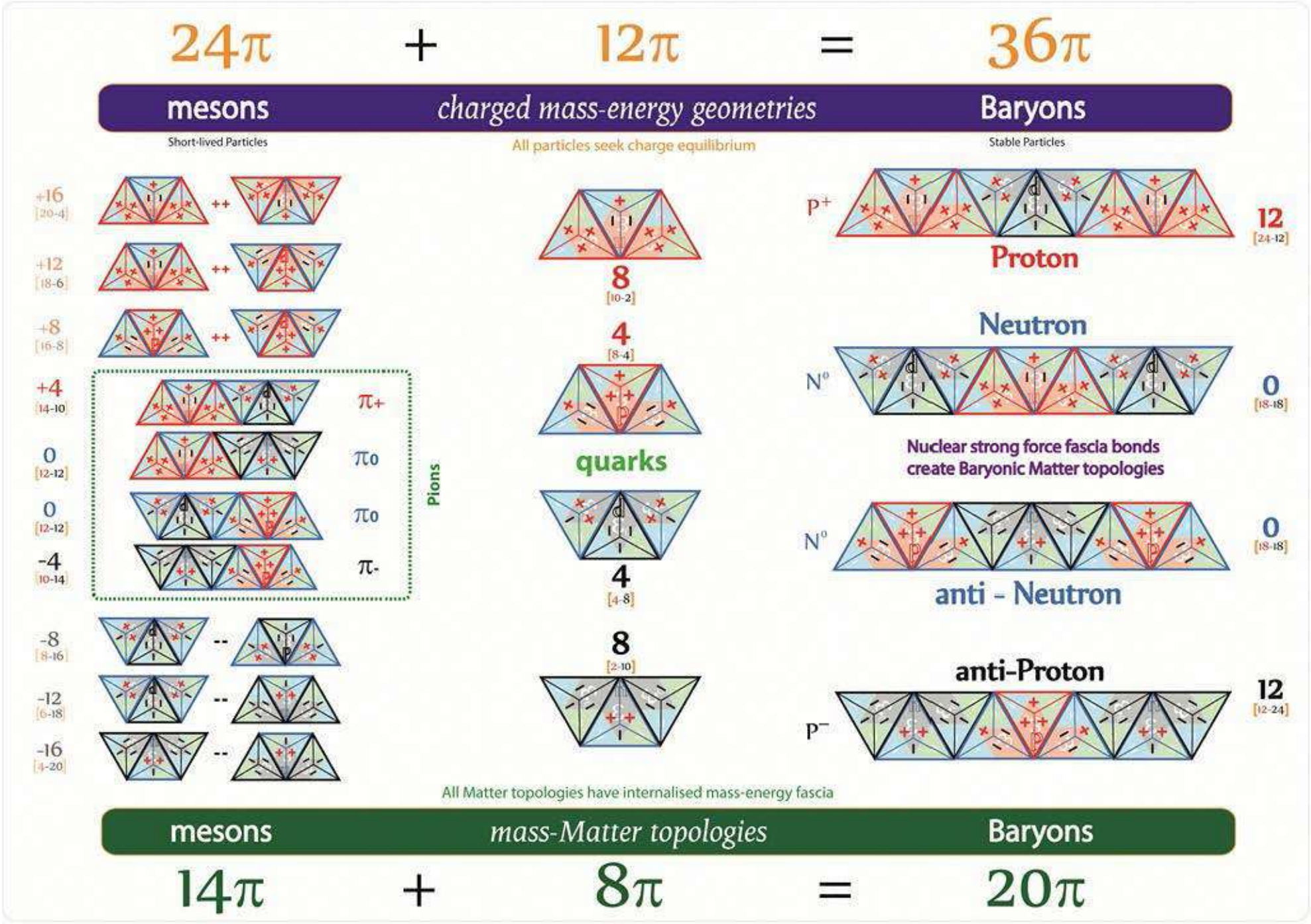

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Baryons

Baryons are 36π mass-energy geometries

$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Baryons — ElectroMagnetic (EM Field) — mass — velocity — Planck quanta

Double Charmed Xi

Charmed Sigma

Lambda

12
[24-12]

Double Bottom Xi

P^+

Proton

-1

Bottom Xi

Charmed Bottom Omega

Bottom Omega

Bottom Lambda

+1

Neutron

-2

0
[18-18]

N^0

Bottom Sigma

Charmed Omega

Charmed Bottom Omega Prime

+2

0
[18-18]

$\overline{N}^0$

0

Anti - Neutron

Charmed Xi Prime

Charmed Lambda

Double Charmed Omega

Xi

Bottom Xi Prime

Anti-Proton

12
[12-24]

P^-

Sigma

Double Bottom Omega

that result in 20π mass-Matter topologies

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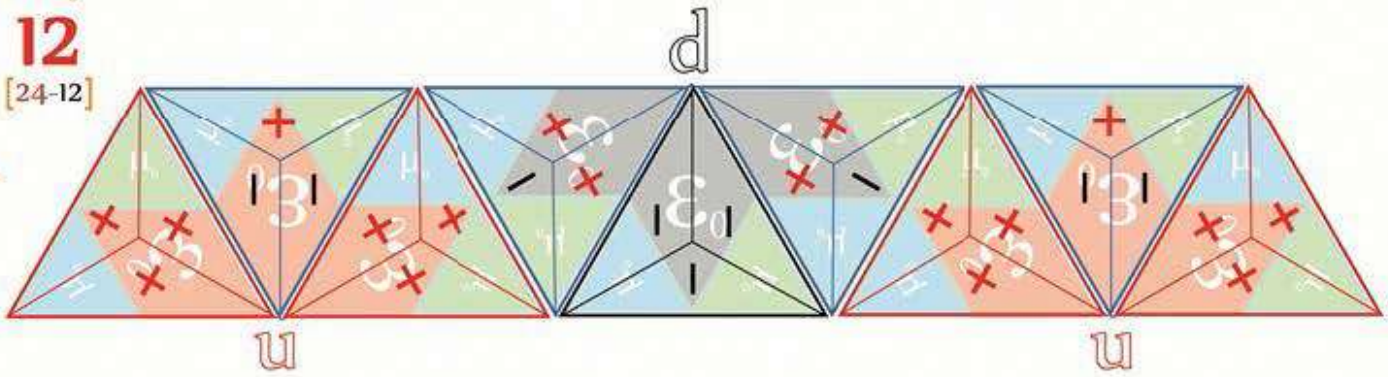
Proton

net charge

12

[24-12]

p^+



charged mass-energy geometries

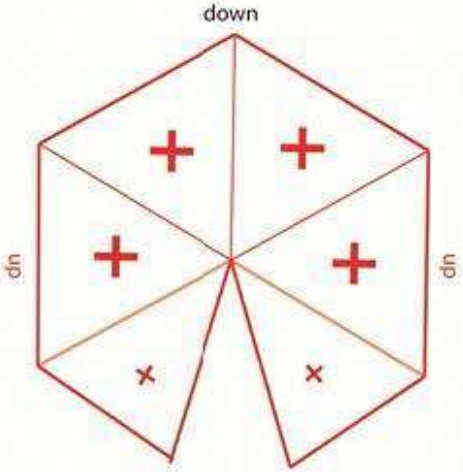
36π

Tri-quark mass-energy geometry

$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

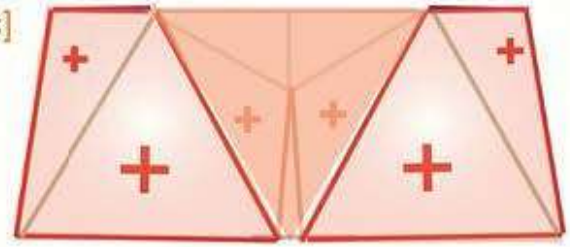
Baryons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Baryon mass-Matter topology



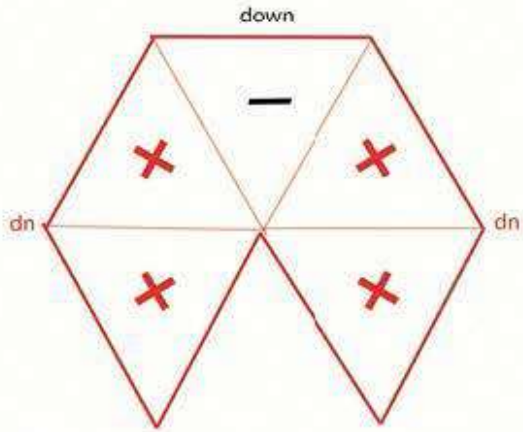
12

[24-12]



20π

charged mass-Matter topology



Proton

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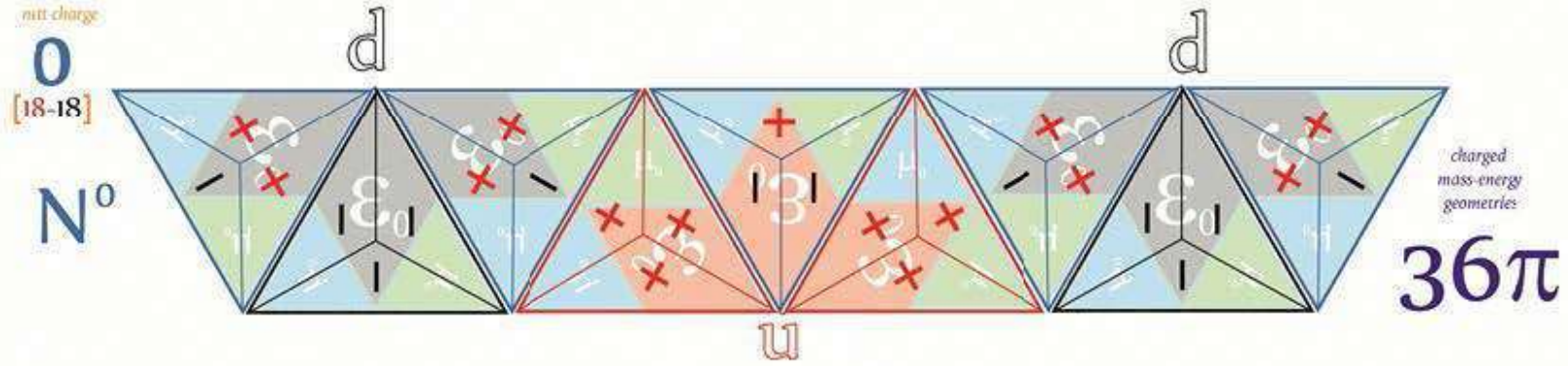
Neutron

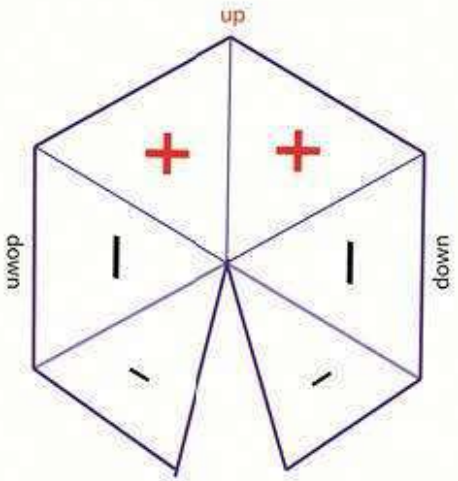


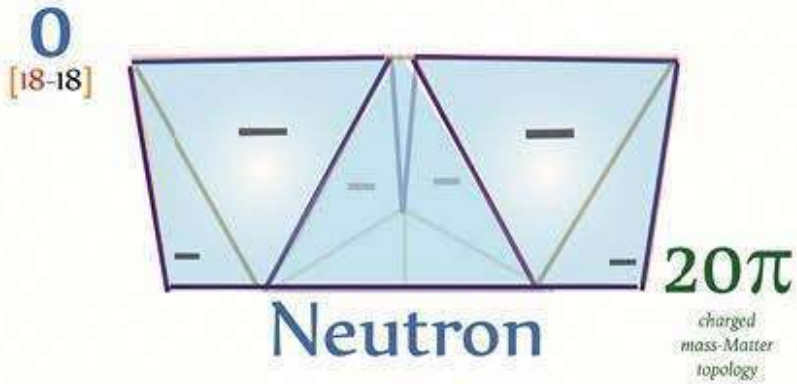
Tri-quark mass-energy geometry

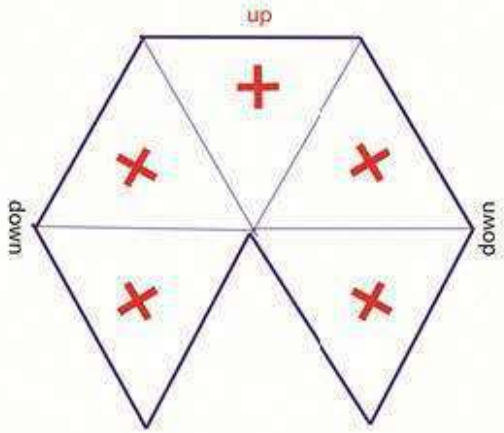
$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Baryons — EM Field: ElectroMagnetic; Planck quanta: mass, velocity

Baryon mass-Matter topology







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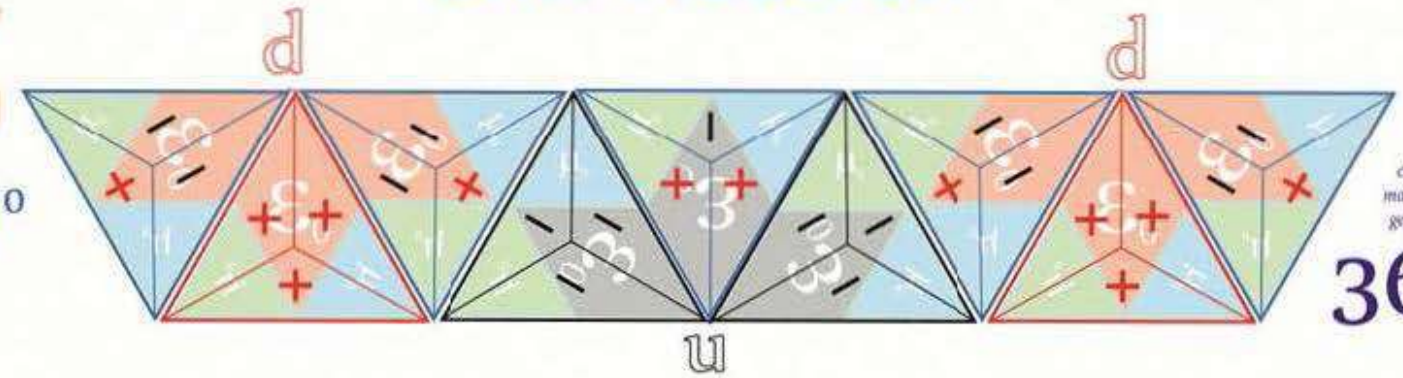
anti-Neutron

net charge
0
[18-18]

N°



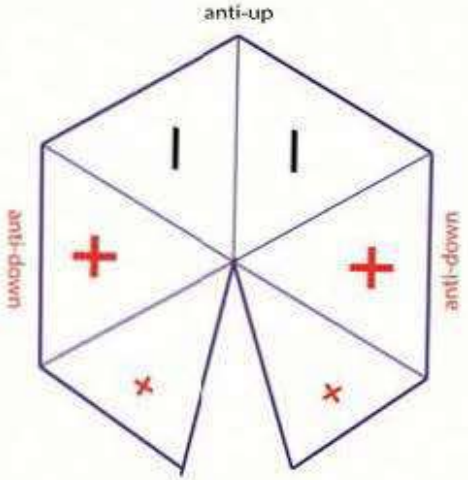
charged
mass-energy
geometries
36π

Tri-quark mass-energy geometry

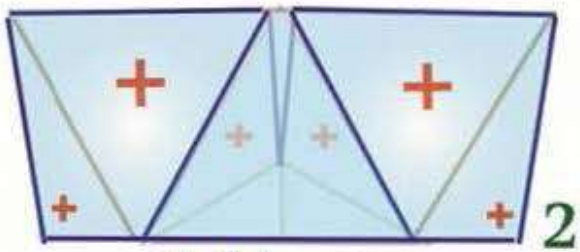
$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Baryons
EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic)
Planck quanta: $m\Omega v^2$ (mass, velocity)

Baryon mass-Matter topology



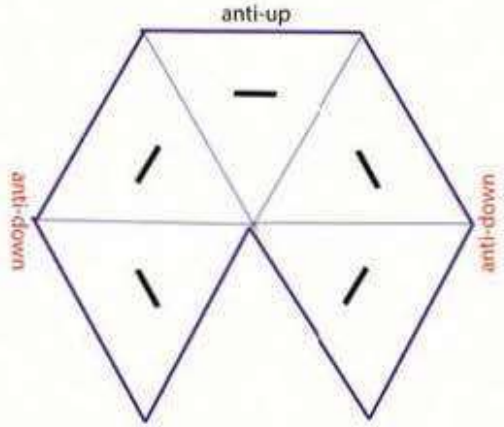
0
[18-18]



20π

anti-Neutron

charged
mass-Matter
topology



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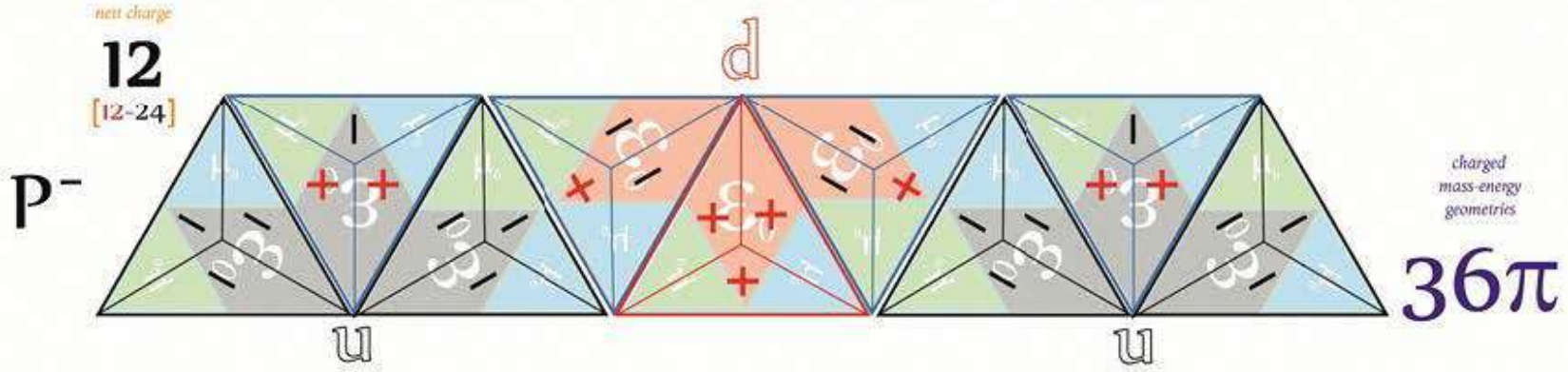
anti-Proton

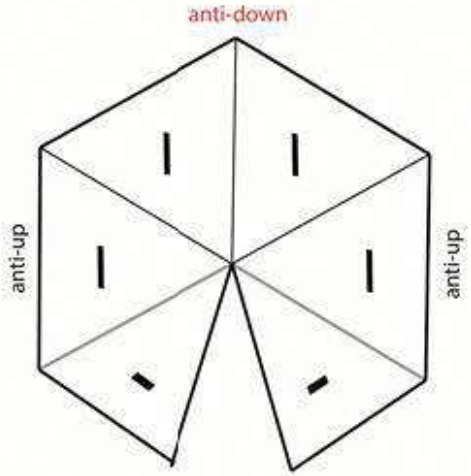


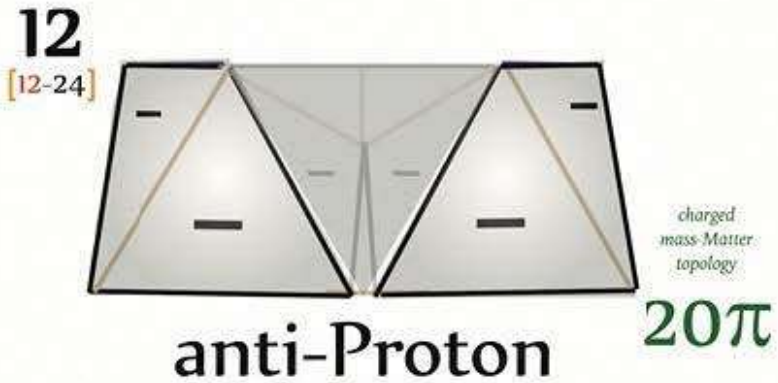
Tri-quark mass-energy geometry

$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

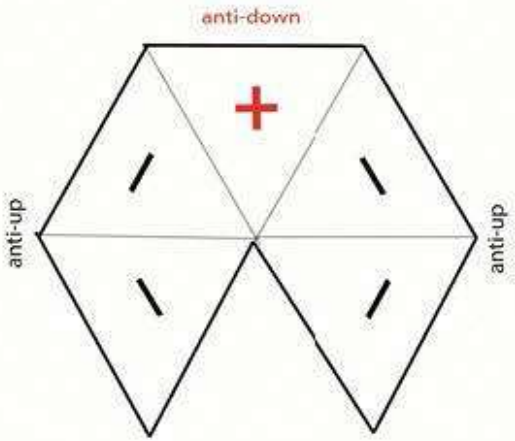
Baryons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Baryon mass-Matter topology





anti-Proton



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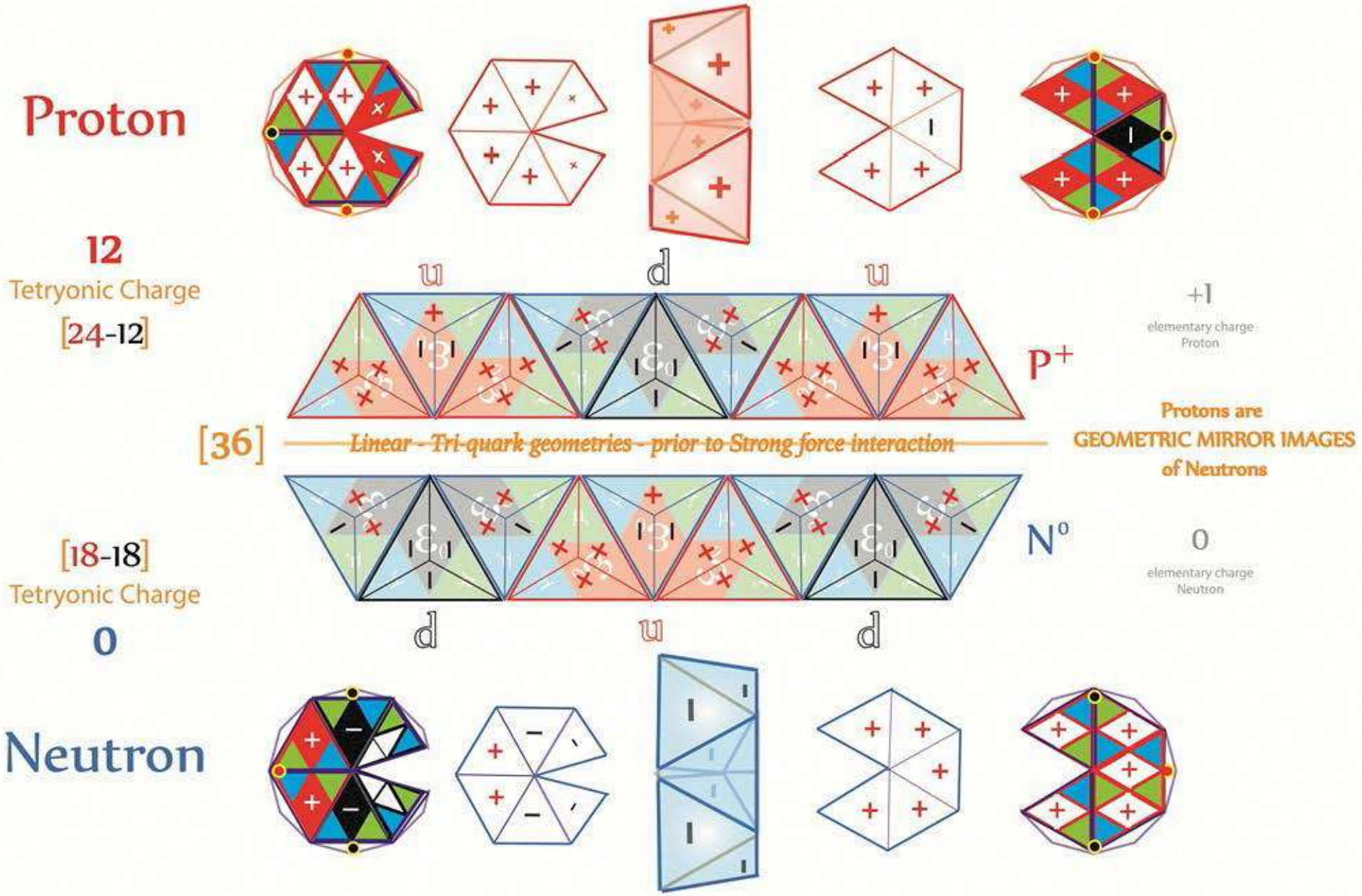
Baryon geometry



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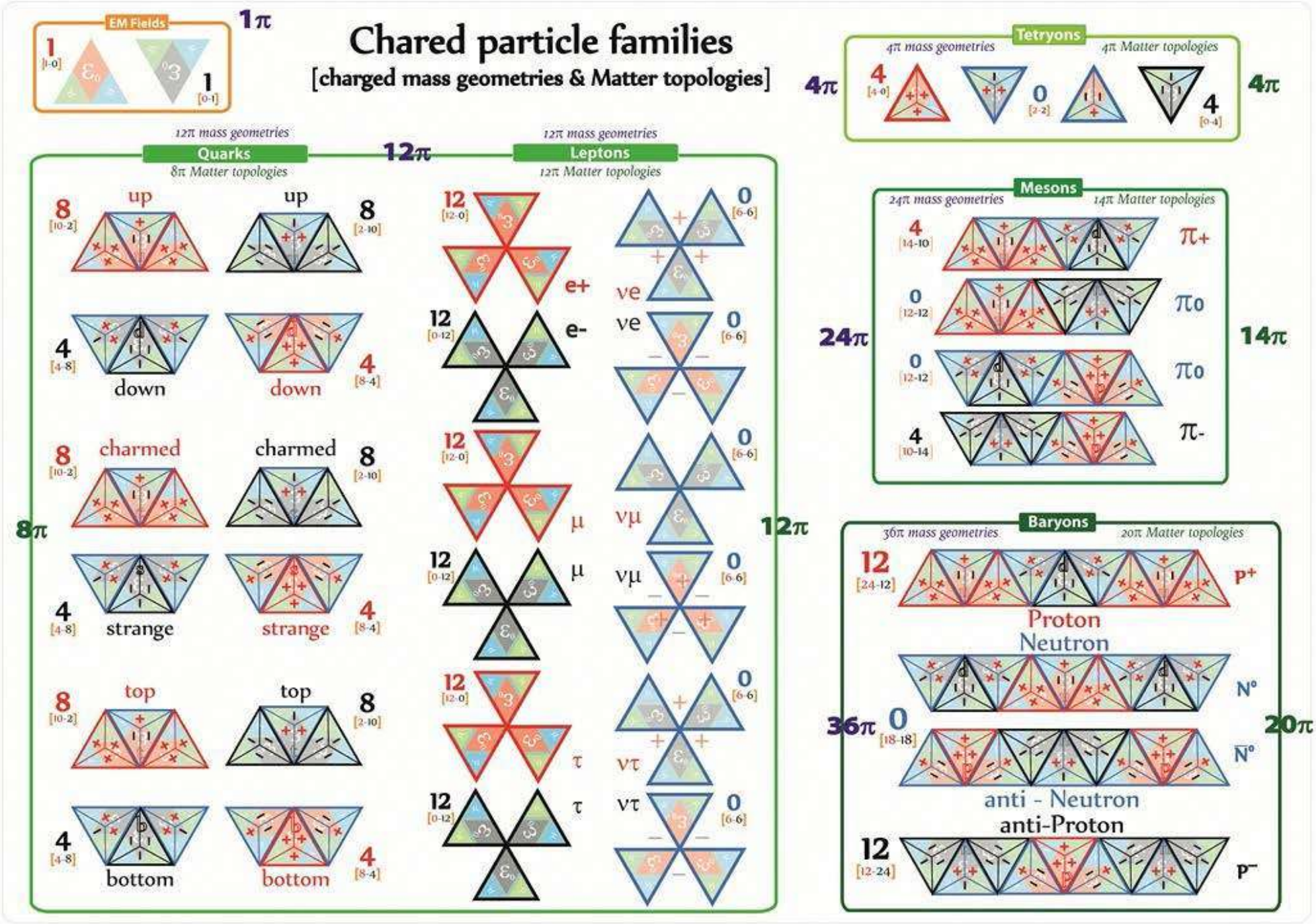

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Tetryonic Energy levels

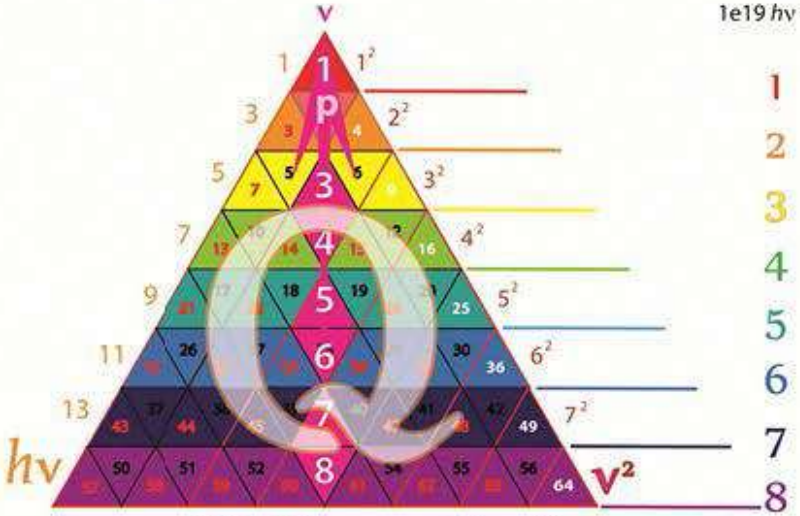
$$E = n\pi[[m\Omega v^2]]$$

Energy · Planck quanta · mass · velocity · momentum

Energy levels

$\mathbb{m}$

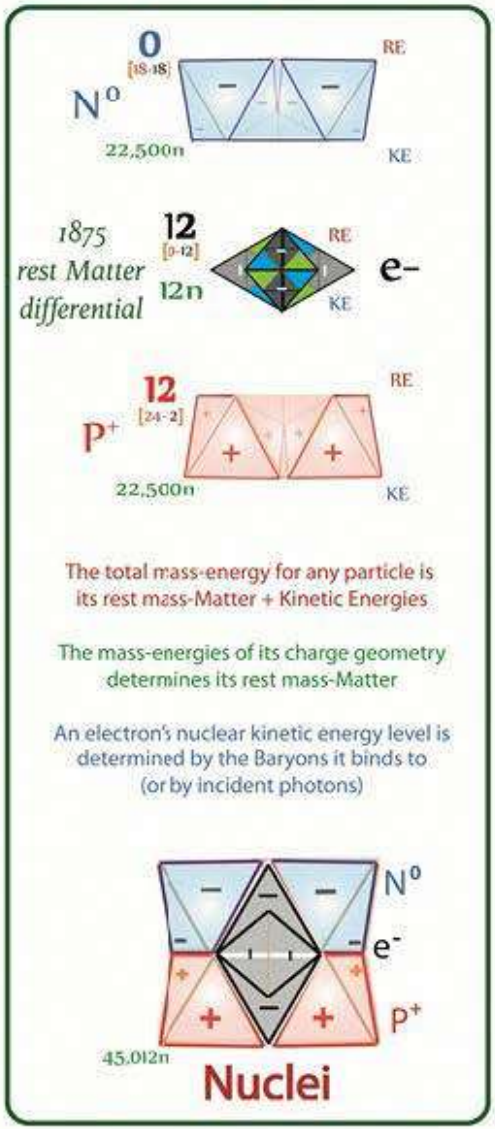
1e19 $h\nu = n$



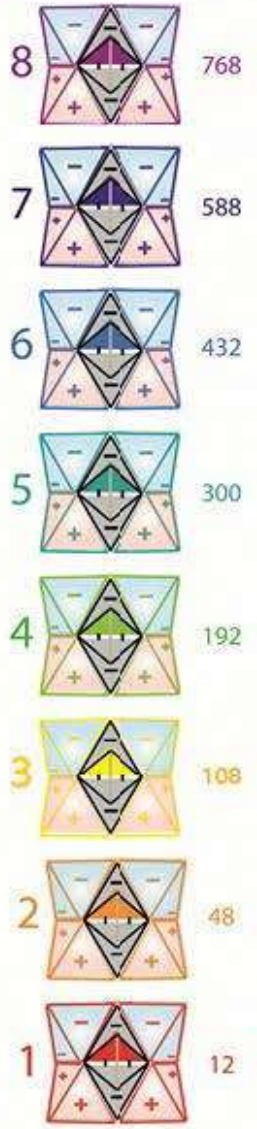
charged field quantisation

Every charged fascia of a Field or Particle holds squared energy levels
(equilateral EM mass-energy geometries & Matter topologies)

rest mass-Matter

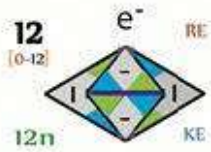


Nuclear Quantum Level · electron Kinetic Energy Level



The Tetryonic KEM Colour code

As the energy levels of atomic nuclei increase/decrease
the KEM fields of leptons bound to them change accordingly



Electron

1	2	3	4	5	6	7	8
1	4	9	16	25	36	49	64

All energy levels are Tetryonic square number quantas
ie 1, 4 , 9, 16, 25 etc (1,2,3,4,5)

$$KEM = 4\pi[[\varepsilon_0\mu_0].[m\Omega v^2]]$$

Kinetic energies · Electromagnetic · Eh Field · mass · velocity · Planck quanta

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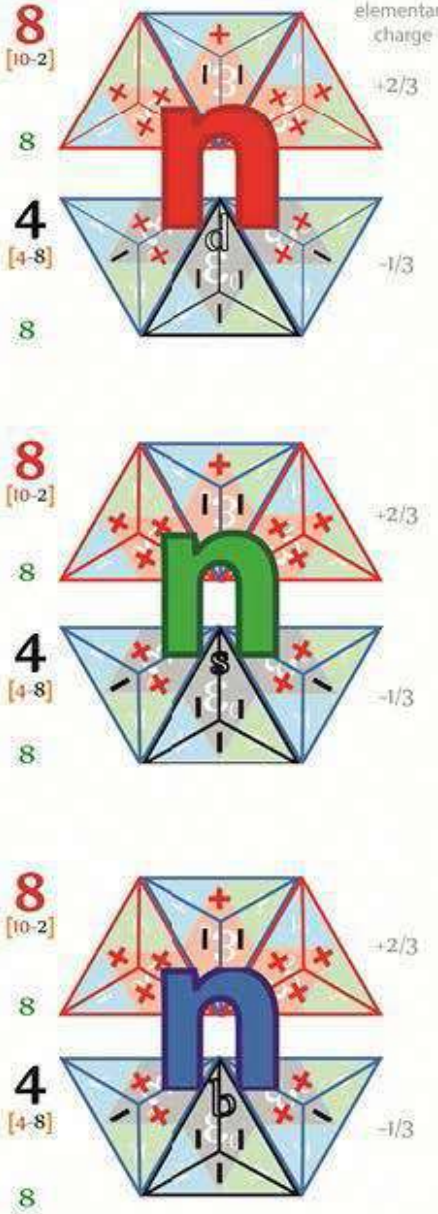
tri-quark charged toplogy combinations



Quarks seek charge equilibrium by forming Baryonic Matter topologies as a result of charge interactions [STRONG nuclear Force]

UP	gen 1
DOWN	
CHARMED	gen 2
STRANGE	
TOP	gen 3
BOTTOM	

[+8 +8 +8] [10-2] [10-2] [10-2] **24** + 2 2/3 2/3 2/3

[+8 -4 +8] [10-2] [4-8] [10-2] **12** + 1 2/3 1/3 2/3

The particle Zoo is the result of tri-quark mass-energy topologies

[-4 +8 -4] [4-8] [10-2] [4-8] **0** 0 0 1/3 2/3 1/3

[-4 -4 -4] [4-8] [4-8] [4-8] **12** - 1 1/3 1/3 1/3

Twice the number of combinations are possible with the inclusion of anti-matter topologies

$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Baryons; EM Field: ElectroMagnetic; Planck quanta: mass, velocity

Any combinations of inter-generational quarks results in differing final mass-energies in the created Baryonic Matter due to energy equalisation

The Particle Zoo

uuu	udu	ucu	usu	utu	ubu	suu	sdu	scu	ssu	stu	sbu
uud	udd	ucd	usd	utd	ubd	sud	sdd	scd	ssd	std	sbd
uuc	udc	ucc	usc	utc	ubc	suc	sdc	scc	ssc	stc	sbc
uus	uds	ucs	uss	uts	ubs	sus	sds	scs	sss	sts	sbs
uut	udt	uct	ust	utt	ubt	sut	sdt	sct	sst	stt	sbt
uub	udb	ucb	usb	utb	ubb	sub	sdb	scb	ssb	stb	sbb
duu	ddu	dcu	dsu	dtu	dbu	tuu	tdu	tcu	tsu	ttu	tbu
dud	ddd	dcd	dsd	dtd	dbd	tud	tdd	tcd	tsd	ttd	tbd
duc	ddc	dcc	dsc	dtc	dbc	tuc	tdc	tcc	tsc	ttc	tbc
dus	dds	dcs	dss	dts	dbs	tus	tds	tcs	tss	tts	tbs
dut	ddt	dct	dst	dtt	dbt	tut	tdt	tct	tst	ttt	tbt
dub	ddb	dcb	dsb	dtb	dbb	tub	tdb	tcb	tsb	ttb	tbb
cuu	cdu	ccu	csu	ctu	cbu	buu	bdu	bcu	bsu	btu	bbu
cud	cdd	ccd	csd	ctd	cbd	bud	bdd	bcd	bsd	btd	bbd
cuc	cdc	ccc	csc	ctc	cbc	buc	bdc	bcc	bsc	btc	bbc
cus	uds	ucs	uss	uts	ubs	bus	bds	bcs	bss	bts	bbs
cut	cdt	cct	cst	ctt	cbt	but	bdt	bct	bst	btt	bbt
cub	cdb	ccb	csb	ctb	cbb	bub	bdb	bcb	bsb	btb	bbb

216 possible Baryon topologies [excluding anti-matter] with each combination producing differing Baryonic nett energy levels

Quarks always form symmetrical [udu] or [dud] charged Baryonic topologies [same charges never combine except under high energy conditions] ie. Proton is a [udu] not [uud] as is commonly stated

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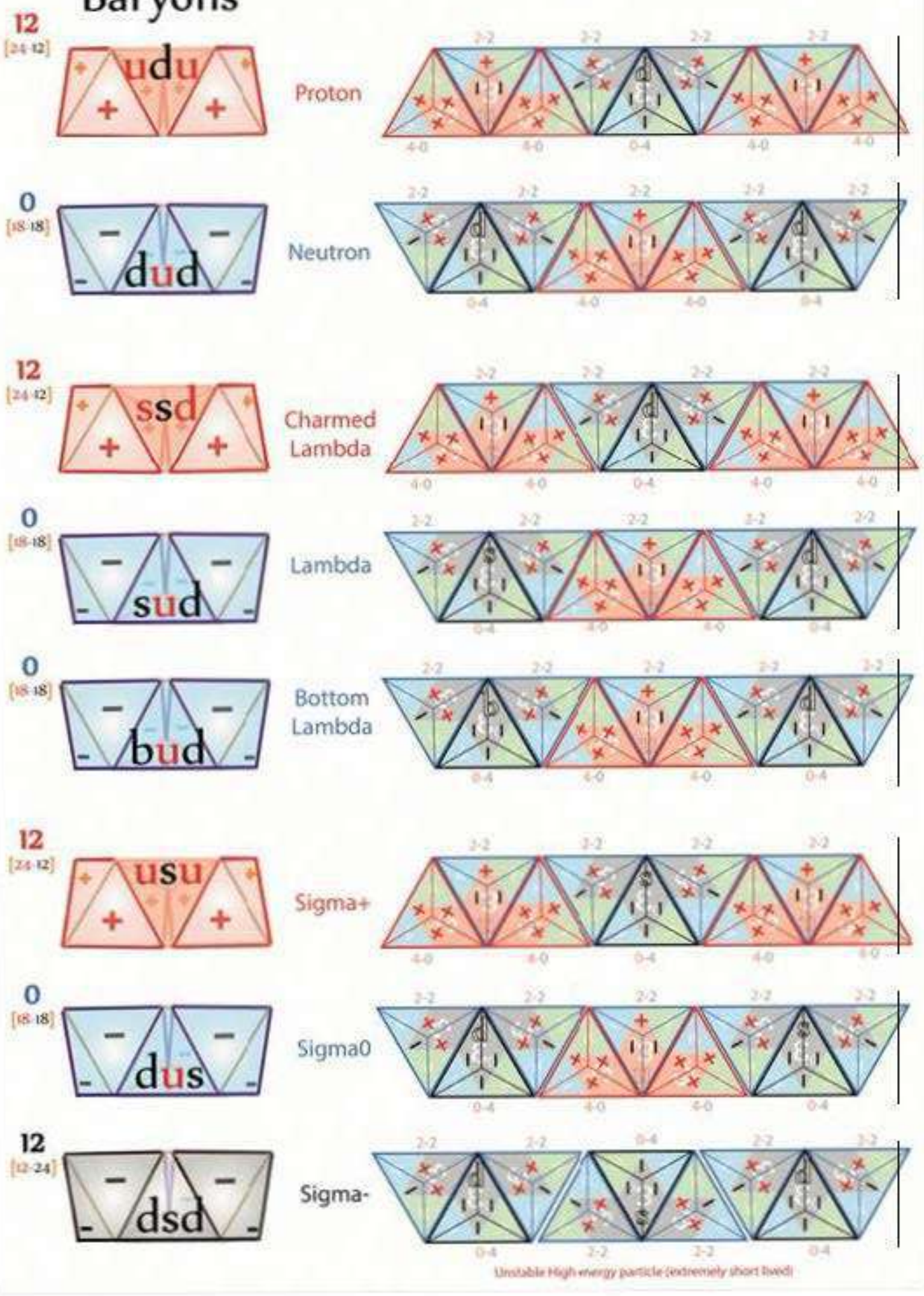
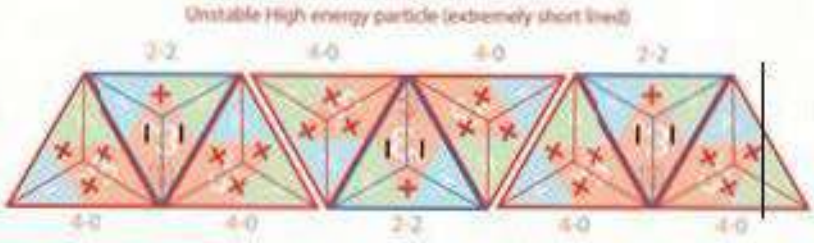
Baryons



Baryons

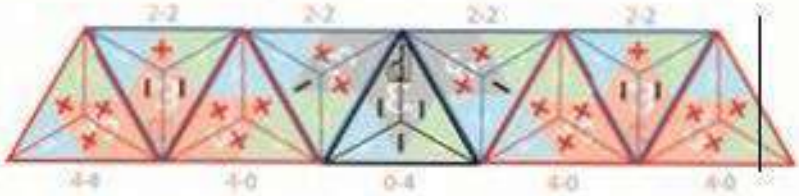
24 [30-06]

Charmed Sigma



12 [24-12]

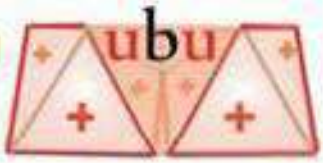
Charmed Sigma



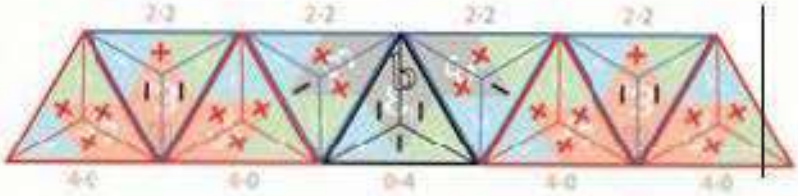
0 [18-18]

Charmed Sigma

12 [24-12]

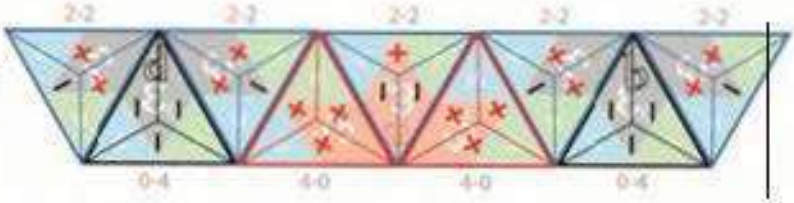


Bottom Sigma



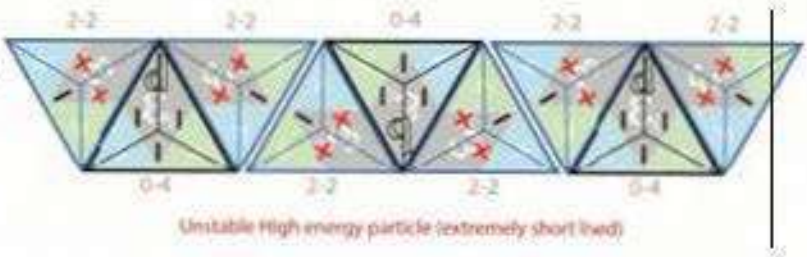
0 [18-18]

Bottom Sigma



12 [12-24]

Bottom Sigma



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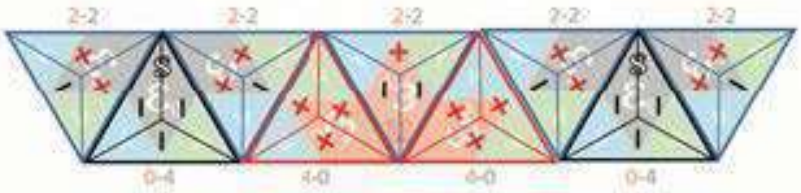
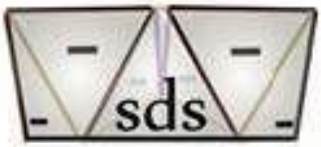
Baryons

0
[18-18]

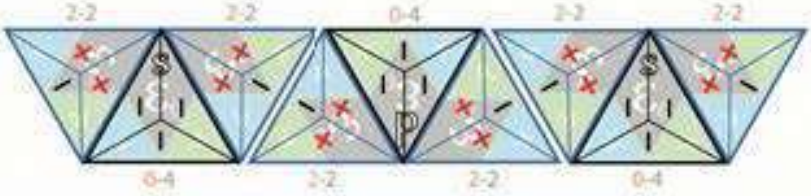
Xi



12
[12-24]



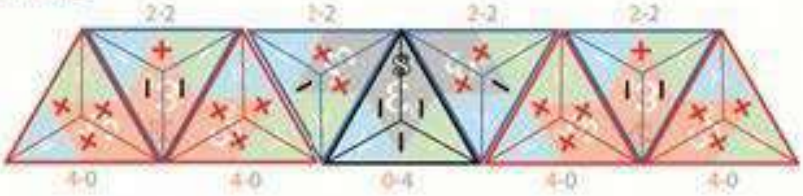
Xi



Unstable High energy particle (extremely short lived)

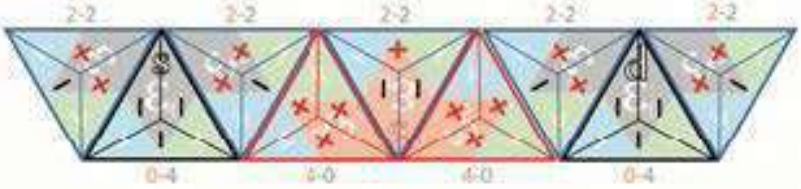
Charmed Xi Prime

12
[24-12]



Charmed Xi Prime

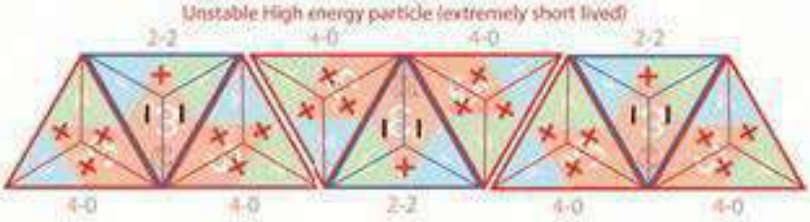
0
[18-18]



Double Charmed Xi

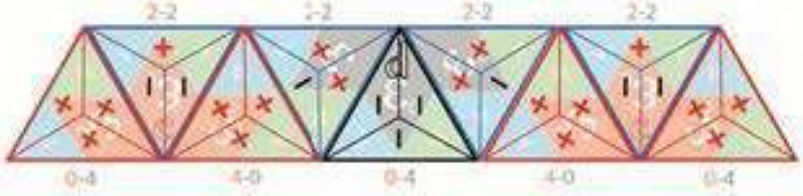
24
[30-06]

Unstable High energy particle (extremely short lived)



Double Charmed Xi

12
[24-12]



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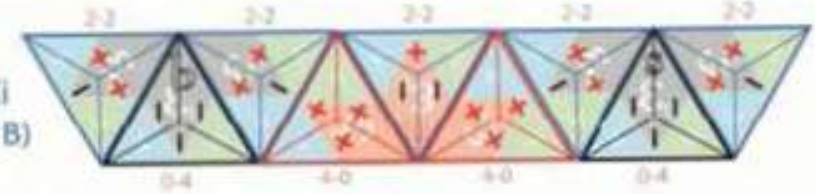
Baryons

0
[18-18]

Bottom Xi
(Cascade B)



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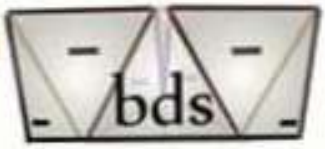
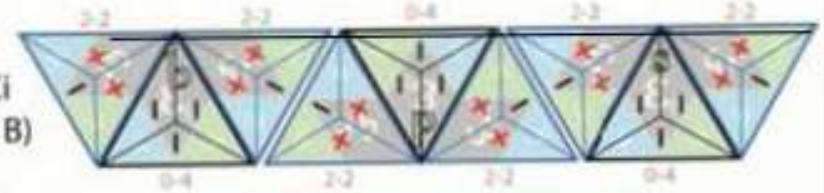
[12-24]

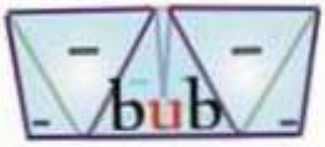


Bottom Xi
(Cascade B)



Unstable High energy particle (extremely short lived)

0
[18-18]



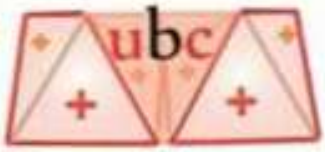
Double
Bottom Xi

12
[12-24]

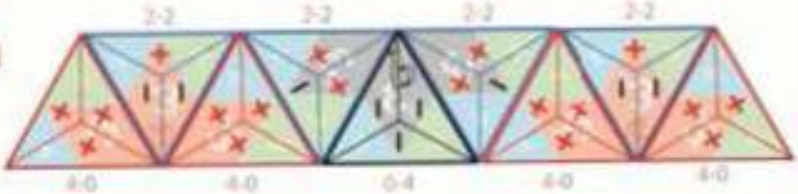
Double
Bottom Xi

Unstable High energy particle (extremely short lived)

12
[24-12]

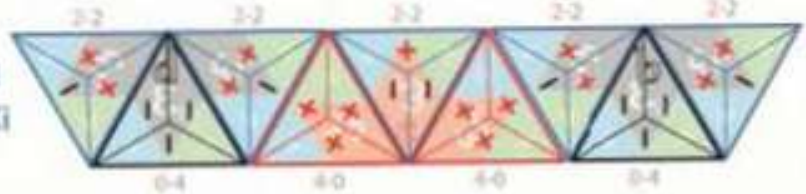


Charmed
Bottom Xi



0
[18-18]

Charmed
Bottom Xi



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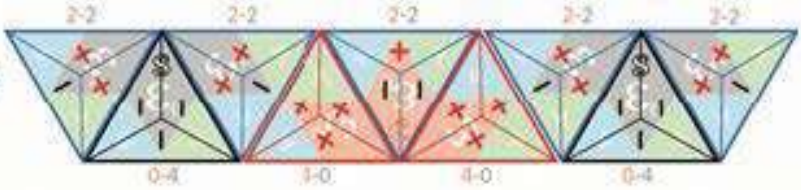
Baryons

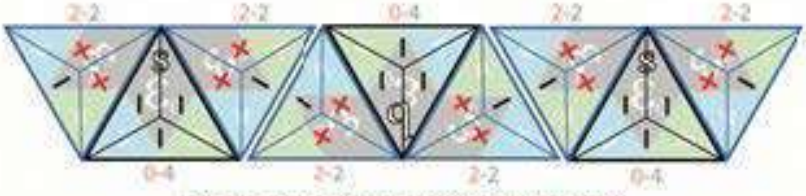
0 [18-18]

Charmed Omega



12 [12-24]

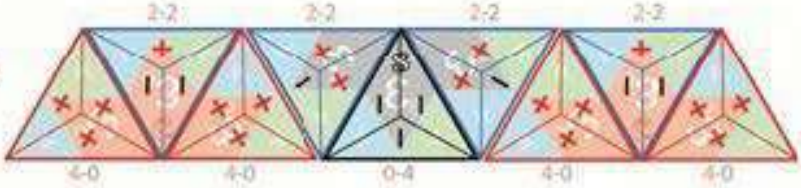
Bottom Omega



Unstable Highenergy particle (extremely short lived)

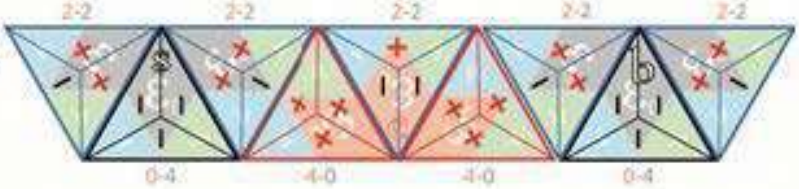
12 [24-12]

Double Charmed Omega



0 [18-18]

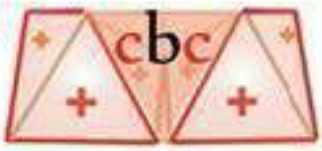
Charmed Bottom Omega



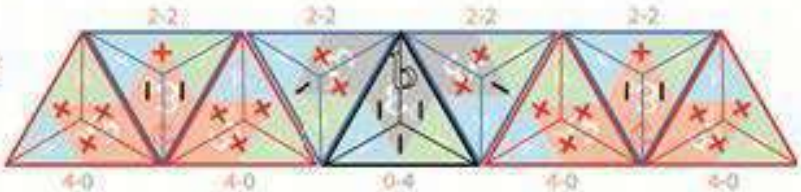
12 [12-24]

Double Bottom Omega

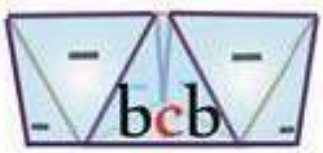
12 [24-12]



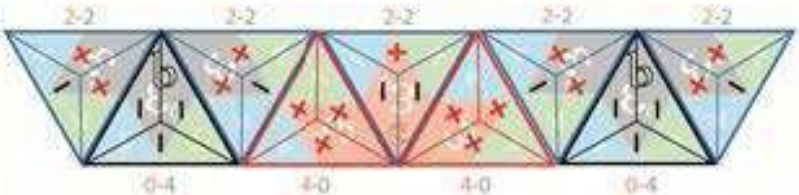
Double Charmed Bottom Omega



0 [18-18]



Charmed Double Bottom Omega



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ZPF

Photons

Bosons

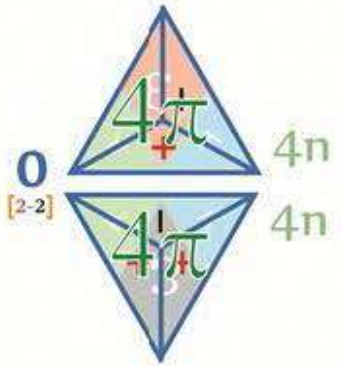
Tetryons

nπ charged mass-Energy-Matter geometries

Ω

ZPFs are the quantum of Bosons

Q



Ʊ

All energies seek equilibrium

Q

Energy momenta

$$n\pi\left[\left[m\Omega v\right]^2\right]$$

Energy; Planck quanta; mass; velocity

EM mass-Energies

$$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

mass-energy; EM Field; ElectroMagnetic; Planck quanta; mass; velocity

Charges

$$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Charge; EM Field; ElectroMagnetic; Planck quanta; mass; velocity

Matter

$$4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Matter; EM Field; ElectroMagnetic; Planck quanta; mass; velocity

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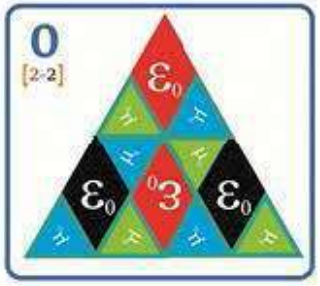
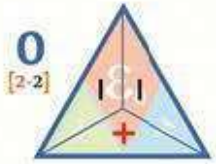
Gluons

The gluon can be considered to be the fundamental exchange particle facilitating the strong interaction between protons and neutrons in a nucleus.

Gluons are the exchange particles for the 'colour' strong force between quarks, analogous to the exchange of photons in the electromagnetic force between two charged particles.

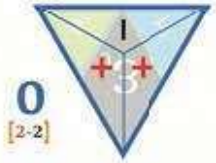


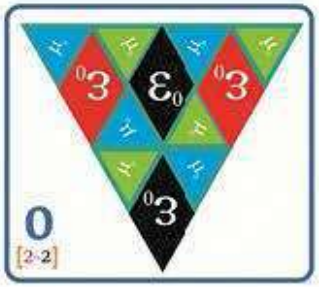


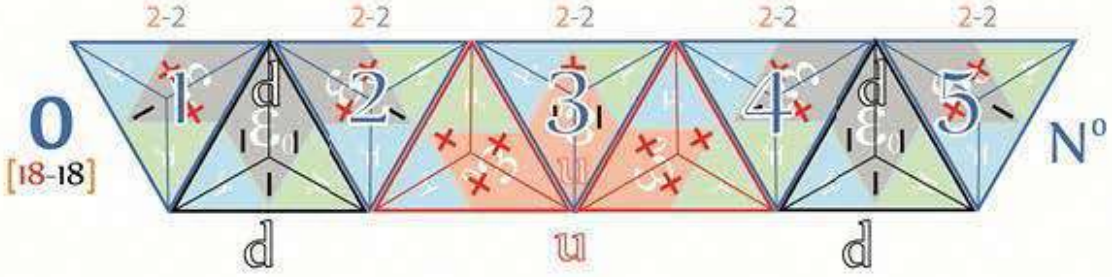
Ω

Gluons are considered to be bi-coloured, carrying a unit of colour and a unit of anti-colour

℧

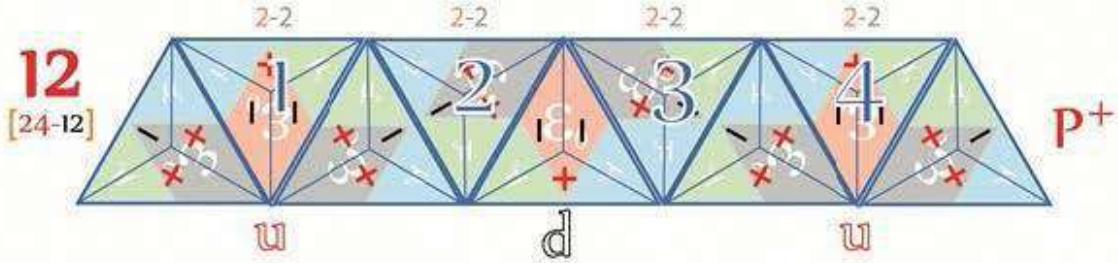






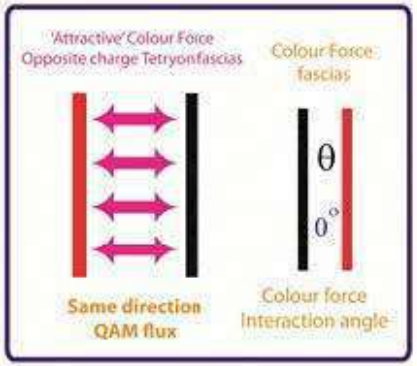
Q

Gluons are the neutral Tetryons inside all fermionic Matter topologies



They are the neutral charge [di-electric] Tetryons located between charged Tetryons in Matter topologies

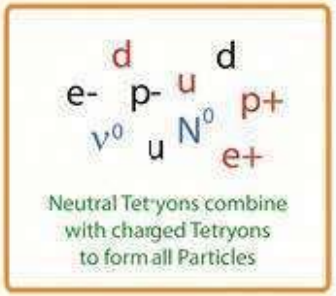
[attractive coulombic forces between their opposite charged fascia create the 'colour force]



The interaction between neutral Tetryons (Gluons) and all charged Tetryons is the Strong Colour force

nett charge of Gluons is same as a Neutron

Electrons contain no Gluons



Neutral Tetryons combine with charged Tetryons to form all Particles

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Gluons in Fermions

In the Standard model Gluons have no mass and no electric charge.
They carry a special 'colour charge' property that hold quarks together to form Baryons

Tetryonics reveals that gluons are neutral charge tetryons comprised of equal positive & negative mass-energies & are elementary Matter particles

'Gluons' are neutral tetryons

u 8 [10-2] 8

d 4 [8-4] 8

$4\pi\,\text{Gluons}\,[[\varepsilon_0\mu_0].[m\Omega v^2]]$

EM Field · Planck quanta
ElectroMagnetic · mass · velocity

d 4 [4-8] 8

u 8 [2-10] 8

up Quarks have 1 Gluon
[Neutral Tetryon]

anti-down Quarks have 2 Gluons
[Neutral Tetryons]

GLUONS
are the neutral tetryons in Matter topologies acting as a di-electric between charged tetryons

down Quarks have 2 Gluons
[Neutral Tetryons]

anti-up Quarks have 1 Gluon
[Neutral Tetryon]

Neutrinos are 3 Gluon sets

0 [6-6]

2 + 3 + 1 = 12

ve

$12\pi\,\text{Glueballs}\,[[\varepsilon_0\mu_0].[m\Omega v^2]]$

EM Field · Planck quanta
ElectroMagnetic · mass · velocity

0 [6-6]

1 − 2 − 3 = 12

ve

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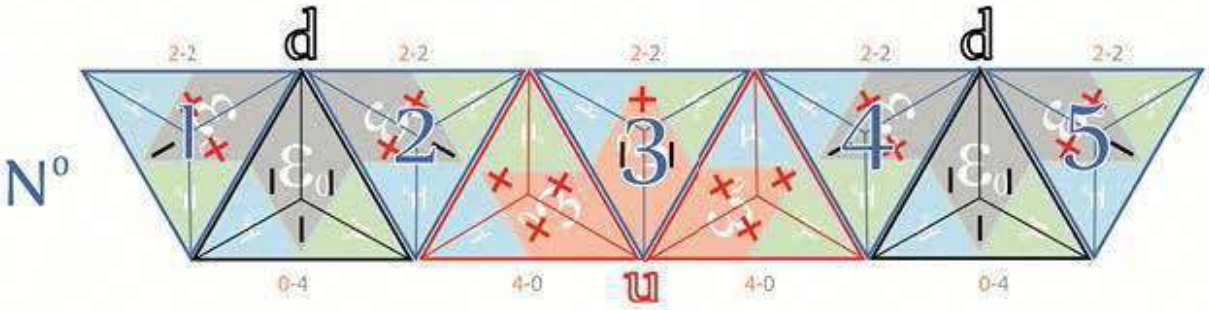
Baryonic Gluons

In 'the Standard Model', Gluons are vector gauge bosons that mediate strong interactions of quarks in quantum chromodynamics (QCD). Unlike the electrically neutral photon of quantum electrodynamics (QED), gluons themselves carry colour charge and therefore participate in the strong interaction in addition to mediating it, making QCD significantly harder to analyze than QED.

They are considered to be elementary particles which act as the exchange particles (or gauge bosons) for the colour force between quarks, analogous to the exchange of photons in the electromagnetic force between two charged particles

Tetryonics simplifies the current definition of Gluons and clearly identifies their geometric properties, along with their role in particle genesis



Neutrons have 5 Gluons

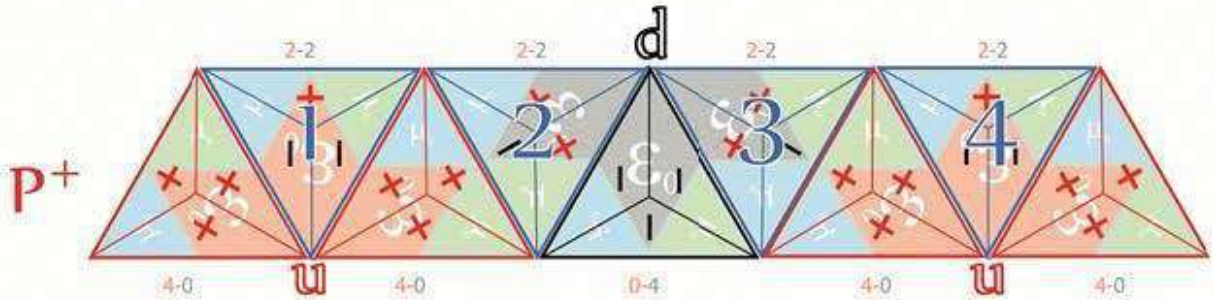
[Neutral Tetryons]

0

[18-18]

9 neutral [18-18] tetryons

Deuterium nuclei (being the constituent quanta of all Elements) have 9 neutral Tetryons (Gluons) which in turn contribute to their gravitational mass along with the charged Tetryons



12

[24-12]

Protons have 4 Gluons

[Neutral Tetryons]

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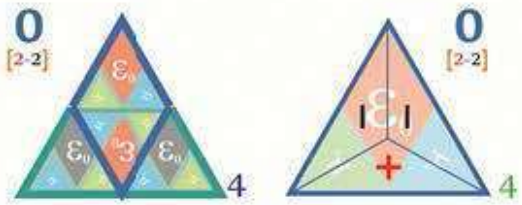
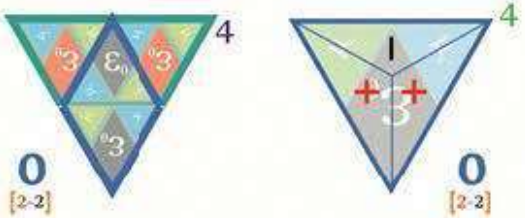
'Glueballs'

In particle physics, a glueball is a hypothetical composite particle. It solely consists of gluon particles, without valence quarks.



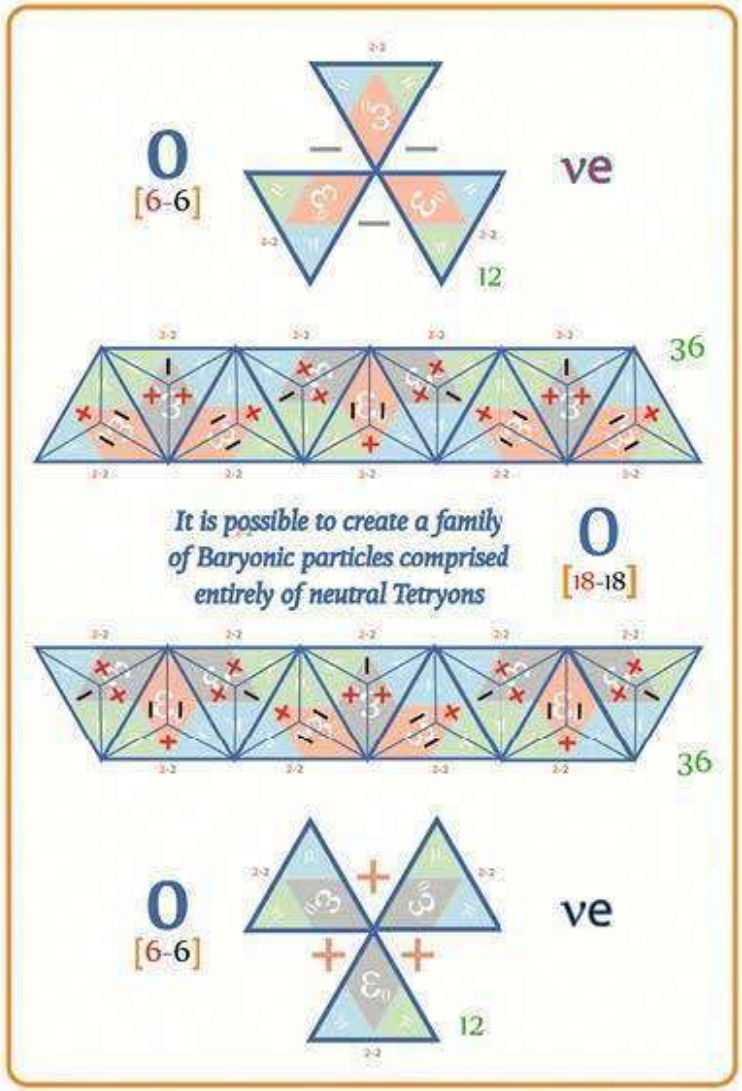
Neutral Tetryons
are the result of equal number
charged EM fields combining to form
neutral charge Tetryonic topologies



It is conceivable that given the right conditions (ie a cloud of neutral Tetryons), that in the absence of charged Tetryons to interact with, a Glueball topology can be formed entirely from neutral Tetryons

Note: Despite their total neutral charge Glueball topologies are polarised

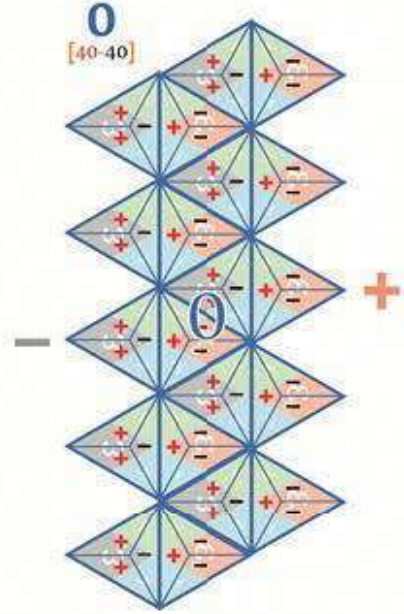
Neutrinos and some exotic neutral charge Baryons can be considered to be 'Gluon topologies'

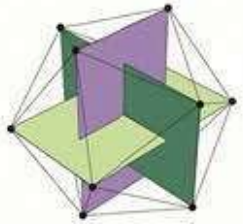


Neutrons are not considered to be Glueballs as they contain charged Tetryons

OMEGA Particle
Icosahedron Glueball

20 Neutral Teryons





The 3 internalised planes formed by the external apex points correspond with the 3 spatial dimensions of Cartesian geometry

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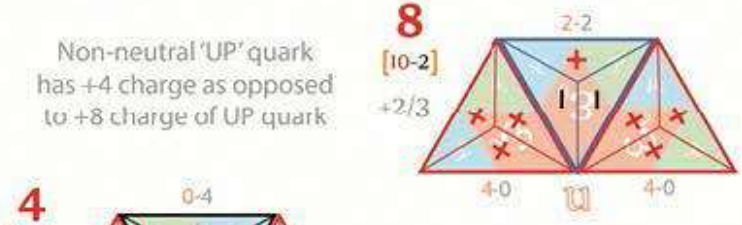
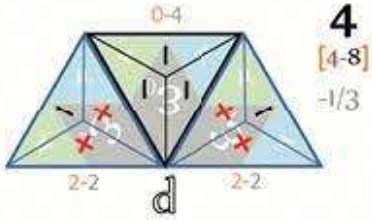
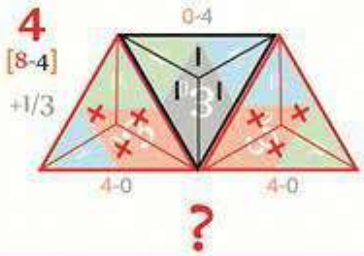
Non-gluonic Baryon formation

Non-neutral 'UP' quark has +4 charge as opposed to +8 charge of UP quark

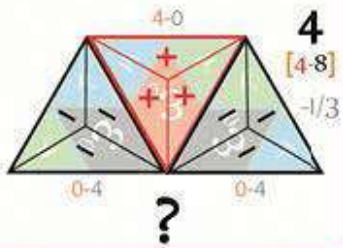


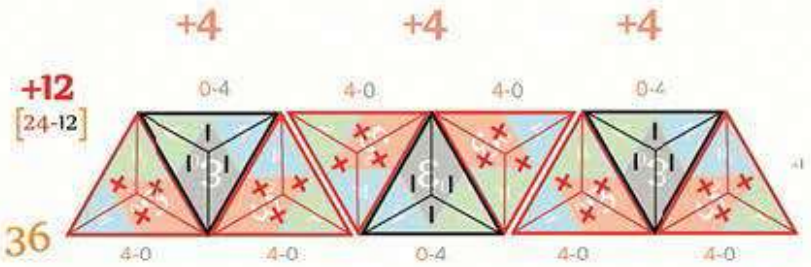


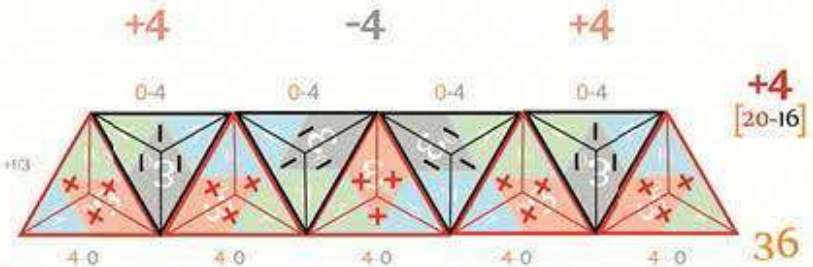
Non-neutral 'DOWN' quark has +4 charge as opposed to -4 charge of DOWN quark



Baryonic Particles can be formed with non-neutral dielectric Tetryons in lieu of the usual neutral Tetyrons [Gluons] - altering the nett charges of the quarks formed



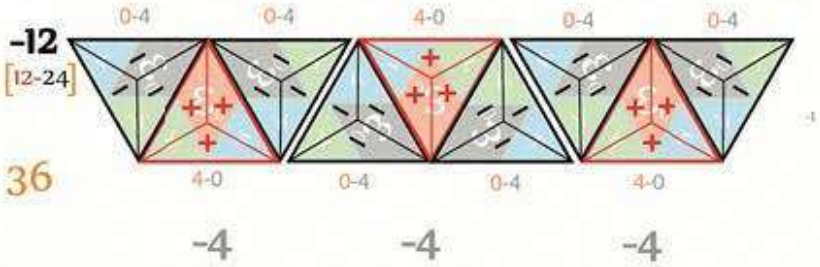




Resulting in another family of Baryons [CHARGEBALLS]

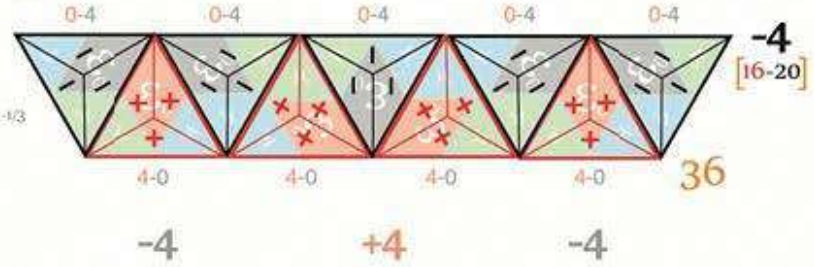
Un-stable form

[rapidly decays into constituent Quarks]



Stable Form

[possibly mistakenly viewed as Bottom Quarks]



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Electro-Magnetic fields

Quantised Charge
is the nett geometry of mass-Energy-Matter formed by equilateral ElectroMagnetic fields and can be modelled with classical vector flux rotations

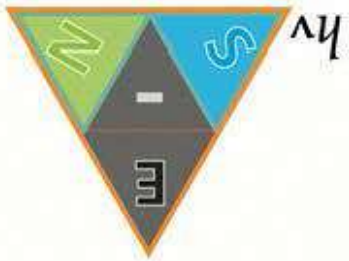
ε_0 The charge geometry of all EM fields determines their Electric Permittivity and Magnetic Permeability μ_0

Photons
are the neutral quanta of EM waves
they are comprised of two opposite charge EM field quanta

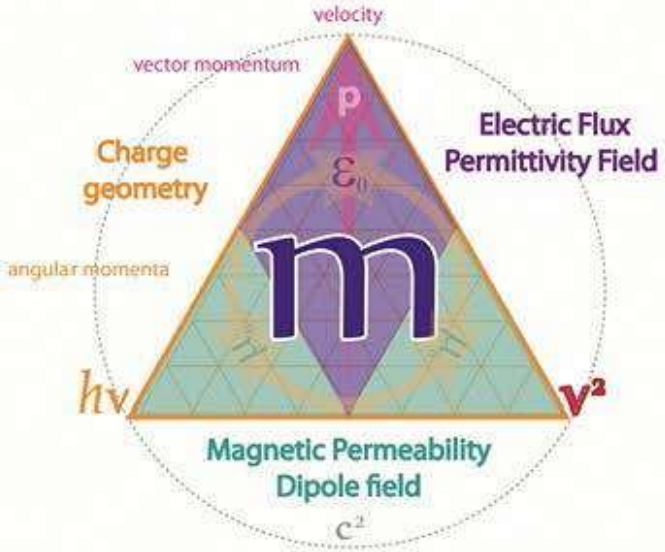
Positive Charge ZPF

Magnetic Monopoles do NOT exist

Negative Charge ZPF



The 'zero point' field has scalar EM energies



Electro-Magnetic fields are the source of all physical Forces

Zero Point fields are polarised and are the sources of

Electro-static and **Magneto-static** fields and particles

The EM field is a equilateral waveform with the Magnetic field always orthogonal to the Electric

The Magnetic fields propogate bi-directionally and the Electric field is responsible for producing linear momentum

The Electric field and Magnetic fields are equal to each other and directly proportional to the velocity of propagation

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The Weak Force

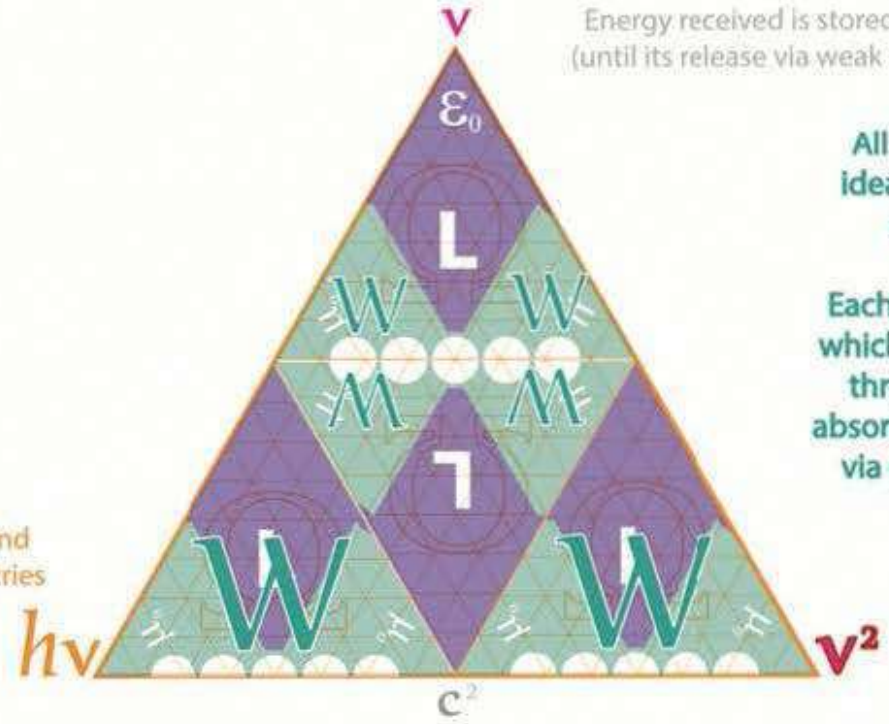
6 Inductive 'Weak' edges
(3 internalised)
(3 externalised)

Quantum Energy is stored or released, and distributed throughout Tetryonic geometries in ODD number quanta [Bosons]

Quantum Inductive loops

Quantum Tank circuit

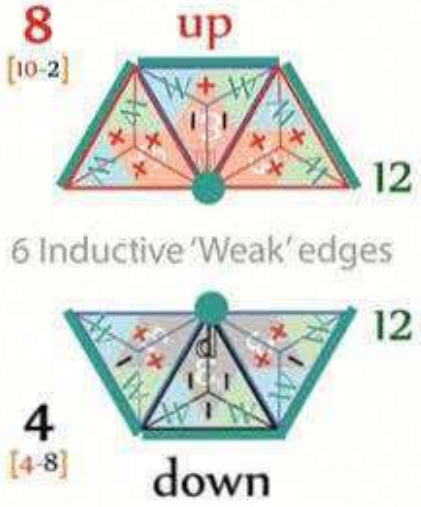
Energy received is stored in quantum inductive loops (until its release via weak interaction - Boson exchange)

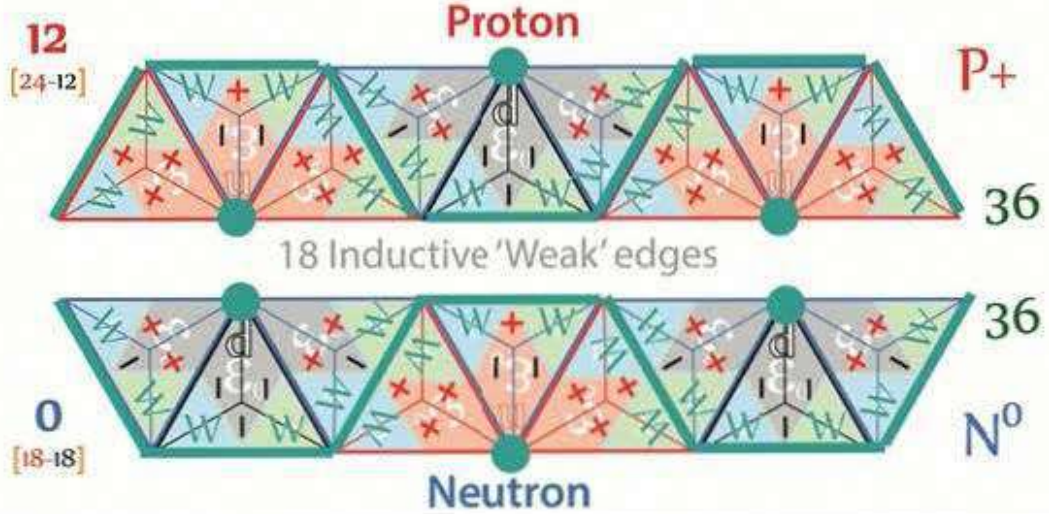


All ElectroMagnetic fields are ideal quantum inductive loops of EM energy momenta

Each has a Magnetic edge (base) which acts as a quantum inductor through which energy can be absorbed or released in EM quanta via electro Magnetic** induction [exchange Bosons]**

Leptons and Quarks
have the same Tetryonic numbers
but differing Matter topologies





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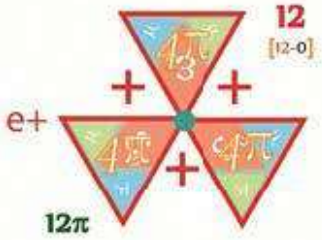
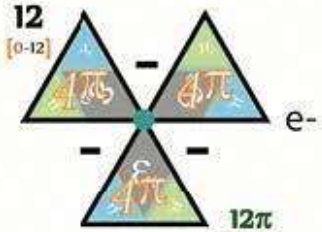
The Strong Force

The force resulting from the interaction of 2 Tetryons along their parallel planar (Electric charge) surfaces



Leptons
Repulsive colour Force

Leptons are 'held together' by a radial Weak Force axis

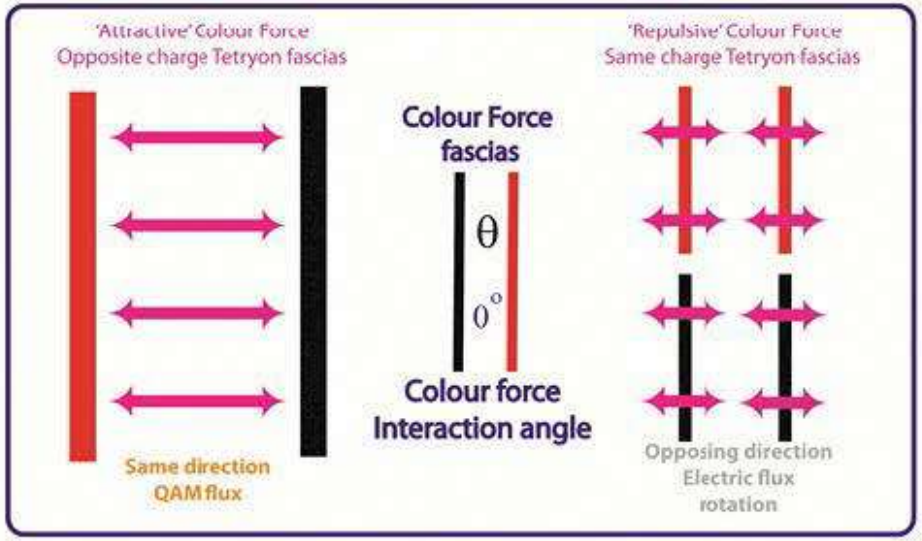


Leptons and Quarks result from the Strong 'colour' force interactions in dodeca-deltahedrons

(In Quarks the attractive strong force produces Octahedral topologies)
(In Leptons the repulsive strong force produces Dodecahedral topologies)

Quarks
4 Fascia 'Colour' Attraction

Quarks
Attractive colour Force



Strong Force strength is directly proportional to the nett mass-energy quanta involved
(Increases/decreases as total Tetryon mass-energy quanta increases/decreases)

Proton

Baryons
Attractive colour Forces

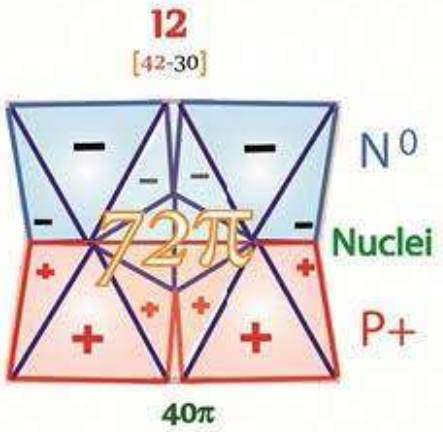
Baryon formation
16 Fascia 'Colour' Attraction

Neutron

The Strong Colour Force is the binding force that holds Nuclei together

Tetryonic Fascia (Planar Electric Charge) interaction

It interacts through oppositely charged Tetryon Fascias in contact with each other in all Matter (save Leptons)



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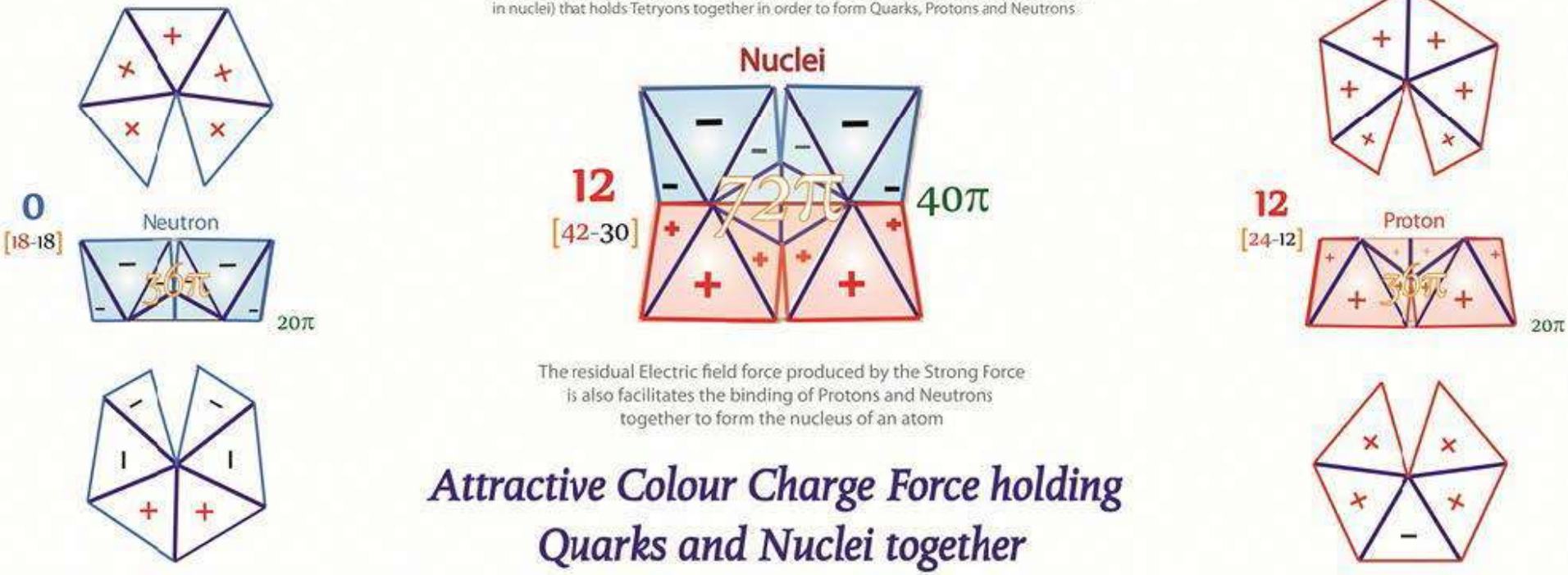
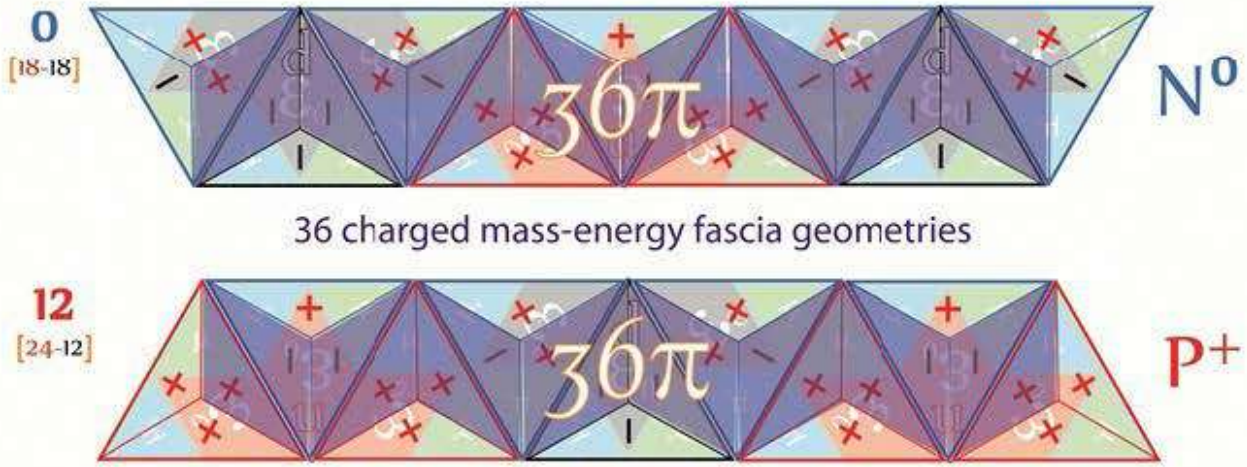
Strong Force Interaction

On the smallest scale (less than about 0.8 fm), it is the Electric force (mediated by gluons in nuclei) that holds Tetryons together in order to form Quarks, Protons and Neutrons



The residual Electric field force produced by the Strong Force is also facilitates the binding of Protons and Neutrons together to form the nucleus of an atom

Attractive Colour Charge Force holding Quarks and Nuclei together



36 charged mass-energy fascia geometries

creates an external Baryons topology with 20 charge fascia

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Proton
Hydrogen ion
36

1 Proton	24-12
Total Charge	24-12 [+12]

H^+
F+ n=25

12
[24-12]
0.99946
P+
22,500

Proton - Hydrogen ion

The Proton is a Baryon with a Positive Tetryonic charge geometry of +12 [24-12] (and a final Matter topology of 20π]

It attracts electrons [0-12] and Neutrons [13-18] through their opposite charged facia in order to reach charge equilibrium

The Proton's opposite charge particle is the electron
If it binds with one or more Neutrons it will still attract electrons in order to acheive Tetryonic charge equilibrium.

As a Hydrogen nuclei it is highly reactive

Neutral
Hydrogen
48

1 Proton	24-12
1 electron	0-12
Total Charge	24-24 [0]

H^0
F+ n=25
e- n=1

0
[24-24]
1.00000
e-
P+
22,512

Neutral Hydrogen

Hydrogen is the Second Neutral Tetryonic geometry (Baryon) formed in the creation of Matter

It is a [24-24] NEUTRAL [balanced] Tetryonic charge geometry

The Neutral Hydrogen Atom interacts with Deuterium and other Elements via its external nucleon fascia charges (residual EM Interactions)

Deuterium
84

1 Proton	24-12
1 Neutron	18-18
1 electron	0-12
Total Charge	42-42 [0]

D^1
N° n=25
F+ n=25
e- n=1

0
[42-42]
1.99946
N°
e-
P+
45,012

Deuterium

Deuterium has the same nett charge as Neutral Hydrogen but has an increased Tetryonic mass- Matter topology

It has an additional 9 Tetryons in its nucleus (due to the Neutron) and consequently is larger than the Hydrogen nucleus

It has a [42-42] NEUTRAL Tetryonic charge geometry
Deuterium nuclei combine to form all other elements

Tritium
84

1 Proton	24-12
1 Neutron	18-18
1 electron	0-12
Total Charge	42-42 [0]

D^7
N° n=31
F+ n=31
e- n=7
Radioactive Isotope

0
[42-42]
3.09968
N°
n7
e-
P+
69,780

Tritium
(Radioactive Deuterium)

Tritium has the same nett Tetryonic charge as Neutral Hydrogen and Deuterium (D) but due to its higher quantum energy levels it has additional mass-energy quanta in its charged geometry

It has the same 84 charged fascia in its nucleus as Deuterium but its increased mass-energy is equivalent to that of 1 Neutron.

This extra nuclear energy is the source of its radioactivity and ongoing confusion in chemistry where it is released as a variety of decay particles over time

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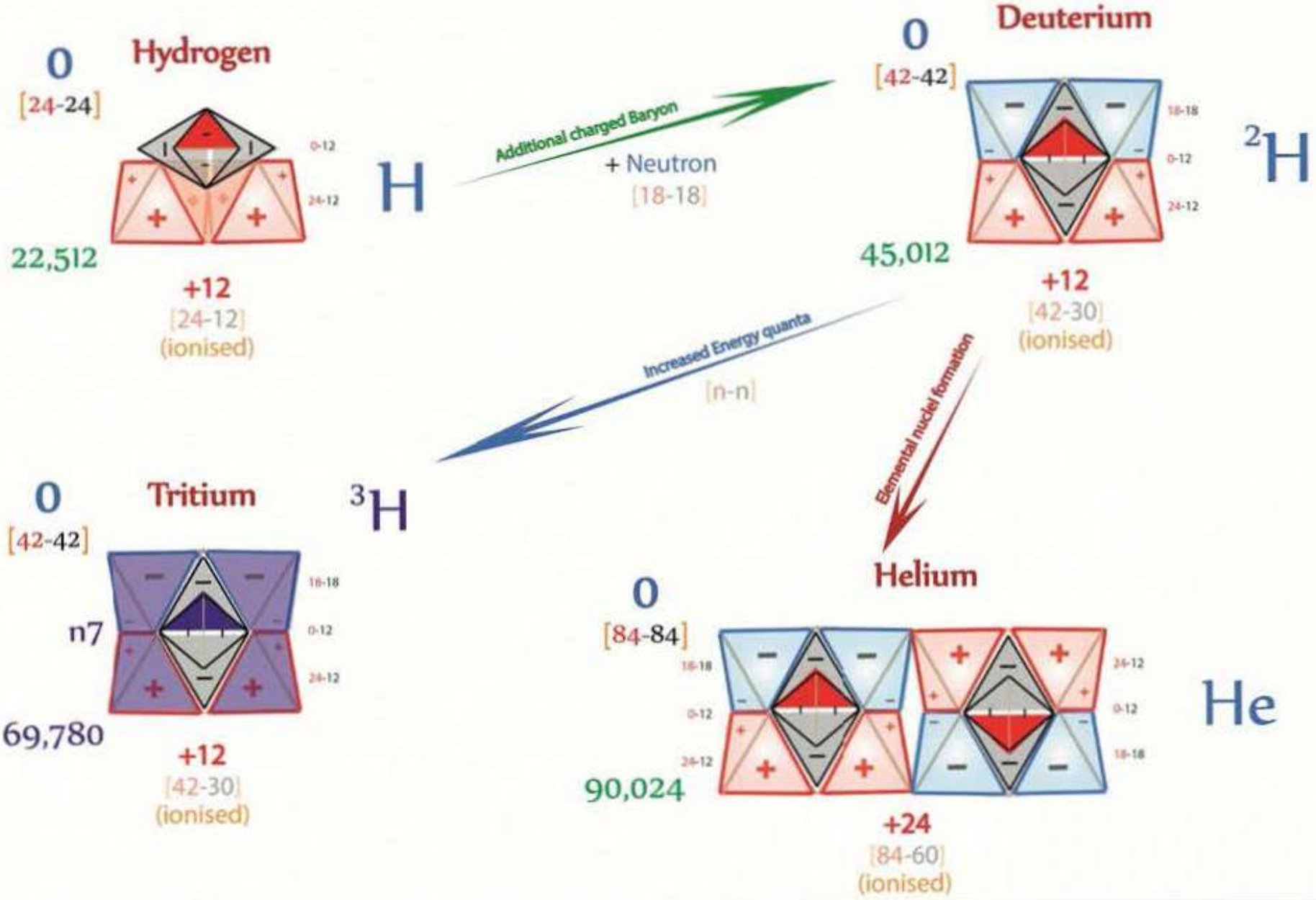
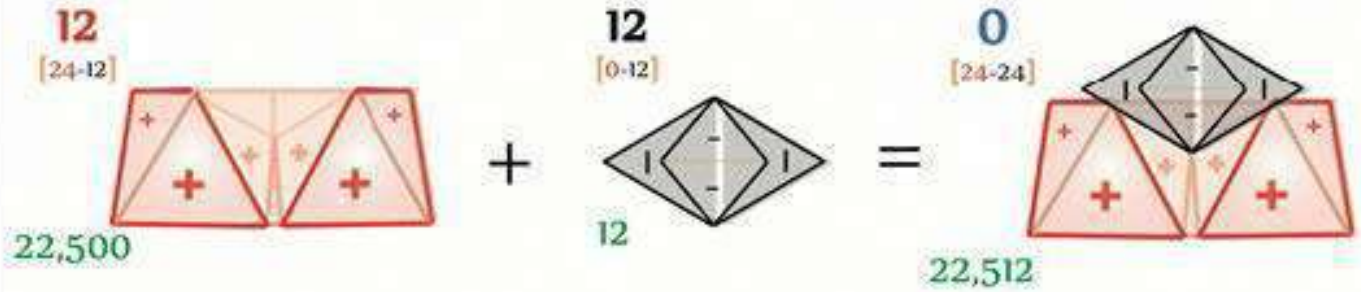
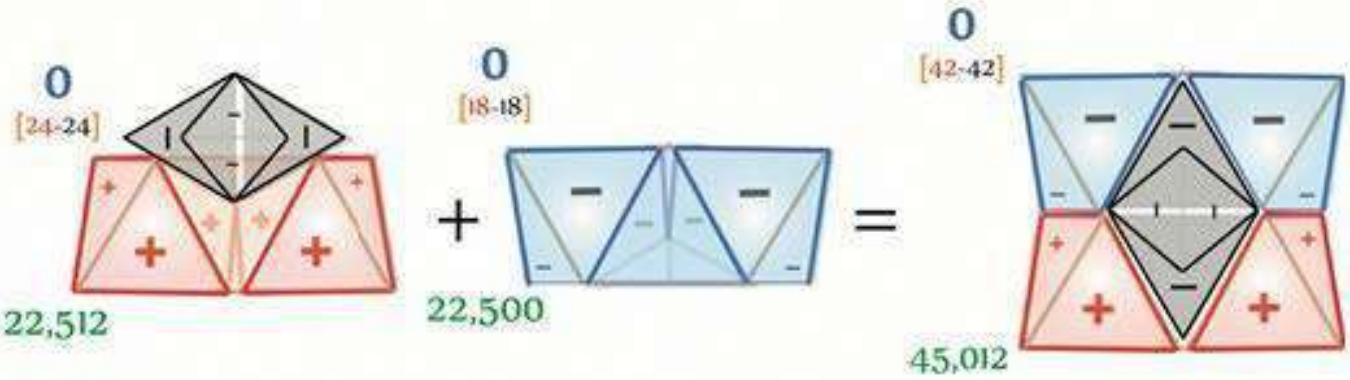
Hydrogen - Helium genesis



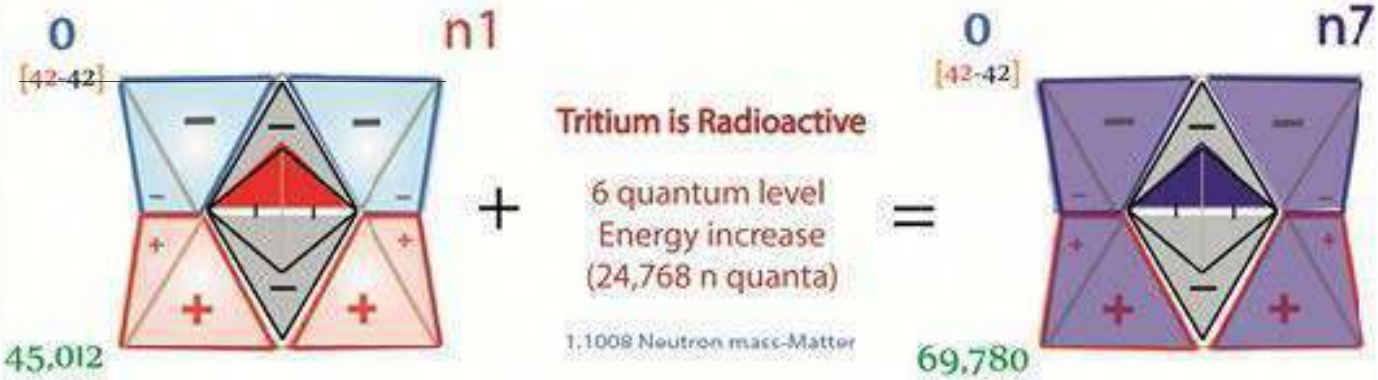
Hydrogen Family



Proton	electron	Hydrogen
36π	12π	48π



Hydrogen	Neutron	Deuterium
48π	36π	84π



Deuterium	Tritium
84π	84π

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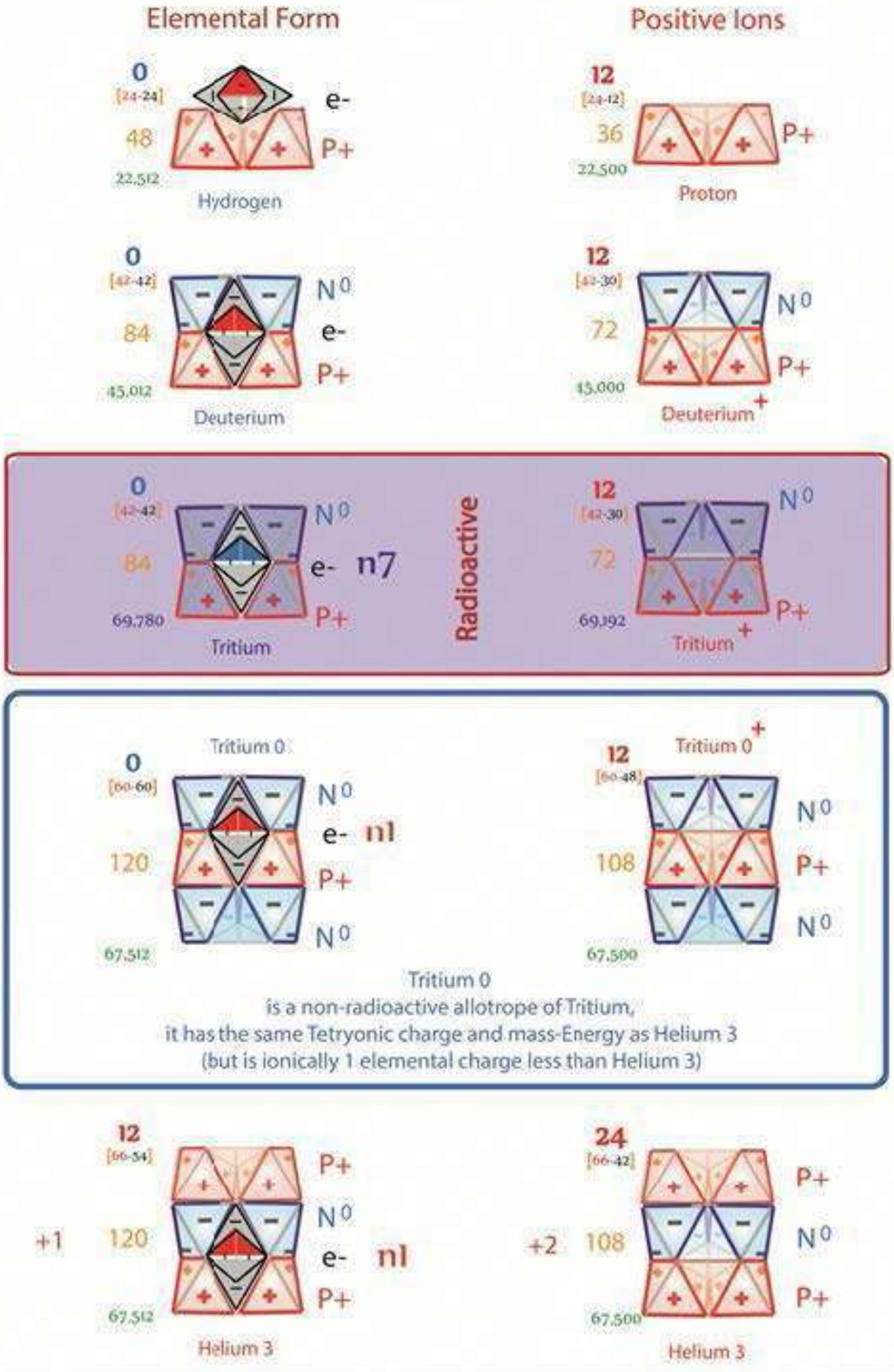
Hydrogen-Helium3 genesis



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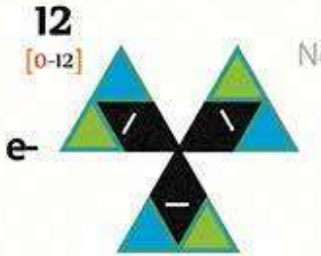
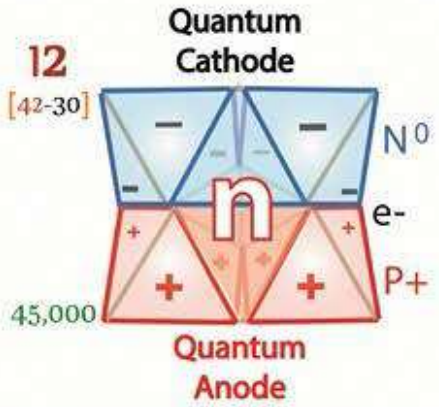
Quantum Batteries

Atomic nuclei can be easily scaled to non-quantum sizes to offer clean, safe and portable long term energy storage devices that can store energy indefinitely and release it on demand anywhere in the World



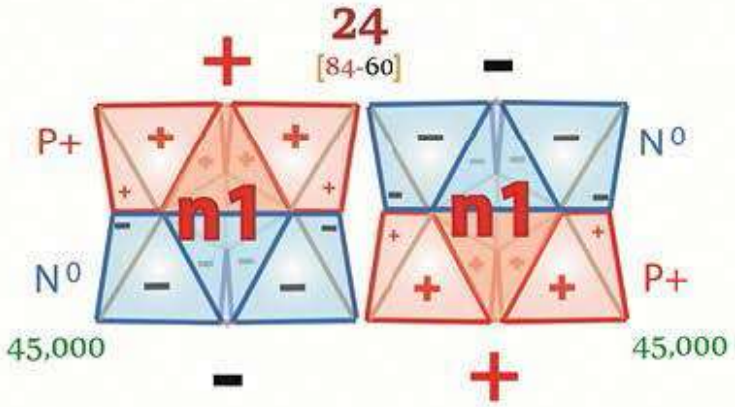
12 loop quantum inductive rotor

The quantum battery is unique in that in addition to storing energy indefinitely, when the nuclei combine with a lepton it has the ability to release specific energies [photons] by way of its synchronous quantum convertor topology



Energy stored in quantum batteries is measured as mass

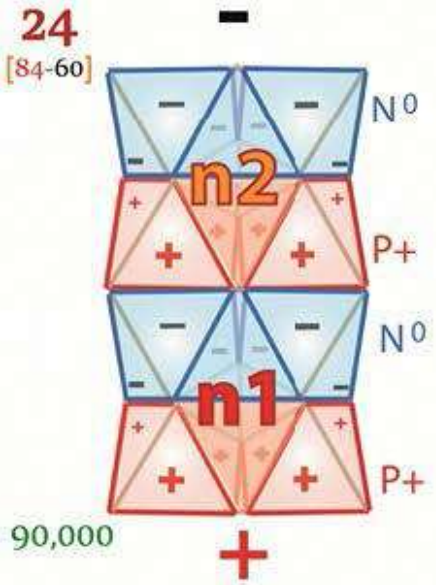
(Atomic Nuclei)



anti-Parallel Configuration

The non-neutral charge of atomic nuclei attract free leptons into 'bound' states within the various **n** levels of atomic shells releasing energy as spectral photons

Series Configuration



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Quantum synchronous Converters

With the addition of a quantum rotor (lepton) a quantum battery can be converted from a storage device into a energy distribution device.

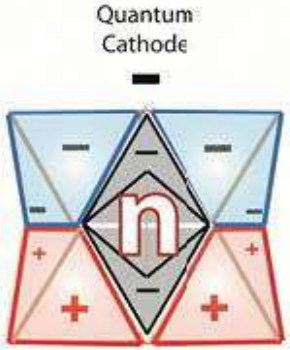
And just like the quantum battery, the quantum convertor can be scaled to any size in order to provide tailor-made energy efficient delivery devices

The electron can be viewed as a rotating inductor consisting of 3 negative Tetryons

$$12\pi \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]_{n1}^{n8}$$

Leptons — EM Field: ElectroMagnetic; Planck quanta: mass, velocity

The electron has a charged Matter topology that is electrically equivalent to a quantum 6 loop inductive rotor



$$72\pi \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]_{n25}^{n32}$$

Nuclei — EM Field: ElectroMagnetic; Planck quanta: mass, velocity

$$84\pi \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]_{n25}^{n32}$$

Deuterons — EM Field: ElectroMagnetic; Planck quanta: mass, velocity

Where varying levels and frequencies of Energy are transmitted long distances and need to be stored for later release on demand the 'ideal' mechanical device is the rotating (or synchronous) convertor

Changes in energy-momenta results in photon emission/absorpt on lines photon emission/absorption produces changes in leptronic energy-QAM and resul:s in the quantum transition of electrons in atomic orbitals

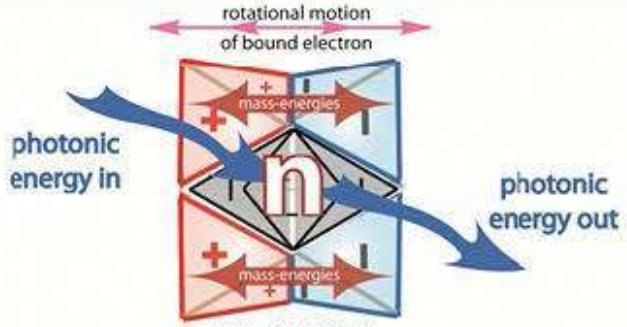
Changes in Baryonic energy levels induces a directly proportional change in electron energy levels

3 forms of mass-energy momenta are possessed by quantum convertors

Angular Momentum (motional energy)
linear momentum of Baryons & leptons

Photonic spectral energies (emission/absorption)
KEM fields geometries of photo-electrons

Nuclear mass-energies (stored energy quanta)
standing wave mass-energies of Matter topologies



QAM of KEM field creates angular momentum

A change in any 1 of the 3 types of energy in a atom results in a proportional change in the other 2

External EM fields and incident photons can all affect the quantum energy levels of the atomic nuclei

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Hydrogen Ionisation Energies

$Mv^2 = KEM = hv^2$

n8	En = -0.21 eV	768	
n7	En = -0.27 eV	588	
n6	En = -0.37 eV	432	
n5	En = -0.54 eV	300	
n4	En = -0.84 eV	192	
n3	En = -1.50 eV	108	
n2	En = -3.4 eV	48	
n1	En = -13.6 eV	12	

0

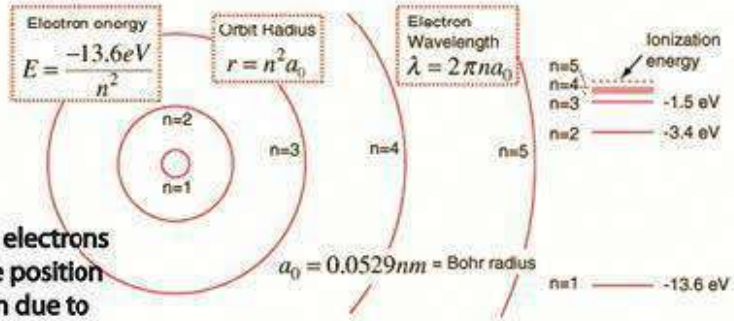
[24-24]

22,512

Hydrogen

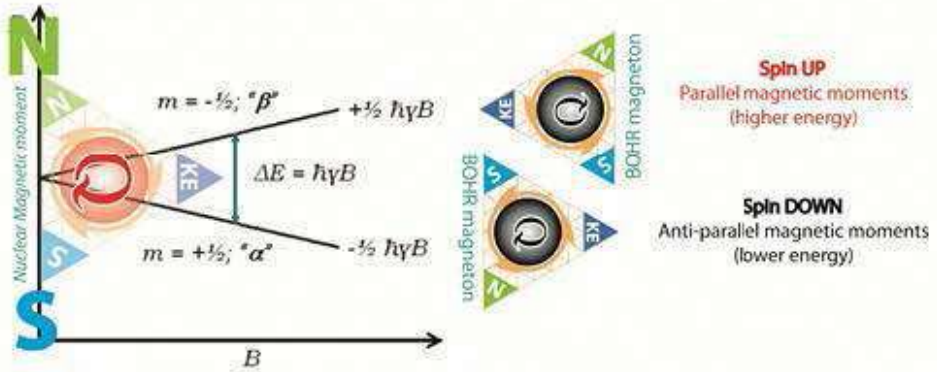
The KEM Planck quanta required to ionise a photo-electron

The ionisation energy level for each quantum level is proportional to the square of the quantum number



In Hydrogen nuclei electrons remain in the same position close to the Proton due to Coulombic attraction.

The established model of electron orbitals having circular radii of increasing size in proportion to their energies is incorrect



The intrinsic magnetic moment of the rotating electron couples wrt the nuclear magnetic moment to produce a split in the resulting spectral lines produced by quantum level transitions

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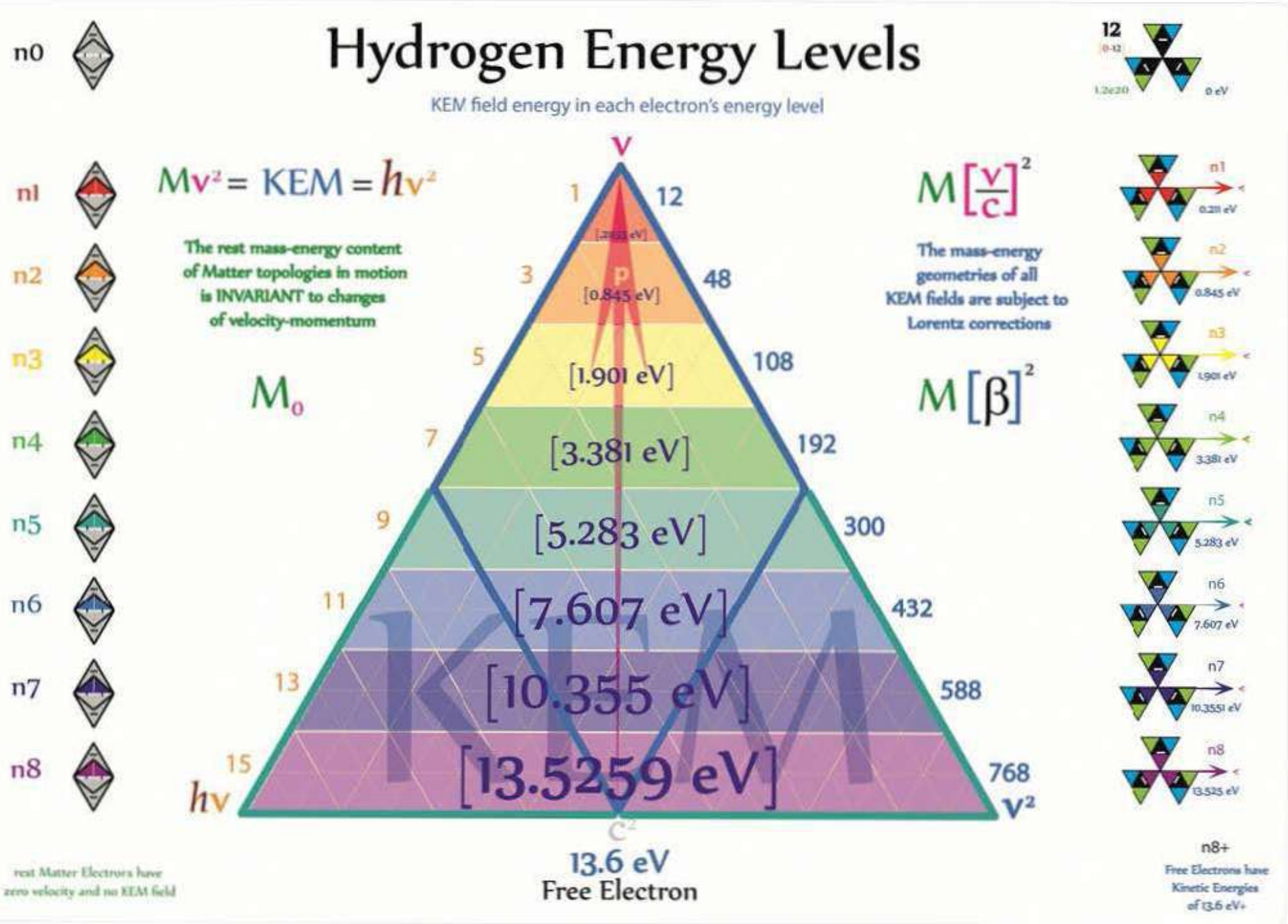

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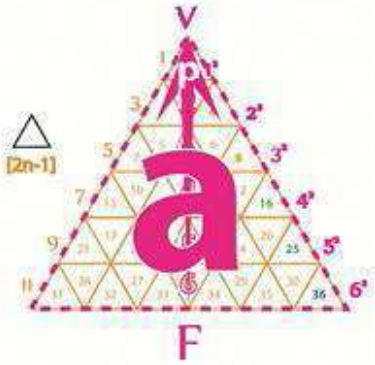
Kinematics

An inertial frame of reference is one in which the motion of a particle not subject to forces and results in motion in a straight line at constant velocity

Deceleration

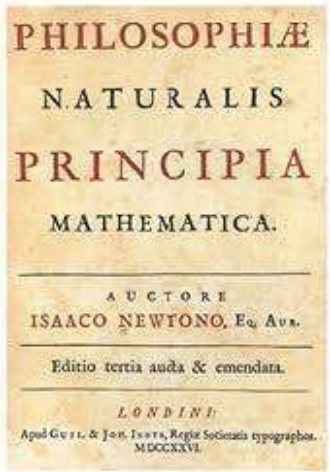
[Inertial Frame MINUS odd quanta]

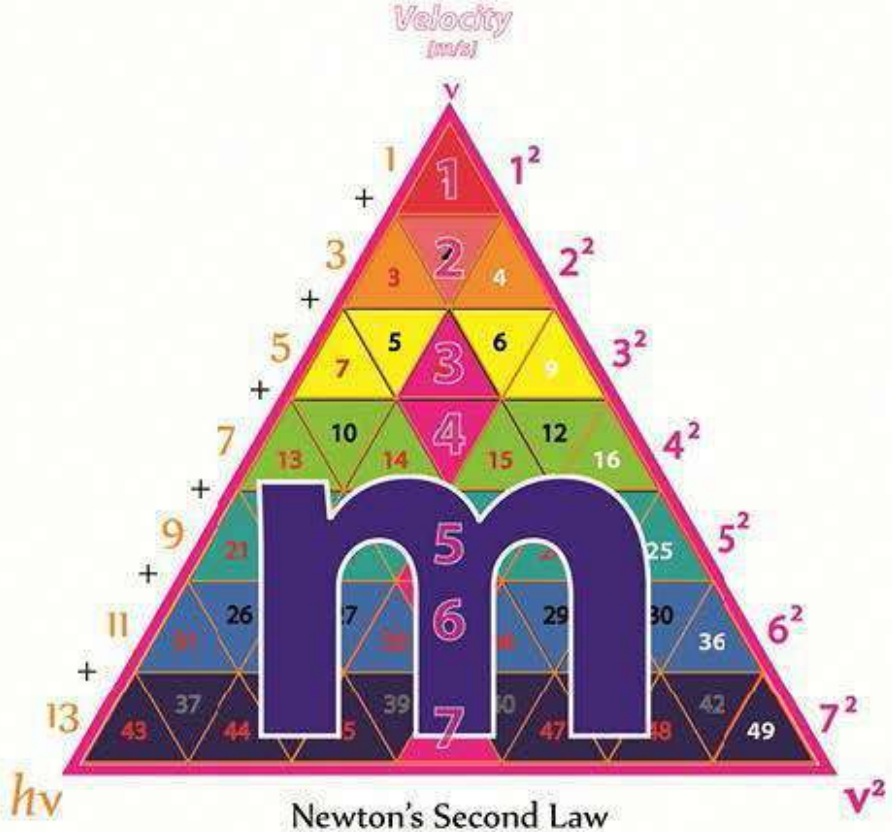


Newton's First Law

$$\sum \mathbf{F} = 0 \Rightarrow \frac{d\mathbf{v}}{dt} = 0$$

Every body persists in its state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by force impressed





Newton's Second Law

$$\sum \mathbf{F} = \frac{\mathrm{d}\mathbf{p}}{\mathrm{d}t} = m\frac{\mathrm{d}\mathbf{v}_{cm}}{\mathrm{d}t} = m\mathbf{a}_{cm}$$

Force creates a change in Momentum over Time

A body of [m]ass subject to a net [F]orce undergoes an [a]cceleration that has the same direction as the force and a magnitude that is directly proportional to the force and inversely proportional to the mass, i.e., F = ma.

Alternatively, the total force applied on a body is equal to the time derivative of linear momentum of the body.

Sir Issac Newton

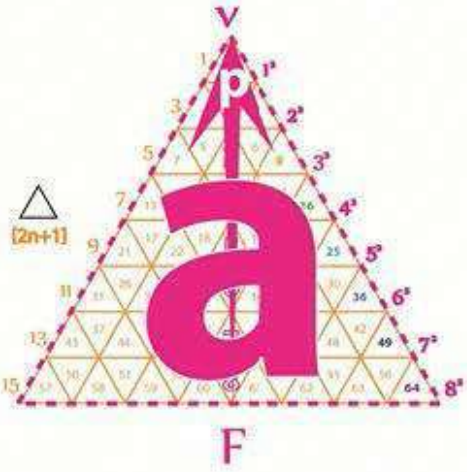
(25 December 1642 – 20 March 1727)

$$a = \frac{\Delta y}{\Delta x} = \frac{\Delta v}{\Delta t}.$$

$$\mathbf{F} = m\mathbf{a} \quad \rightarrow \quad \mathbf{a} = \mathbf{F}/m$$

Acceleration

[Inertial Frame PLUS odd quanta]



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Inertia and Force

momentum

The classical definition of Momentum relates the mass of a material body at given velocity (v) to its Momentum (p); it is a proportionality factor in the formula

$$p = mv$$

Any change to the energy-momenta content of a closed inductive loop requires a proportional change to the loop's energy density

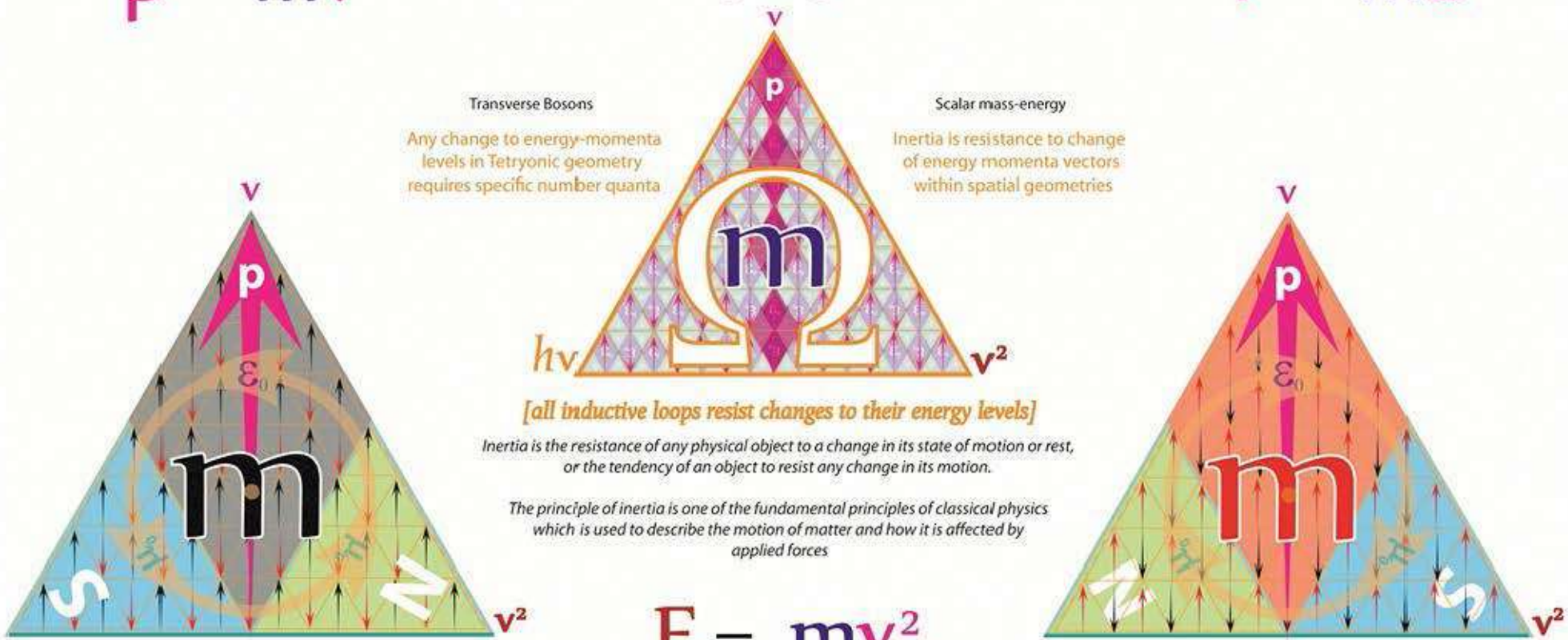
linear quanta forces

divergent ↑ [v - v] ↓ convergent

Force

This meaning of a body's inertia therefore is altered from the classsical definition of "a tendency to maintain momentum" to a description of the measure of how difficult it is to change the momentum of a body

$$F = ma$$



[all inductive loops resist changes to their energy levels]

Inertia is the resistance of any physical object to a change in its state of motion or rest, or the tendency of an object to resist any change in its motion.

The principle of inertia is one of the fundamental principles of classical physics which is used to describe the motion of matter and how it is affected by applied forces

$$E = mv^2$$

Any change in the energy-momenta content of a body of mass-Matter results in a proportional change in its momentum-velocity

Linear momentum is the nett square root of mass-energy quanta

p

Force is the sum of the linear mass-energy momenta quanta

F

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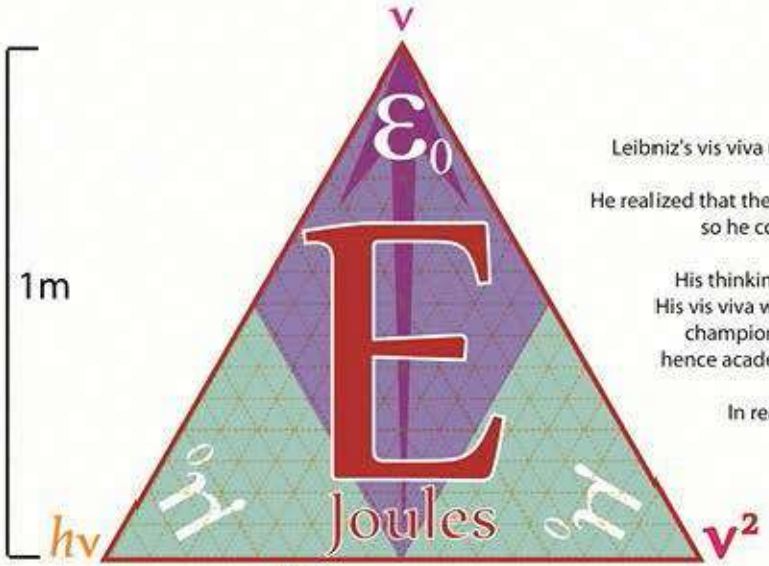
Gottfried Wilhelm von Leibniz

(July 1, 1646 – November 14, 1716)



Scalar Energy

Leibniz's vis viva (Latin for living force) is mv^2, twice the modern kinetic energy.

He realized that the total energy would be conserved in certain mechanical systems, so he considered it an innate motive characteristic of Matter.

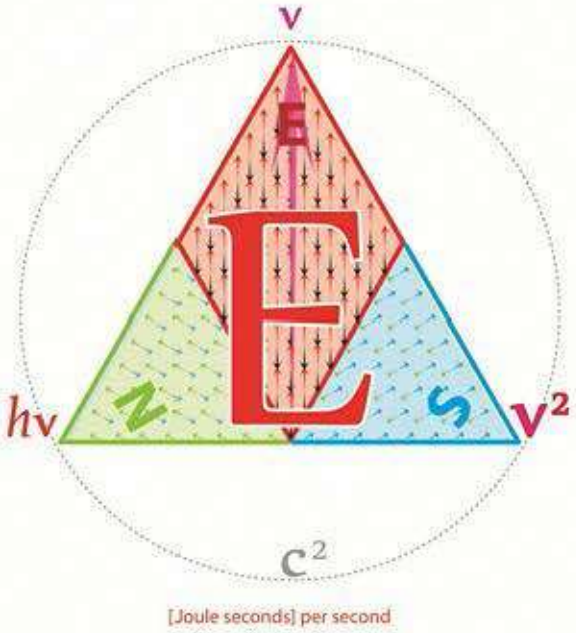
His thinking gave rise to another regrettable nationalistic dispute. His vis viva was seen as rivaling the conservation of linear momentum championed by Newton in England and by Descartes in France; hence academics in those countries tended to neglect Leibniz's idea.

In reality, both energy and momentum are conserved, so the two approaches are equally valid.

Newtons

of force

The nett direction of Force within energy geometry is UNIDIRECTIONAL
ie the force exerted is the result of the nett linear momenta irrespective of charge



[Joule seconds] per second

mass x velocity squared $kg.\left[\frac{m}{s}\right]^2$

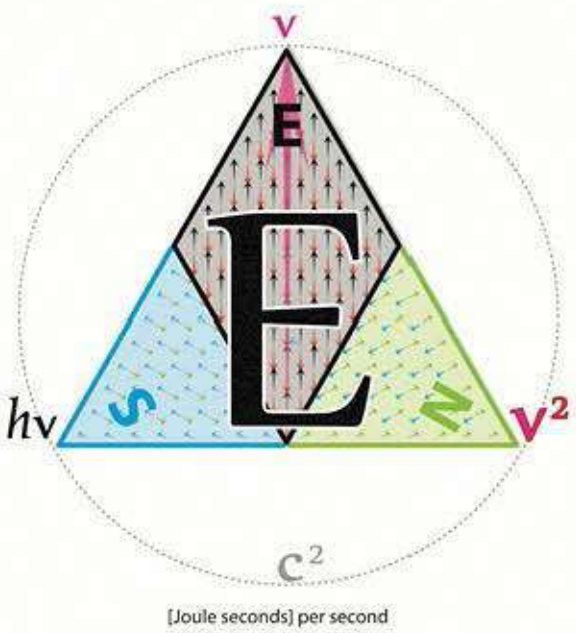
Energy $kg.\frac{m^2}{s^2}$

$$J = \frac{kg \cdot m^2}{s^2} = N \cdot m = Pa \cdot m^3 = W \cdot s$$

A Joule is equal to the energy expended (or work done) in applying a force of one newton through a distance of one metre (1 newton metre or N-m)

momentum x velocity $\left[kg.\frac{m}{s}\right].\frac{m}{s}$

Planck's quanta per second $\left[kg.\frac{m^2}{s}\right].s^{-1}$



[Joule seconds] per second

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Linear Momentum

Linear momentum is the SQUARE ROOT of equilateral Planck mass-energy geometries and produces a undirectional vector force

The Energy-momentum relationship is a fundamental physical property used to determine the mass of a body

Using the formula for mass-Energy equivalence as it relates to Photons moving at 'c'

$$E = h\nu = \frac{hc}{\lambda} = mc^2$$

Noting that the rest mass in the case of EM fields (Eosons and Photons) is to equal Zero

we can derive a relationship for Momentum - Energy - Wavelength showing that

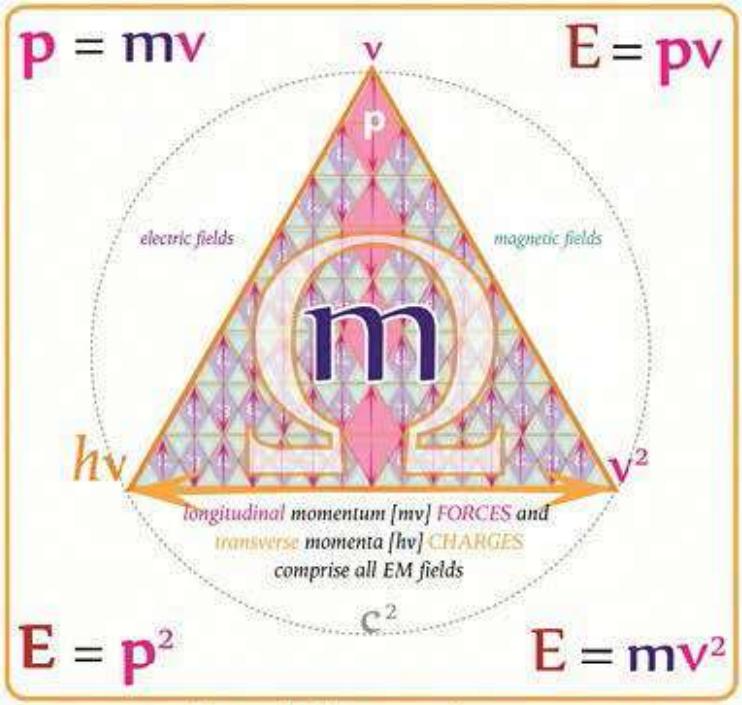
$$p = E/c$$

Thus momentum in Photons is directly related to the EM energy content of the photon and the mass-energy content of any massive 3D body

$$p = \hbar k = \frac{h\nu}{c} = \frac{h}{\lambda}.$$

and momentum in Particles is related to the total EM Energies of an object (its rest Matter + KE) and the wavelengths associated with those distinct energy levels

$$p = \frac{E}{c} = \frac{h\nu}{c} = \frac{h}{\lambda}$$



Longitudinal [linear] momentum

Energy

$$p = n\pi\left[\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v}\right]\right]$$

Planck quanta

momentum

Momentum is a conserved quantity, meaning that the total momentum of any closed system (one not affected by external forces) cannot change.

Linear Momentum is the intrinsic sqare root vector component of Force

$$p = mv$$

In classical mechanics, momentum is the product of the mass and velocity of an object.

$$\sum \mathbf{F} = \frac{d\mathbf{p}}{dt} = m\frac{d\mathbf{v}}{dt} + \mathbf{v}\frac{dm}{dt}$$

In relativistic mechanics, this quantity is multiplied by the Lorentz factor.

$$p = n\pi\frac{\left[\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v^2}\right]\right]}{v} = mv$$

Planck quanta

EM field momentum is a function of its energy density, and is directly proportional to the group velocity

$$\left[\sqrt{\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v}\right]^2}\right]$$

Planck quanta

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Vector linear momentum

is the square root of the KEM field energies produced by Matter in motion

Energy

$$n\pi\,[[m\Omega v]]$$

momenta

Classical formulation

$$p = mv$$

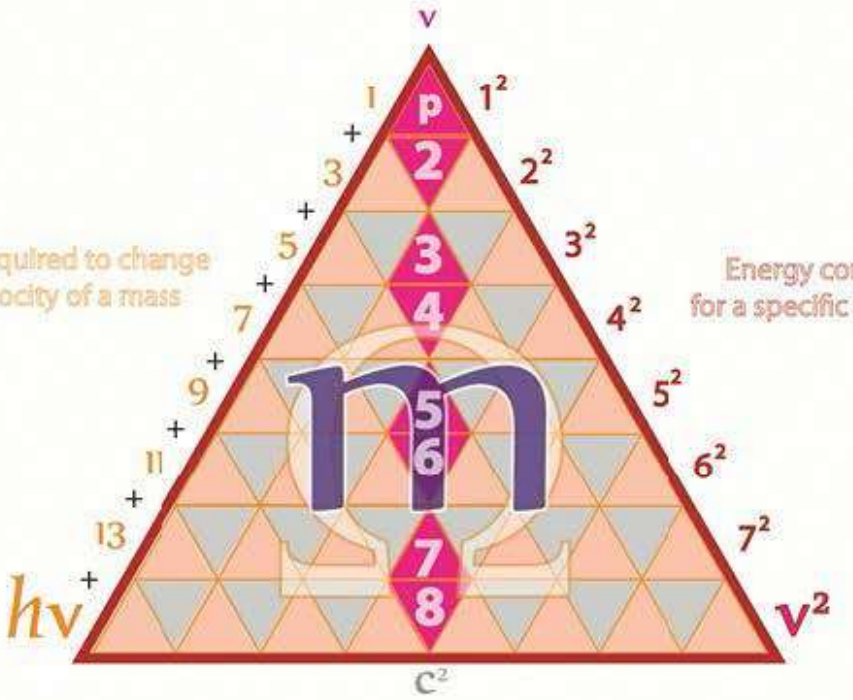
Linear Momentum
is the vector force of
mass times its velocity

Quantum formulation

$$p = \frac{E}{v}$$

Linear Momentum is
Energy dividec by the
square root of its quanta

INERTIAL FRAME
[m/s]



Energy required to change
the velocity of a mass

Energy content
for a specific velocity

$$\mathbf{p} = \sum_{i=1}^{n} m_i \mathbf{v}_i = m_1\mathbf{v}_1 + m_2\mathbf{v}_2 + m_3\mathbf{v}_3 + \cdots + m_n\mathbf{v}_n\,,$$

The linear momentum of a EM field or system of particles is
the vector sum of the linear momenta in the KEM fields
of individual particles in any spatial co-ordinate system

$$\frac{E}{c^2}.v$$

$$\frac{hv^2}{v}$$

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Kinetic Energy

is the Electric field energy of Matter in motion

$$1/2\left[4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]\right]$$

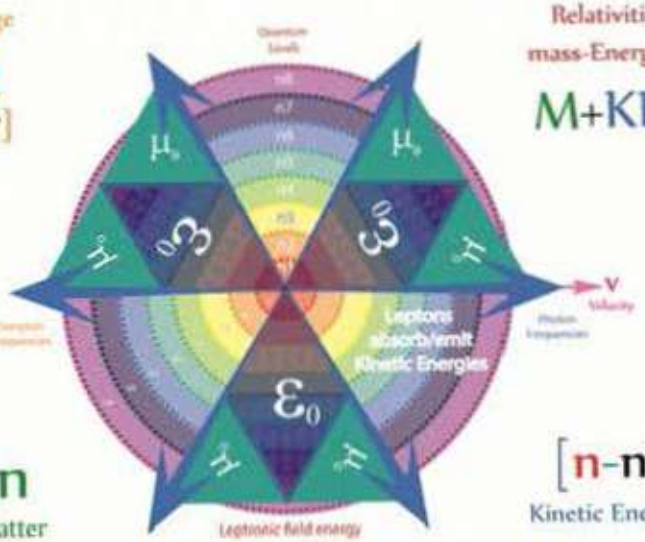
Matter · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Kinetic Energy is the diamond electric field extending from charged Matter topologies as a result of its motion, it follows Tetryonic omega geometry and is proportional to an object's mass-Matter and its vector velocity

Charge

$$Q$$

$[v\text{-}v]$



Relativitic mass-Energies

$$M+KE$$

$12n$

rest Matter

$[n\text{-}n]$

Kinetic Energies

Kinetic Energy is 1/2 of the secondary KEM field energies created when Matter particles are in motion

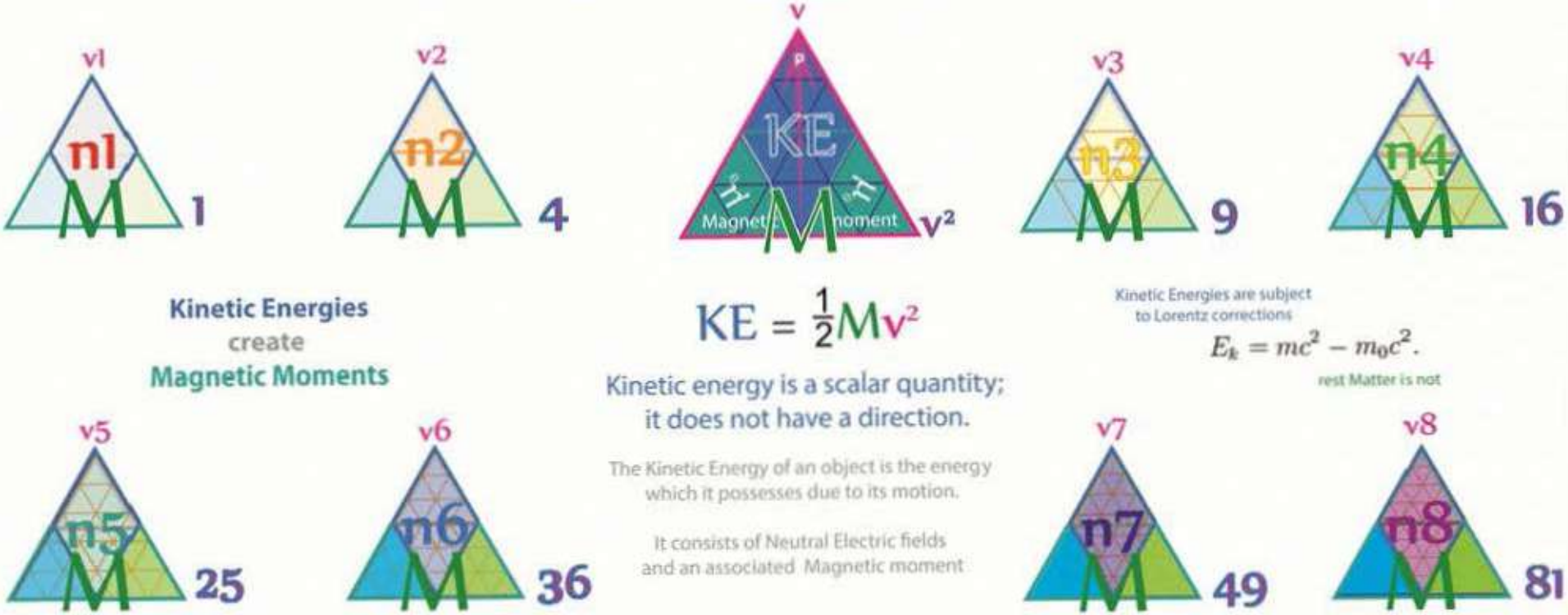
$$2\pi\left[\left[m\Omega v^2\right]\right]$$

Planck quanta · mass · velocity

$$c^2$$

EM Field

and is shown to be subject to Lorentz corrections



Kinetic Energies create Magnetic Moments

$$KE = \frac{1}{2}Mv^2$$

Kinetic energy is a scalar quantity; it does not have a direction.

The Kinetic Energy of an object is the energy which it possesses due to its motion.

It consists of Neutral Electric fields and an associated Magnetic moment

Kinetic Energies are subject to Lorentz corrections

$$E_k = mc^2 - m_0c^2.$$

rest Matter is not

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Kinetic Energy and Magnetic moments

$$Mv^2 = KEM = p^2$$

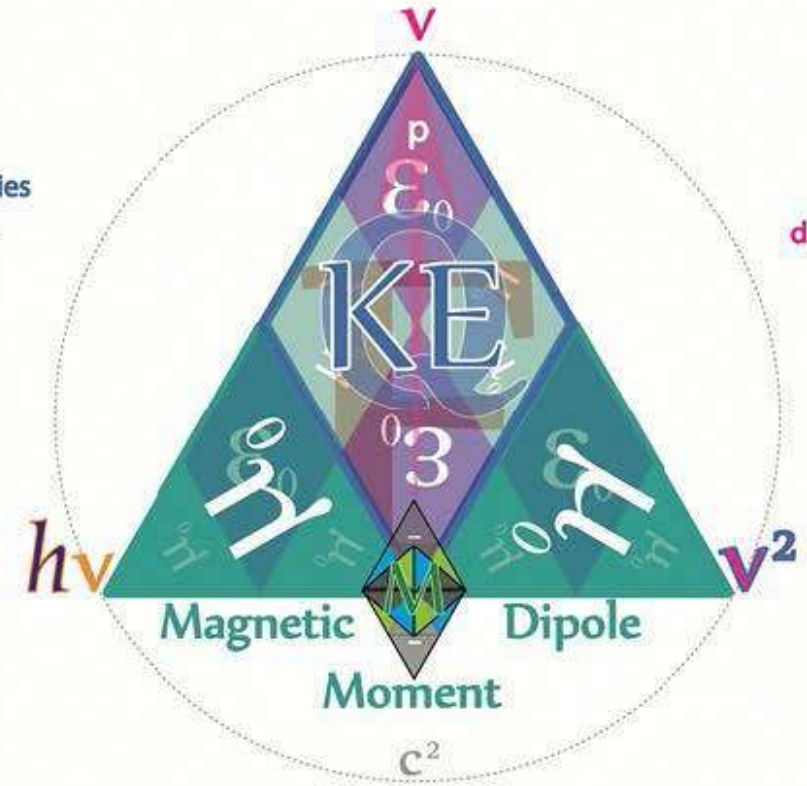
Unlike charged fields KEM fields have neutralised Electric Fields

$$KE = \frac{1}{2}Mv^2$$

KEM field geometry of positive charged Matter in motion

KEM field geometry of negative charged Matter in motion

Often noted as being two distinct EM energies [Kinetic Energy and Magnetic moments] are shown to be orthogonal aspects of the same KEM field of motion



As the velocity of a particle increases so does its Kinetic Energy and Magnetic moment creating Lorentz variable KEM fields

$$\mu_B = \frac{1}{2}Mv^2$$

$$\mu_B = \frac{1}{2}Mv^2$$

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Types of Momentum

There are 3 forms of momenta in physics

equilateral charge geometry

$$h$$

[kg·m²/s]

$$m\Omega$$

Ω

quantised angular momenta

[m²/s]

The quantised 'angular momentum' of each Planck mass-energy geometry, gives rise to the two quantum Charges

p

Linear momentum

[kg·m/s]

The square root (v) of each Planck quanta's mass-energy geometry (v^2) is vector Linear Momentum

vector momentum

$$mv$$

[kg·m/s]

$$\mathbf{p}$$

ℓ

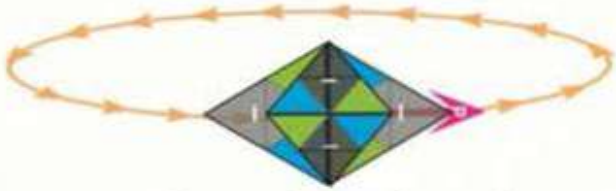
Angular momentum

[kg·m²/s]

The orbital angular momentum of electrons in atoms associated with a given quantum state

... [n-1] [n] [n+1] ...

vector rotation about a point



$$L^2 = L_x^2 + L_y^2 + L_z^2$$

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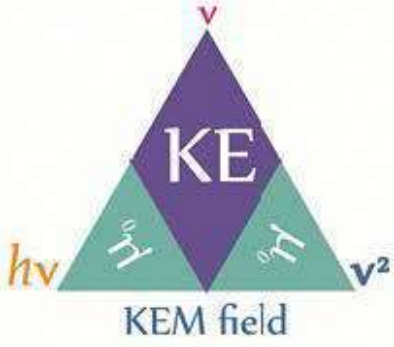
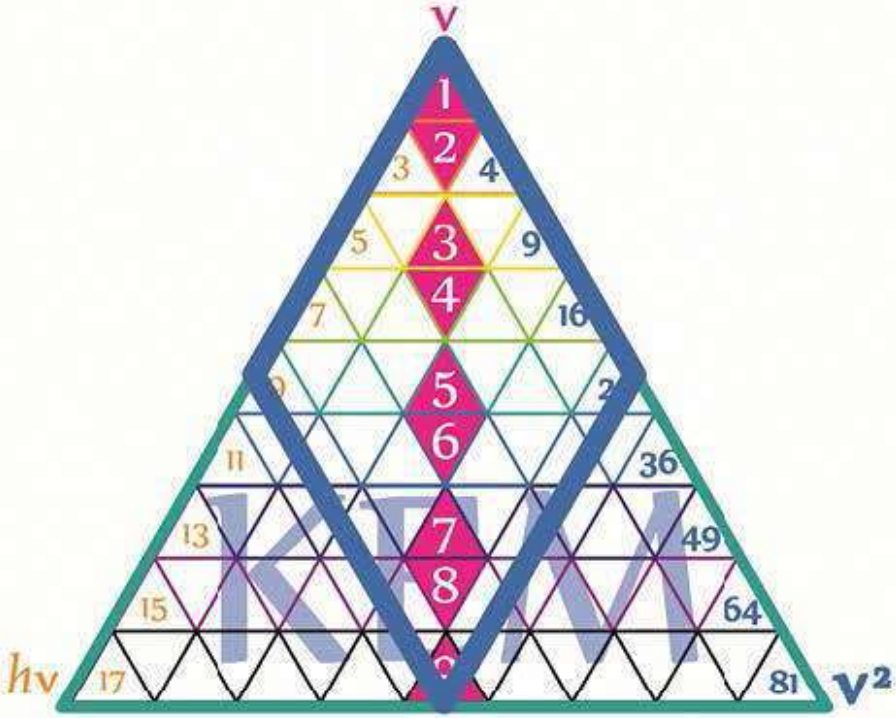
Kinetic Energy vs Momentum

An important difference is that Kinetic energy is a scalar quantity - it has no direction in space
momentum is a vector quantity - it has a direction in space, momenta combine like forces do.

$$p = Mv$$

$$KE = 1/2[Mv^2]$$





$$p = \sqrt{E}$$

$$KEM = Mv^2$$

In Tetryonic geometry, the square root maps the linear momenta [mv] of a field to its ENERGY

$$p^2/_{2m} = KE$$

In Tetryonic geometry, E-field geometry maps the kinetic energy [1/2 mv] of a field to its ENERGY

Linear momentum has a different geometric ENERGY relationship to that of Electric fields

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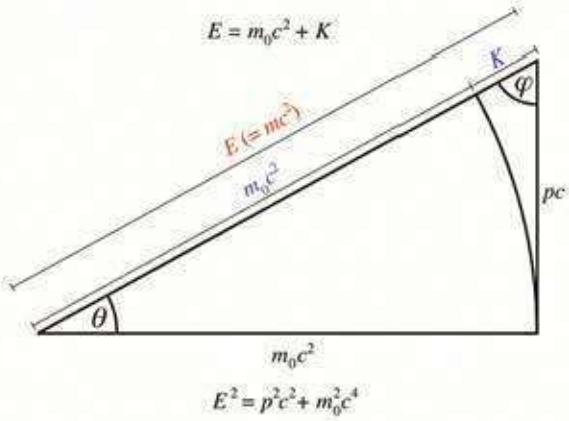
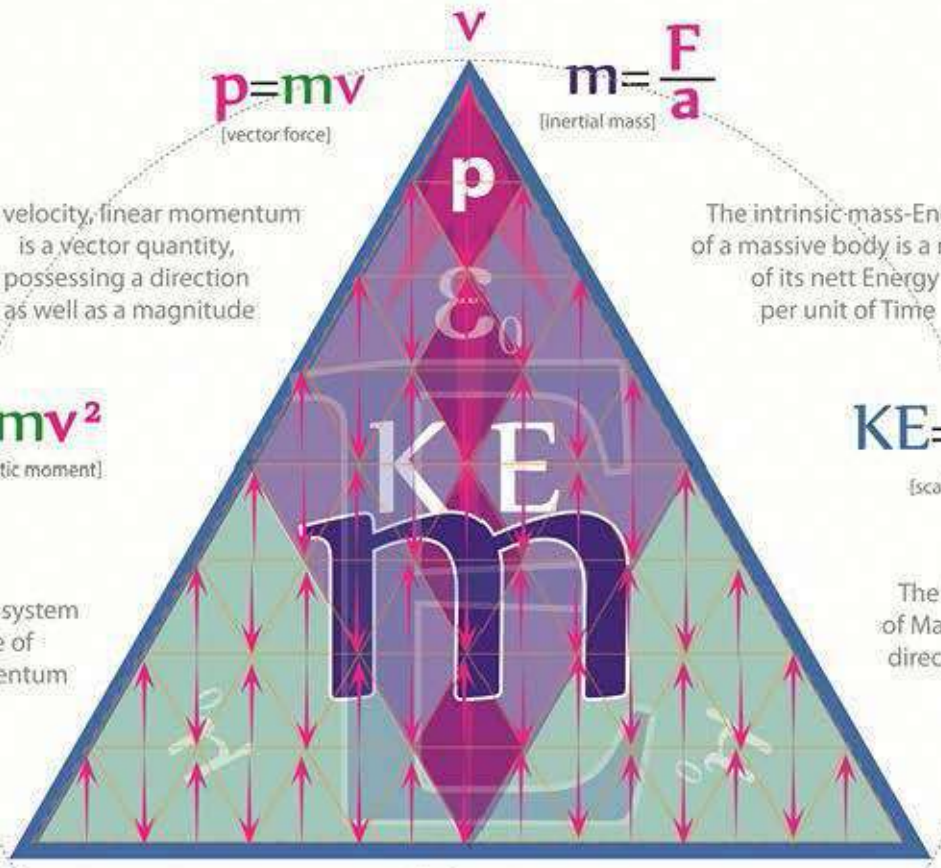
mass-Energy-momentum



Often generalised as having the geometry of right angled triangles the mass-energy momenta relationship is fully revealed using Equilateral geometry



$p=mv$ [vector force]

$m=\frac{F}{a}$ [inertial mass]

Like velocity, linear momentum is a vector quantity, possessing a direction as well as a magnitude

The intrinsic mass-Energy of a massive body is a result of its nett Energy per unit of Time

$KEM=mv^2$ [Kinetic Energy & magnetic moment]

$KE=\frac{1}{2}mv^2$ [scalar E-field]

The Energy of a system is the square of its linear momentum

The Kinetic energy of Matter in motion is directly related to its velocity

E^2 is the energy content of a superpositioned EM field

$E=mv^2$ [scalar KEM field energies of Matter in motion]

$E=p^2$ [Energy momenta]

Planck quanta

$[m\Omega v]$

mass velocity

acceleration results in changes to momenta

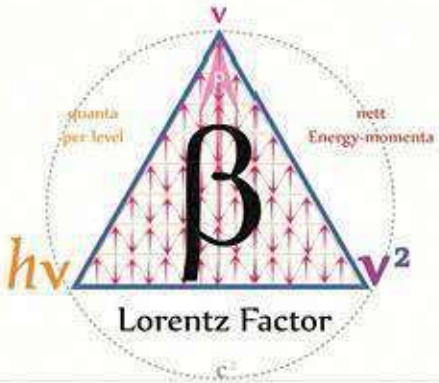
$F=ma$

Newton's Second law of Motion

Linear momentum is the square root of the Energy of a system.

It is the nett linear Force resulting from Matter in motion and was used by Newton as the foundation for his Laws of motion

Linear momentum is also a conserved quantity, meaning that if a closed system is not affected by external forces, its total linear momentum cannot change. Although originally expressed in Newton's second law, the conservation of linear momentum also holds in special relativity and, with appropriate definitions, a (generalized) linear momentum conservation law holds in electrodynamics, quantum mechanics, quantum field theory, and general relativity. In relativistic mechanics, non-relativistic linear momentum is further multiplied by the Lorentz factor



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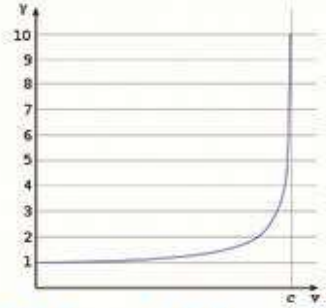
Lorentz velocity correction Factor

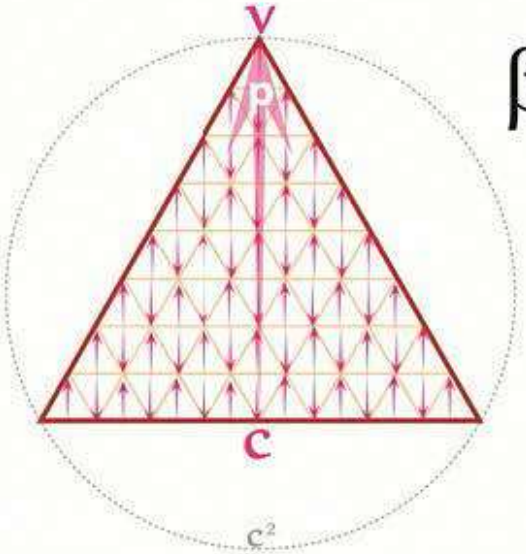
The Lorentz factor or Lorentz term is an expression which appears in several equations in special relativity. It arises from deriving the Lorentz transformations. The name originates from its earlier appearance in Lorentzian electrodynamics - named after the Dutch physicist Hendrik Lorentz.

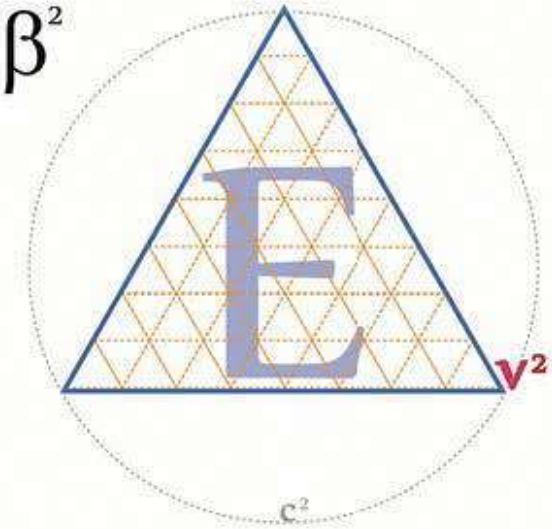
Wavelength, momentum

mass-ENERGY

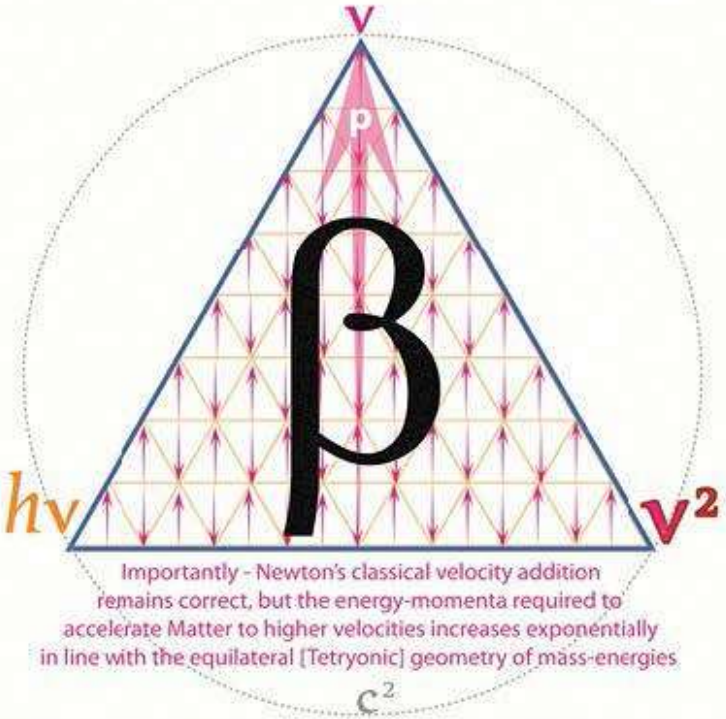
$$\beta = \left[\frac{v}{c}\right] \qquad \left[\frac{v^2}{c^2}\right] = \beta^2$$







Classically modelled as an infinite series approaching c
Tetryonics reveals it to be a physical property
of equilateral energy-momenta geometries



A vector measure of the Energy content of a waveform

$$\gamma \equiv \frac{c}{\sqrt{c^2 - v^2}} = \frac{1}{\sqrt{1 - \beta^2}} = \frac{\mathrm{d}t}{\mathrm{d}\tau}$$

γ

A scalar measure of a KEM waveform's energies

$$\gamma = 1/\sqrt{1 - v^2/c^2}$$

Γ

Importantly - Newton's classical velocity addition remains correct, but the energy-momenta required to accelerate Matter to higher velocities increases exponentially in line with the equilateral [Tetryonic] geometry of mass-energies

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Unified Energy momenta geometry

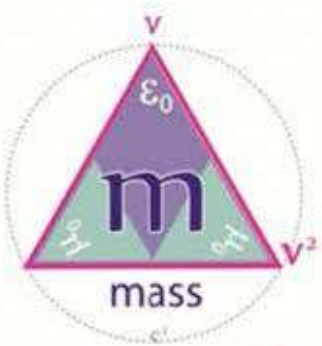
$$m = n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

$$p = n\pi\left[m\Omega v\right]$$

linear momentum — quantised angular momentum

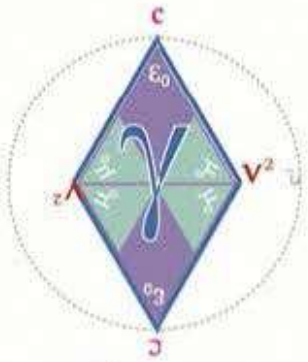
$$E = n\pi\left[\left[m\Omega v\right]^2\right]$$

linear momentum — quantised angular momentum



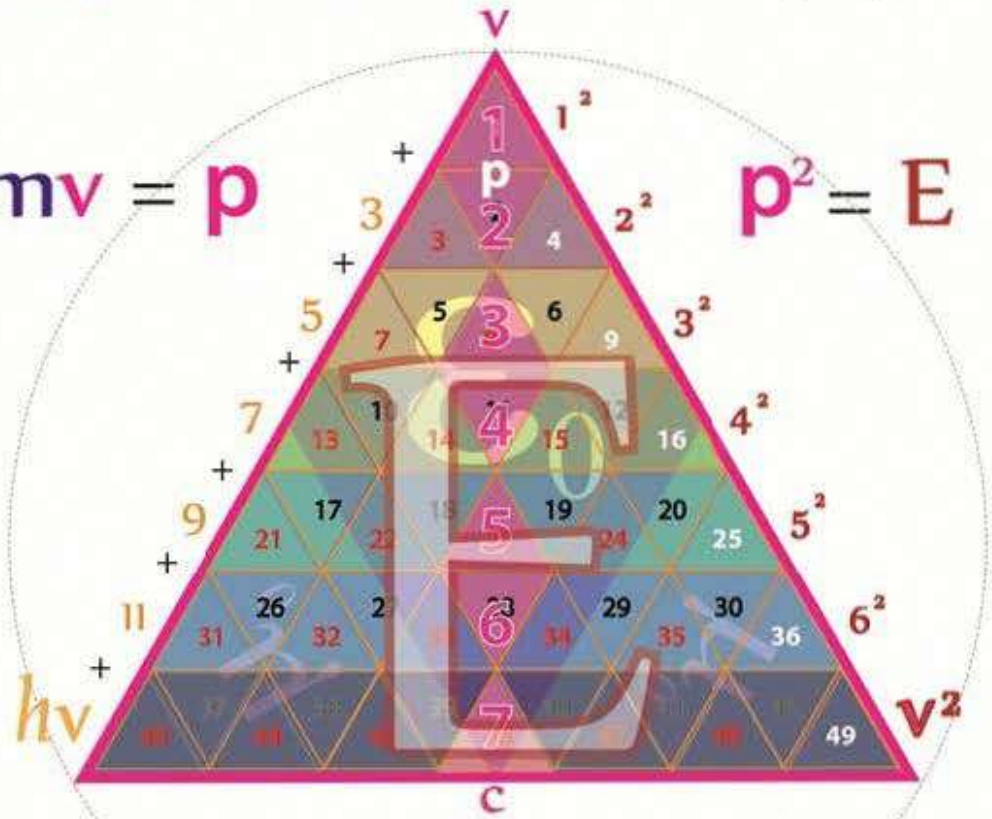
$$\beta = \left[\frac{v}{c}\right]$$

Linear
Lorentz factor



$$E_\gamma = 2\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

$mv = p$ $\quad$ $p^2 = E$



Tetryonic's equilateral geometries model
EM mass-ENERGY momenta
in all its forms

c^2

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

Scalar
Lorentz factor

$$m = 4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

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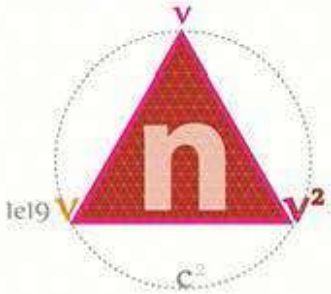
Squared Energy distributions



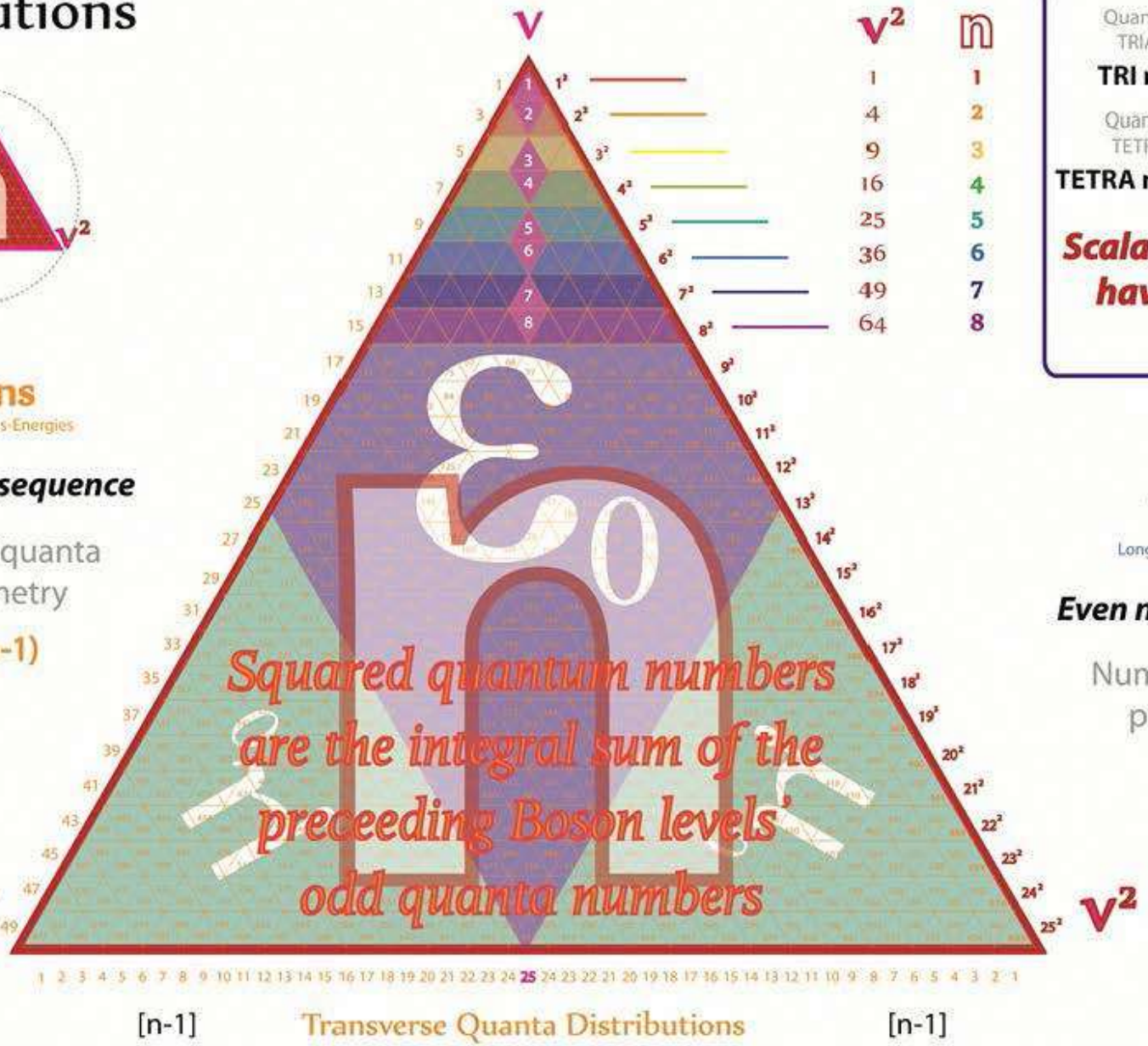
Bosons

Transverse EM mass-Energies

Odd number sequence

Number of quanta per geometry

n = (2n-1)


v
v²
n
1 1 1
2 4 2
3 9 3
4 16 4
5 25 5
6 36 6
7 49 7
8 64 8
Squared quantum numbers are the integral sum of the preceeding Boson levels' odd quanta numbers
hv
v²
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
[n-1]
Transverse Quanta Distributions
[n-1]

EM mass-energy

Quantum numbers are ***not*** TRIANGULAR NUMBERS

TRI n = (n/2) x (n+1)

Quantum numbers are ***not*** TETRAHEDRAL NUMBERS

TETRA n = (n/6) (n+1) (n+2)

Scalar energy levels have SQUARED quanta

Photons

Longitudinal EM mass-Energies

Even number sequence

Number of quanta per geometry

n = (2n)

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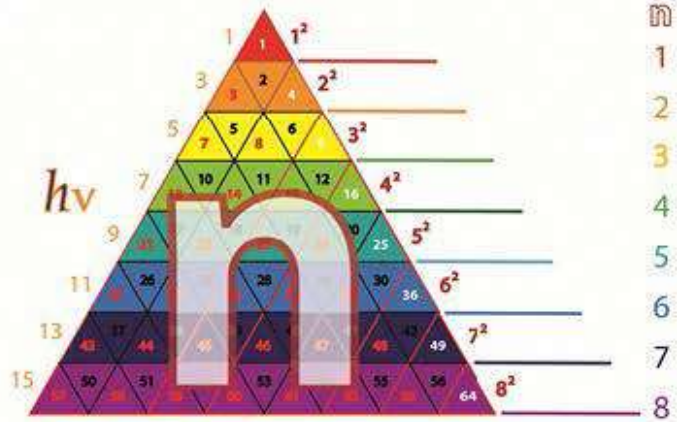
Tetryonic Energy and Charge relationships

Quantised angular momenta is the geometric source of all mass-Energy-Matter relationships

Scalar energies
(are 'squared' numbers)



The Energy density of a particle's charged fascia geometry determines its mass

m Charged mass-energy geometry & Matter topology determines a particle's physical characteristics (Type, Family, generation, mass etc) **M**

Charge

-12

Opposite nett elementary charge geometries

+12

electron

12 [0-12]

1.2 e20

mass-Matter

e-

8.851486 e-31 KG

1875x (differential)

differing Matter topologies

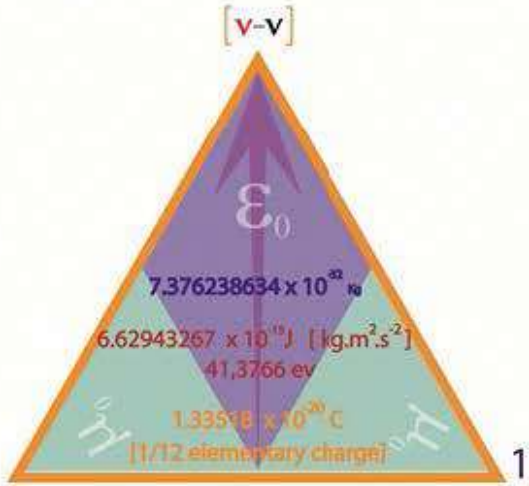
Proton

12 [24-12]

2.25 e23

1.65965 e-27 KG

P+



Planck mass-energy

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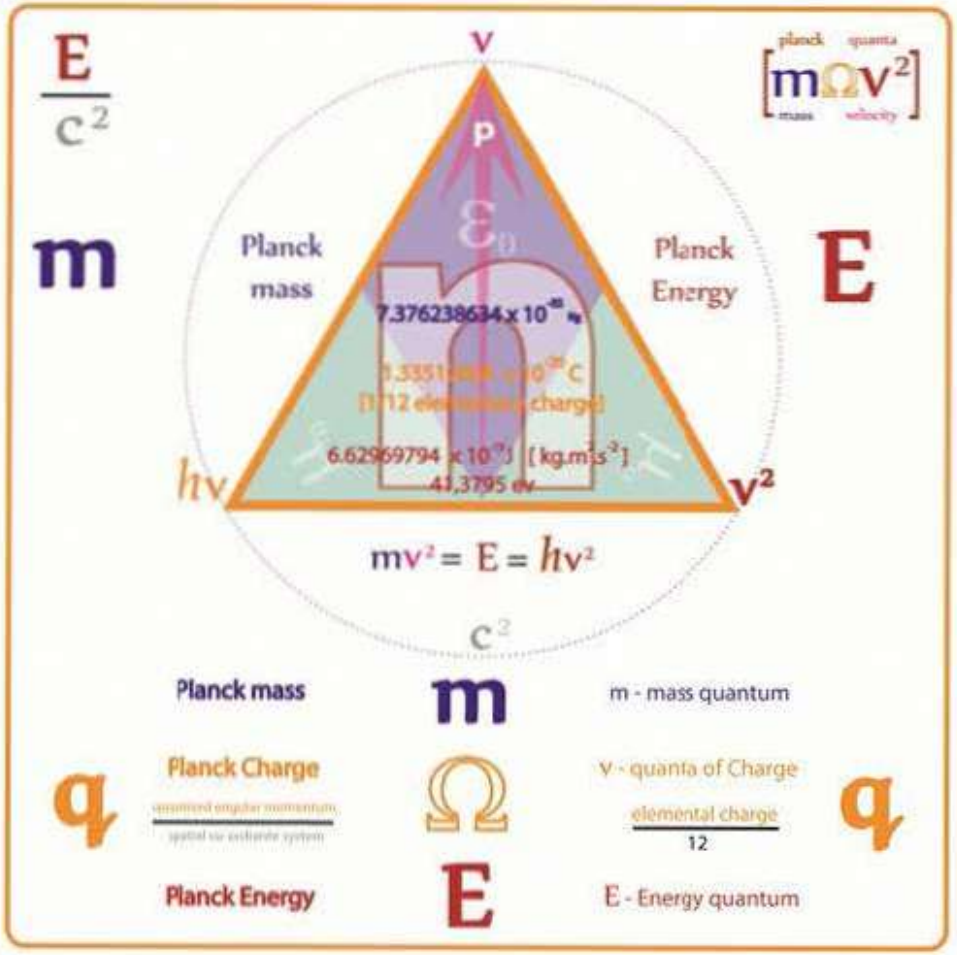
Planck's energy momenta quantum



ν^2 — Compton Frequency — $\frac{mc^2}{h}$ — 1×10^{19} quanta per second

λ — de Broglie wavelength — $\frac{h}{mc}$ — $2.99792458 \times 10^{-11}$ meters

p — Momentum — mc — 2.21134×10^{-23} Kgs

Planck's constant is the equilateral geometry of rest mass-energy momenta in standing wave Matter topologies

Currently the Atomic masses are calculated using 1/12 of a Molar Carbon12 atom's mass as the reference mass.

Tq [Carbon] - [252-252] C [270,072] / 12
Tm [Carbon] - 270,072 12 22,506

If we calculated for the molar mass of C12 in 12 grams we would get
[252-252/270072] $7.378205107 \times 10^{-27}$ grams
this is in error by 1/2 of the mass of an electron

Tetryonic mass [Hydrogen] - 2.2512 e23 v

Using Tetryonic geometry we can solve for an exact Compton frequency of any mass-Matter topology and account exactly for all quantum energy contributions to the rest Matter of all electrons and Baryons in any element thus determining exact molar masses exclusive of blackbody radiation, kinetic energies and energies of measurement and avoiding 'weighted' masses

Defining [N] as the number of rest mass Hydrogen atoms in 1gram exactly and makes Avagadro's number the inverse of this number

$$\text{Molar mass} = \frac{H_1 \text{ Atomic mass}}{\text{Avagadro's No.}}$$

$$\text{mass } H_{mol}/Av = \frac{.001}{6.022141579 \times 10^{23}}$$

rest mass Hydrogen = $1.660538841 \times 10^{-27}$ g/mol

$$H_{mole}/m[H] = \frac{1.660738412 \times 10^{-27}}{22,512}$$

n Planck mass = $7.376238634 \times 10^{-32}$ Kg

This is an exact Atomic rest mass as opposed to the current weighted molar Atomic mass estimates [which is incorrect by 1/2 the mass of an electron]

Planck's constant is the 'quantum of action' and also contributes to the mass-energies of radiant EM wave geometries

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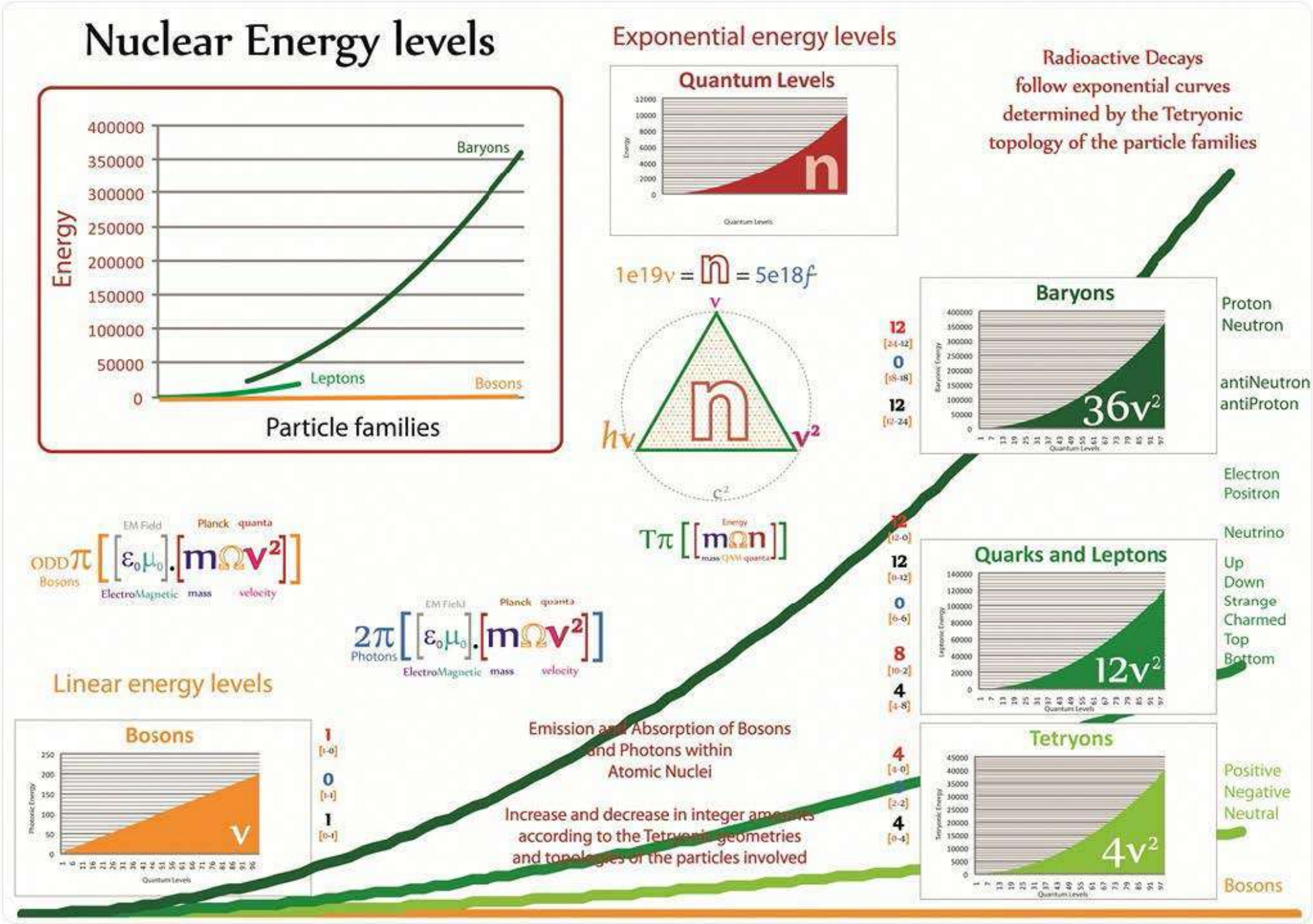

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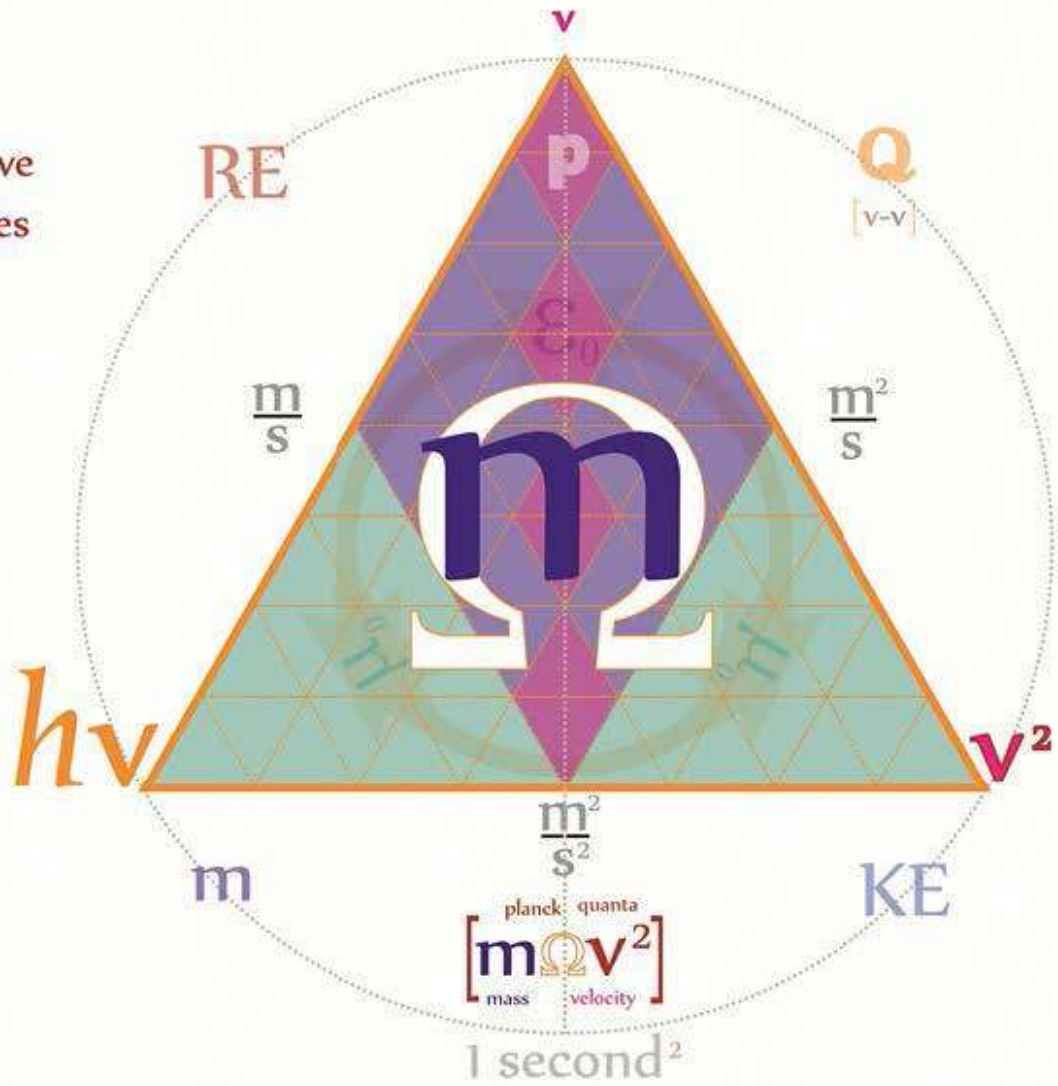
Energy momenta geometry

m

All mass-energies have equilateral geometries



E

mass-Energy

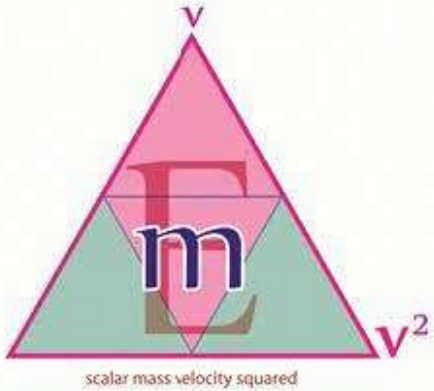
$kg\frac{m^2}{s^2}$

Quantised angular momenta facilitates EM interactions

h

Planck's Constant

$kg\frac{m^2}{s}$



scalar mass velocity squared

$$mv^2 = E = hv^2$$

quantised angular momenta per second

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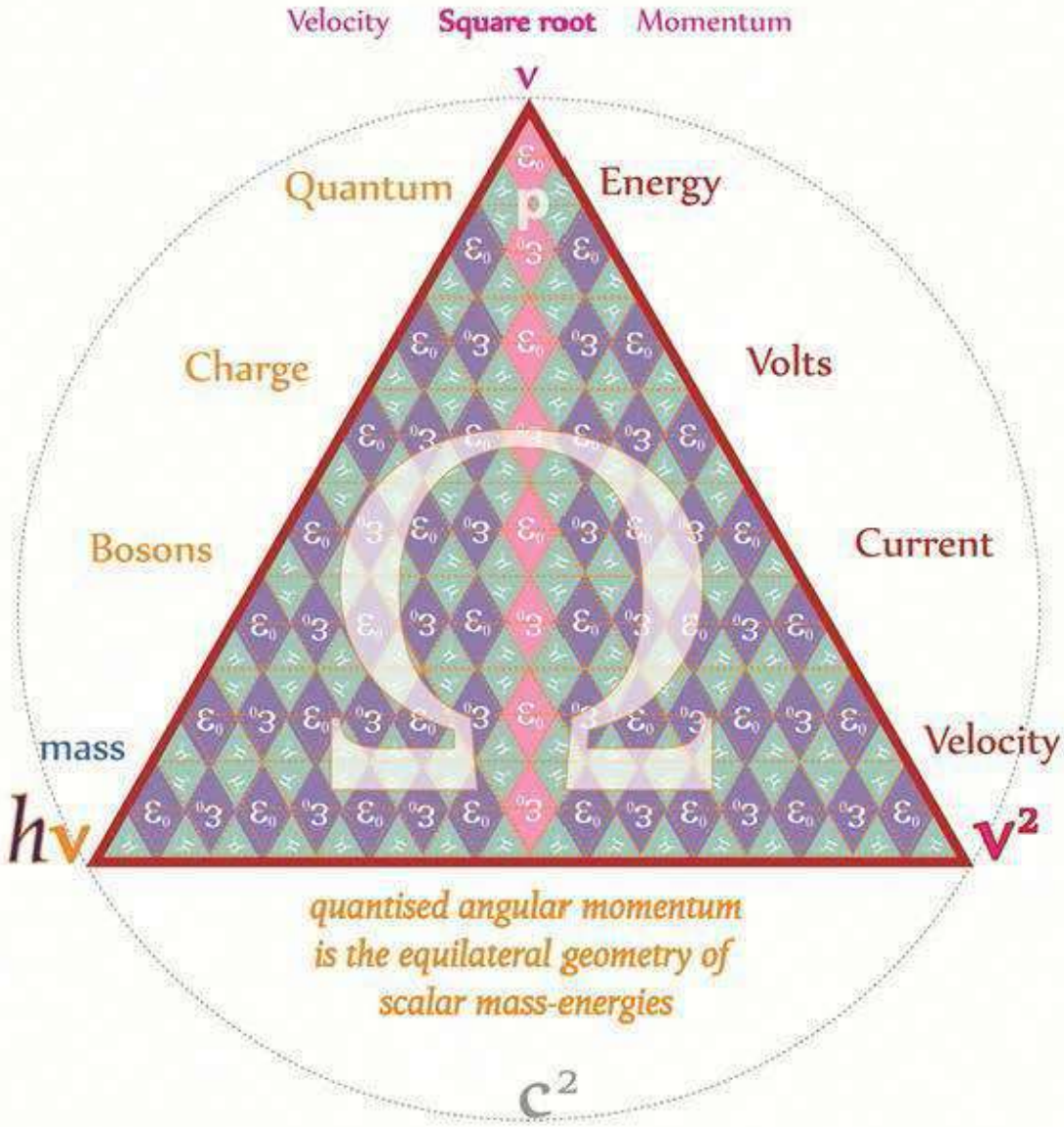
m
mass

E
Energy



Bosons are transverse EM masses

Photons are longitudinal EM masses

mass is a measure of Energy per spatial co-ordinate system

mass-Energy momenta

Electromagnetic energy is a scalar measurement of mass

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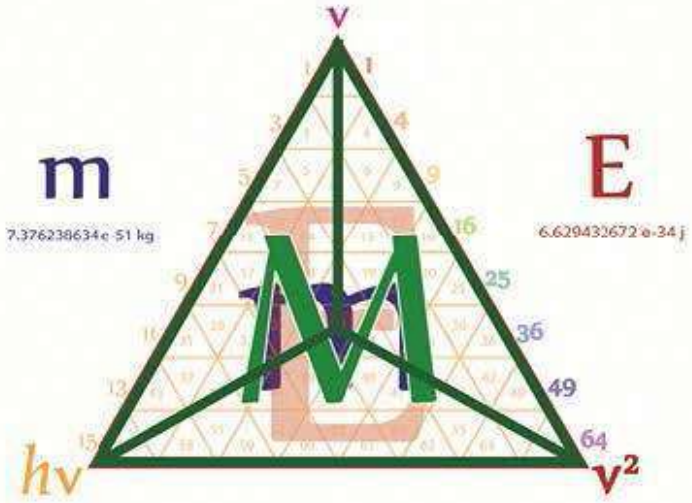
Bosons are
Transverse masses

Planck mass

$$\text{ODD}\ \pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Bosons — EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\Omega v^2$ (mass, velocity)



mass-ENERGY-Matter equivalence

Photons are
Longitudinal masses

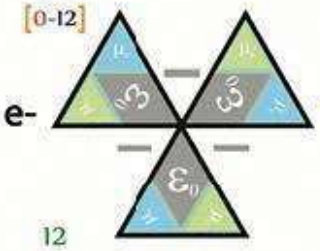
Photons

$$\text{EVEN}\ \pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Photons — EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\Omega v^2$ (mass, velocity)

12 LEPTONS

[0-12]



Tetryonic Matter of Electron - $8.851486361 \times 10^{-31}$ Kg
mass-Energy of Electron - $7.955319207 \times 10^{-14}$ J

$$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Fermions — EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\Omega v^2$ (mass, velocity)

0
[18-18]

P+ **36n** N0

12
[24-12]

Tetryonic Matter of Proton - $1.659653693 \times 10^{-27}$ Kg
mass-Energy of Proton - $1.491622351 \times 10^{-10}$ J

$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Baryons — EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\Omega v^2$ (mass, velocity)

ELEMENTS

0
[42-42]

D n0 45,012

84n

Tetryonic Matter of Deuterium - $3.320192534 \times 10^{-27}$ Kg
mass-Energy of Deuterium - $2.984040234 \times 10^{-10}$ J

$$84\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Deuterons — EM Field: $\varepsilon_0\mu_0$ (ElectroMagnetic) — Planck quanta: $m\Omega v^2$ (mass, velocity)

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EM mass quanta in Matter

kg

q

$$n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta · mass · ElectroMagnetic · mass · velocity

KG

f

mass

1

¼M

½M

ODDπ

EVENπ

v

ε_0

M

v

v²

c⁴

$$ODD\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Bosons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

$$EVEN\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM waves · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

Q

3m

4m

M

4

Matter

$$4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Matter · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

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Lorentz velocity corrections

[result from the measurement of EM mass-energy quanta in a planar spatial co-ordinate system]

$$\beta = m\left[\frac{v}{c}\right]$$

[Linear momentum corrections are linear]

$$\beta^2 = m\left[\frac{v^2}{c^2}\right]$$

[EM mass-Energy corrections are Scalar]

$$m \quad \frac{E}{c^2} = \frac{[m\Omega v^2]}{c^2} = n\pi\left[[\varepsilon_0\mu_0].[m\Omega v^2]\right] \quad \left[\frac{1}{c^2}\right]E$$

Energy; mass quanta; EM Field; planck quanta; mass; ElectroMagnetic; velocity

$$p \quad mv = \left[\frac{E}{v^2}\right].v = n\pi\left[[\varepsilon_0\mu_0].[mv]\right] \quad \frac{E}{v}$$

EM Field; Planck quanta; linear momentum; ElectroMagnetic; mass; velocity

$$E \quad mv^2 = \frac{mv^2}{c^2} = 4n\pi\left[[\varepsilon_0\mu_0].[mc^2]\right] \quad m\left[\frac{c^2}{c^2}\right]$$

EM Field; Energy; Matter; ElectroMagnetic; mass; velocity

mass-energy in Matter propagates at c

EM Field

$$KE \quad 1/2\,Mv^2 = 1/2\left[4\left[\frac{[m\Omega v^2]}{c^2}\right]\right] = 2\pi\left[[\varepsilon_0\mu_0].[m\Omega v^2]\right] \quad 2m\left[\frac{v^2}{c^2}\right]$$

Energy; mass quanta; EM Field; planck quanta; Photons; ElectroMagnetic; mass; velocity

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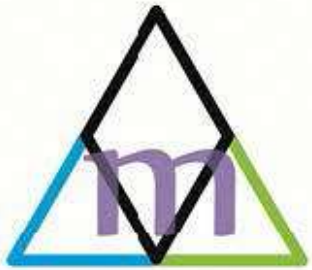
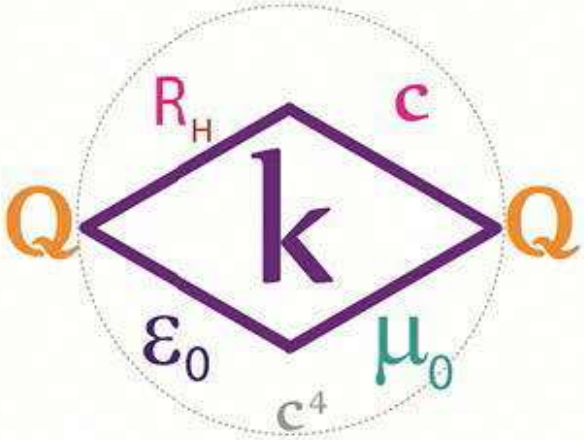
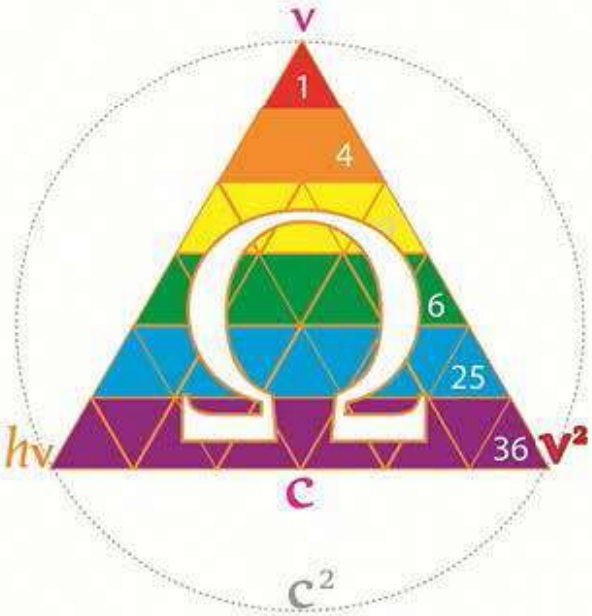
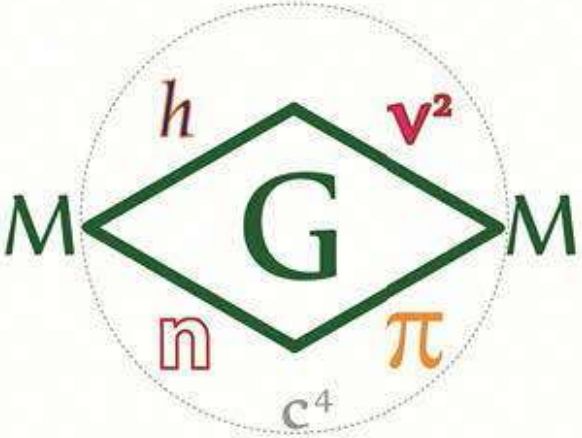
The geometry of Constants

Quantised angular momentum is the source of all physical Constants



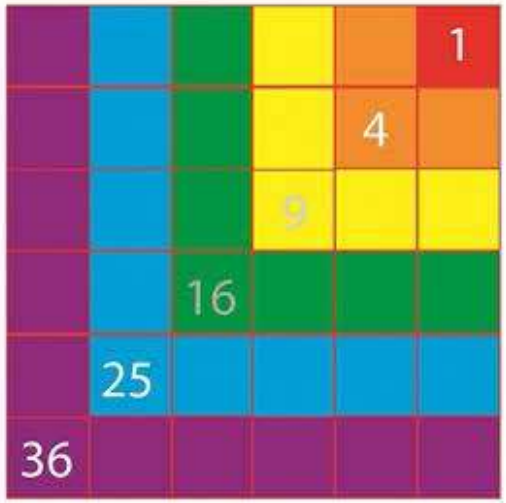


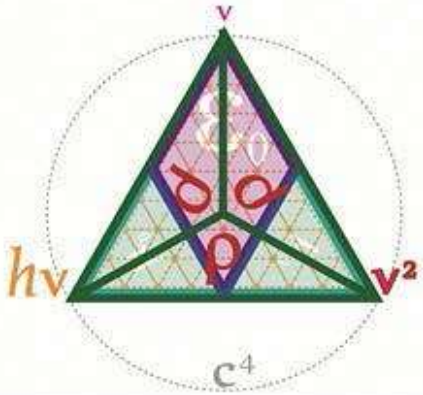


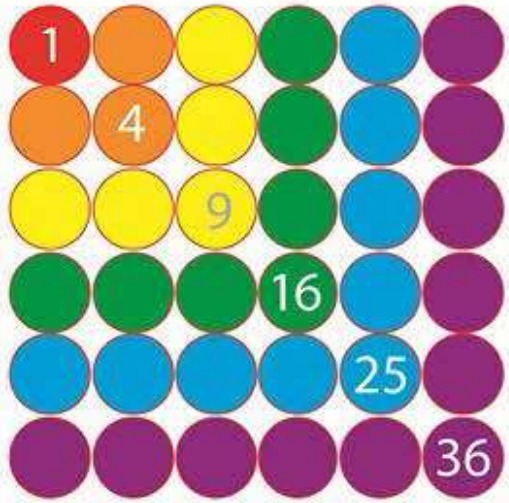


A physical constant is a physical quantity that is generally believed to be both universal in nature and constant in time.

It can be contrasted with a mathematical constant, which is a fixed numerical value but does not directly involve any physical measurement







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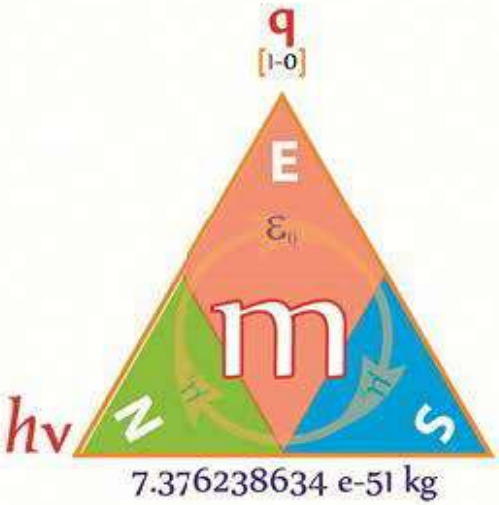


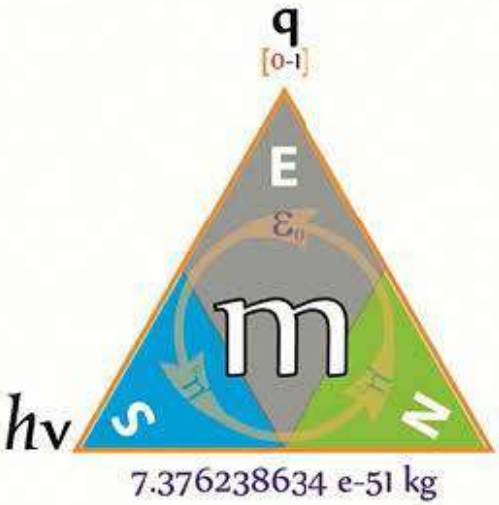
Max Planck

"To interpret the vibrational energy of N oscillators not as a continuous, infinitely divisible quantity, but as a discrete quantity composed of an integral number of finite equal parts.

(April 23, 1858 – October 4, 1947)

$\varepsilon = nhv$

"Let us call each such part of the energy element h "



Planck's Constant

[quantised mass-energy angular momenta]

N_A

1 mole of Hydrogen atoms has a rest-mass of 1 gram

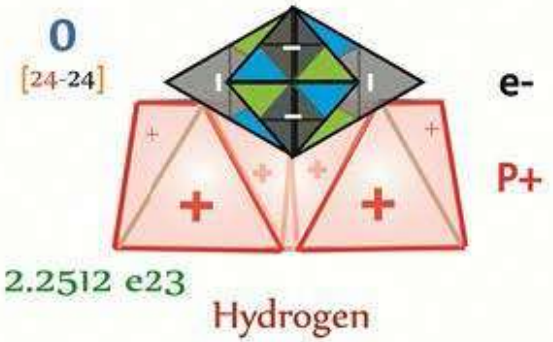
Solving for Planck's Constant using the inverse of Avogadros number & Tetryonic geometry we obtain an exact corrected value of :

$\pm$ $6.629432672 \times 10^{-34}$ J.s

$4.137664546 \times 10^{-15}$ eV.s

$mv^2 = E = hv^2$

A rest mass Hydrogen atom has a Compton frequency of 2.2512 e23 Planck quanta



$$T\pi_{\text{Matter}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

Planck's constant is the relationship between EM mass-energy and quantised angular momenta that provides the basis for EM charge in Tetryonic geometries

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Amedeo Avogadro

(9 August 1776 – 9 July 1856)

Avogadro's Number

The number of rest mass Hydrogen atoms in 1 gram
(and the rest molar mass of any element or compound)
can be determined directly from tetryonic theory

[exclusive of any measurement, blackbody or kinetic energies]

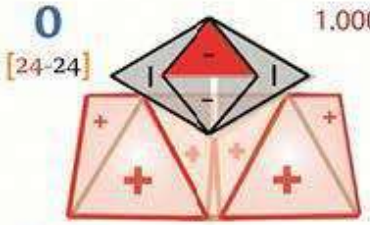
Using a Compton frequency of 2.2512 e23 Planck quanta
for a rest mass-Matter Hydrogen atom

atomic mass unit

$$1\ \mathrm{u} = \frac{M_\mathrm{u}}{N_\mathrm{A}} = 1.660\,538\,782(83) \times 10^{-24}\ \mathrm{g}$$

Avogadro N = 6.022141579 x 10^23

$$N^{-1} = \frac{2.2512\ e23\ v}{[\text{Hydrogen mass}]\ 1.660538841 \times 10^{-24}\ \mathrm{g}}$$



n0 *1 mol = 1 g*

Hydrogen = 1.660538841 x 10^-27 Kg

n1 *1 mol = 1.000533 g*

n0 *1 mol = 11.996801 g*

Carbon 12 = 1.99211552 x 10^-26 Kg

n1 *1 mol = 12 g*

Hydrogen's rest Tetryonic mass is 22,512 n Planck quanta [Proton - 22,500n + electron 12n]

$$\left[22{,}512\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]\right]^{-1}$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

The inverse mass of Hydrogen is equal to Avogadro's number

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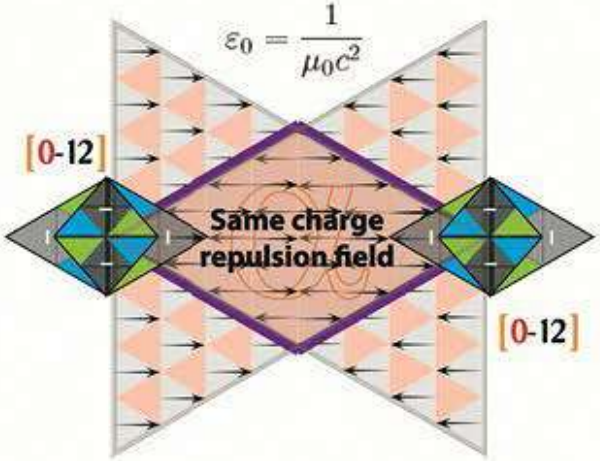
Coulomb's Constant

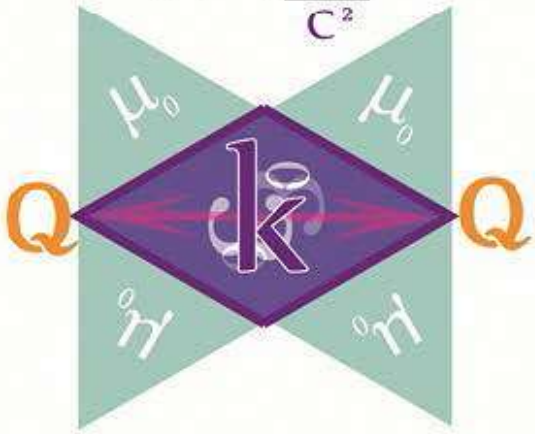
$$k = \frac{1}{4\pi\varepsilon_0}$$

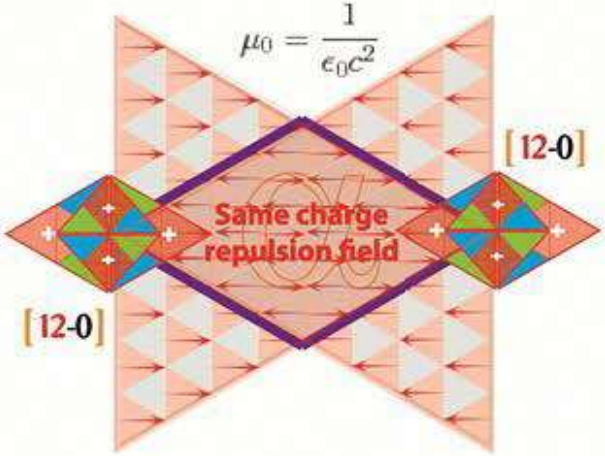
The proportionality constant ke, called the Coulomb constant (sometimes called the Coulomb force constant), is related to defined properties of EM Energy-momenta and is used to define Electric field forces

$$c = \frac{1}{\sqrt{\mu_0\varepsilon_0}}$$

$$8.987\ e9\ \frac{Nm^2}{C^2}$$







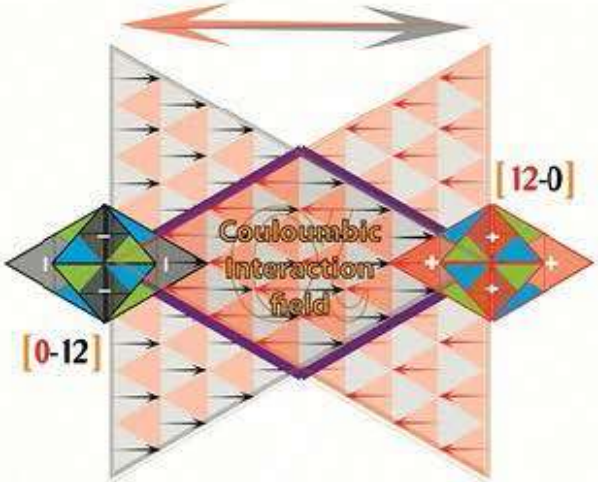
Similars repel

Linear Coulombic force interactions are a result of charged E field linear momenta

$$\mathbf{E} = \frac{\mathbf{F}}{q_t}$$

The Electric field can be defined as the longitudinal Force exerted by charged masses

Opposites attract



It is a measure of the interactive force produced by the Electric field energy-momenta of two superpositioned charge KEM fields

Similars repel

Longitudinal E field forces between Charged particles are mediated by Photons

$$\mathbf{E} = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}\hat{\mathbf{r}}$$

The Electric field can also be derived from Coulomb's Law

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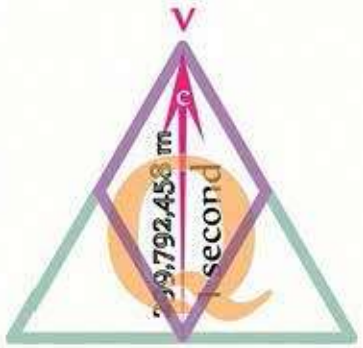
The Speed of ElectroMagnetic energies

The classical behaviour of the electromagnetic field is described by Maxwell's equations, which predict that the speed c with which electromagnetic waves (such as light) propagate through the vacuum is related to the electric constant ε0 and the magnetic constant μ0 by the equation $c = 1/\sqrt{\varepsilon_0 \mu_0}$.

c

Celeritas is a Latin word for "swiftness" or "speed". It is often given as the origin of the symbol c, the universal notation for the speed of light in a vacuum

EM



The distance energy travels in 1 second from its source

EM waves and energy momenta can be measured as either Transverse or Longitudinal waveforms with respect to their velocity vector

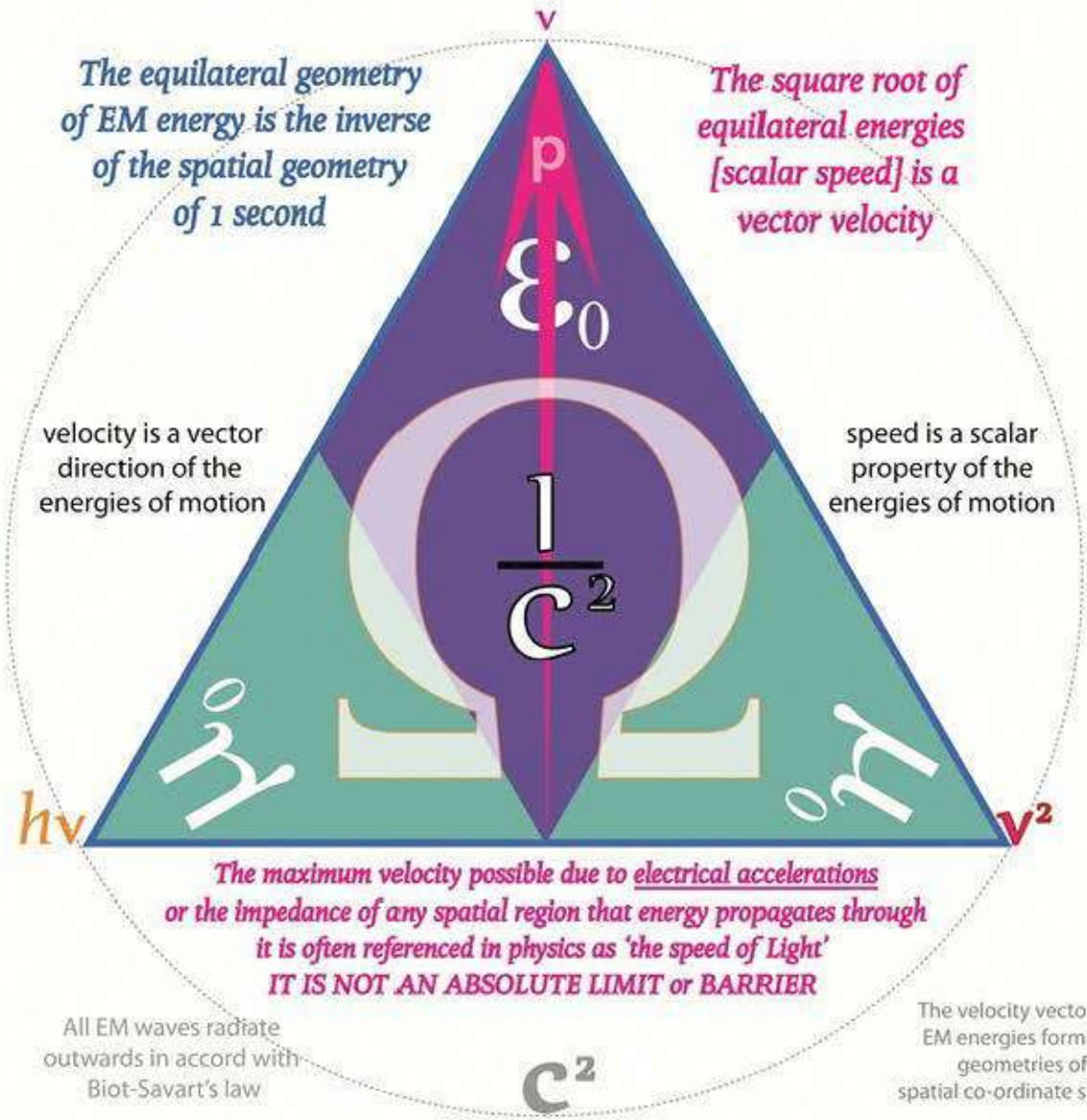
All EM waves and energy are symmetrical waveforms whose quanta contain ElectroMagnetic mass-energy and momenta

The equilateral geometry of EM energy is the inverse of the spatial geometry of 1 second

The square root of equilateral energies [scalar speed] is a vector velocity

velocity is a vector direction of the energies of motion

speed is a scalar property of the energies of motion



The maximum velocity possible due to electrical accelerations or the impedance of any spatial region that energy propagates through it is often referenced in physics as 'the speed of Light' IT IS NOT AN ABSOLUTE LIMIT or BARRIER

All EM waves radiate outwards in accord with Biot-Savart's law

The velocity vectors of EM energies form the geometries of spatial co-ordinate systems

The speed of EM energies in a vacuum is defined as 299,792,458 meters per second (1,079,252,848.8 km/h).

$$\frac{K_E}{K_M} = 9e16 \frac{\frac{N\,m^2}{c^2}}{\frac{N\,s^2}{c^2}}$$

$$c^2 = 9e16 \frac{m^2}{s^2}$$

$$c = 299{,}792{,}458 \frac{m}{s}$$

The natural velocity of EM energies can be calculated from the field's EM permittivity & permeability and is affected by the medium it is propagating through

EM waveforms are bidirectional radiant emissions of 2D energy

with velocity [Lorentz] variable energy contents

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Quantum masses

mass quanta

EM mass-energy quanta

Matter is a KEM standing wave propagating at c

EM Field: $[\varepsilon_0 \mu_0]$ 1.02650056 e-17 s2 m-2

planck quanta: $[m \Omega v^2]$ (mass, velocity) 6.629432672 e-34 kg m2 s-2

Permittivity x Energy density

$$\frac{E}{c^2} = m$$

mass = 7.376238634 x 10^{-51} Kg

Planck-Einstein

$$h\nu^2 = E = m\nu^2$$

$$\text{kg}\,\frac{\text{m}^2}{\text{s}}\,\frac{1}{\text{s}} \qquad \text{kg}\,\frac{\text{m}^2}{\text{s}^2} \qquad \text{kg}\,\frac{\text{m}^2}{\text{s}^2}$$

The quantum of mass-energy can be derived with several methodolgies using Tetryonic Geometry

Planck mass-energy geometries

quantised energy momenta

$$h$$

$$\text{kg}\,\frac{\text{m}^2}{\text{s}}$$

6.629432672 e-34 J

Planck quanta: $[m \Omega v^2]$ (mass, velocity)

7.376238634 e-51 kg

$$\text{kg}\,\frac{\text{m}^2}{\text{s}^2}$$

$$\text{m}$$

scalar mass-energy

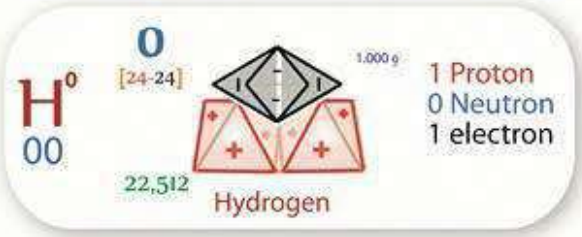
Charged mass-Matter topologies

The mass of Matter $T\pi \left[[\varepsilon_0 \mu_0] . [m \Omega v^2] \right]$

EM Field: ElectroMagnetic; Planck quanta: mass, velocity

Matter Quanta

Tetryonic molar mass [Hydrogen] - 1 g



$$\text{Molar mass} = \frac{\text{H}_1 \text{ Atomic mass}}{\text{Avagadro's No.}}$$

$$\text{mass H}_{mol}/\text{Av} = \frac{.001}{6.022141579 \times 10^{23}}$$

$$= 1.660538841 \times 10^{-27} \text{ g/mol}$$

$$\text{H}_{mole} / \Delta[\text{H}] = \frac{1.660538841 \times 10^{-27}}{22{,}512}$$

mass = 7.376238634 x 10^{-32} KG

Avogadro - Mandeleev

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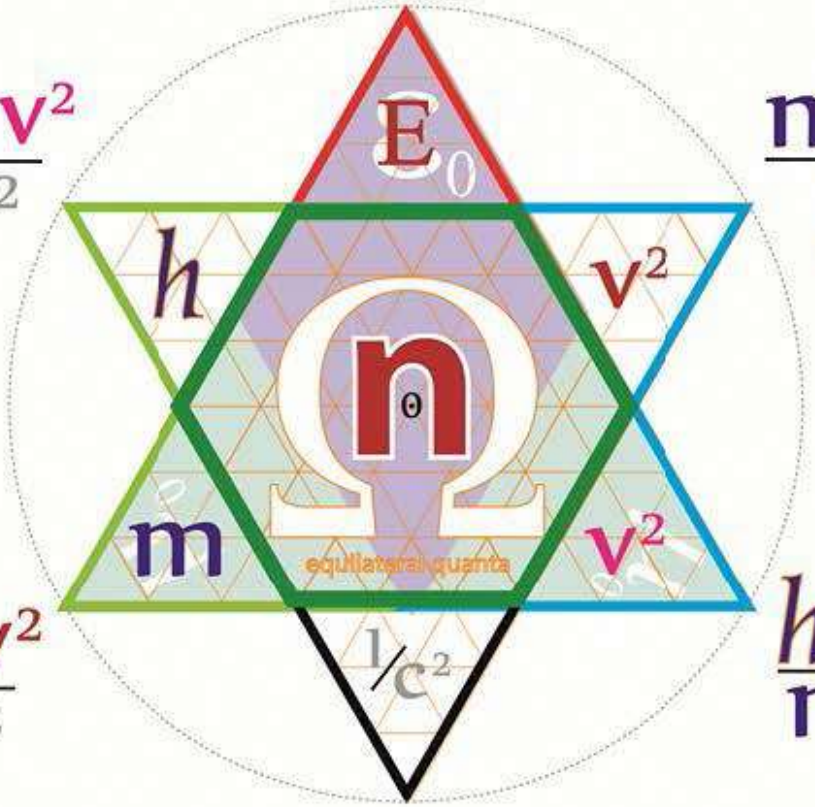
2D mass-Energy equivalence

'The Speed of Light' is the Natural velocity of Energy propagation

Energy $mv^2 = hv^2$ **EM mass**



$\frac{mv^2}{c^2}$ $\frac{mv^2}{h}$

$\frac{c^2}{v^2}$ 8.987551787 e16 1.112650056 e-17 $\frac{m}{h}$

$\frac{hv^2}{c^2}$ $\frac{hv^2}{m}$

$\frac{m}{hv^2}$

Photons **Matter**

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Zero Point Fields

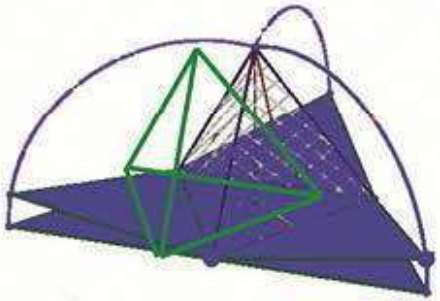
$n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

Quanta · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

$m=1\pi$

[1, 2, 3, 4, 5, 6, 7, 8, 9,10.....]

radiant 4π mass-energy geometries



in standing wave topologies are 3D MATTER quanta

[2D EM masses are planar energy momenta]

Photons

$2n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

Photons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

$m=2\pi$

[2, 8,18, 32, 50, 72, 98,128.....]

The geometry of mass and Matter

[3D Matter has mass-energy momenta and volume]

[1, 3, 5, 7, 9, 11, 13,15, 17, 19.....]

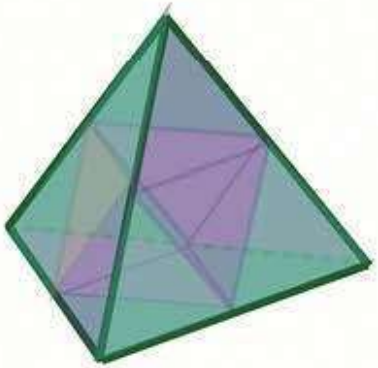
Charge Carriers

$m=3\pi$

$\text{ODD}n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

Bosons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

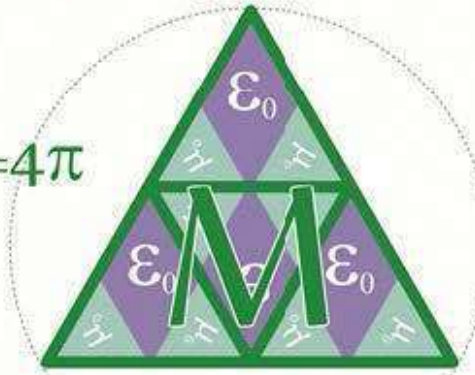
Bosons



3D Matter topologies are standing waves of 2D mass-energies propagating at c

[4, 8,12, 24, 36, 48, 72, 84, 168.....]

$m=4\pi$



$4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

Matter · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

mass-Matter

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mass geometries & rest Matter topology

2D **m** mass **kg**

M Matter **KG** 3D

Quanta number

1e19 v

Compton frequency

Matter is a three dimensional charged mass-energy topology

$$M_{Matter} = 4n\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

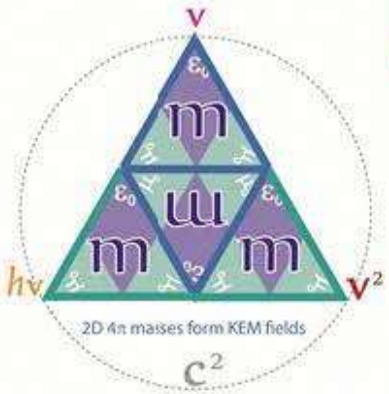
EM Field (ElectroMagnetic) · Planck quanta · mass · velocity

Energy density is mass - the term 'massless particle' is a misnomer

Quantum number

n

Nuclear Level



Kinetic Energies

RE = Matter + KE

Relativistic mass is the total EM energy content of a massive body (or system) in motion

The relativistic rest mass-energies of Matter are velocity invariant as 3D Matter is a EM standing wave with 2D mass- energy fascia whose velocity of propagation is the speed of Light

Matter

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Charge topologies and rest mass-energies

mass-Matter topologies

mass-energy geometries

12

1.2 e20

Electron

n=0

Q

0.00000053 g
molar mass

Tm Electron = 12n

electron Charge	-1.602216081x 10
electron rest mass	8.851486361 x 10
electron rest energy	7.955319207 x 10
	496,519.7

12 **Proton**

2.25 e23

Q
n=25²

0.000999 g
molar mass

Tm Proton = 22,500n

Proton Charge	+1.602216081 x 10
Proton rest mass	1.659653693 x 10
Proton rest energy	1.491622351 x 10
	930,974,522.8

Protons and Neutrons have identical masses to each other and equivalent topologies but differing charges

0

Neutron

2.25 e23

Q
n=25²

0.000999 g
molar mass

Tm Neutron = 22,500n

Neutron Charge	0
Neutron rest mass	1.659653693 x 10
Neutron rest energy	1.491622351 x 10
	930,974,522.8

Hydrogen

When Protons and electrons interact to form neutral Hydrogen the electron's KEM quantum field energies increase in direct proportion to the Proton's energy levels

0

2.2512 e23

n=0

Q
n=25²

1.000533 g
molar mass

Tm Hydrogen = 22,512n

Hydrogen = Proton + electron

H Charge	0
H rest mass	1.660538841 x 10
H rest energy	1.492417883 x 10
	931,967,562.3

0

4.5012 e23

n=0

Q
n=25²

1.999466 g
molar mass

Tm Deuterium = 22,512n

Hydrogen = Proton + electron

H Charge	0
H rest mass	3.320192534 x 10
H rest energy	2.984040234 x 10
	1,862,445.565

quantum synchronous converters

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In order to make an exact 1kg reference mass-Matter topology

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}{}_{\text{velocity}}$$

mass-energy

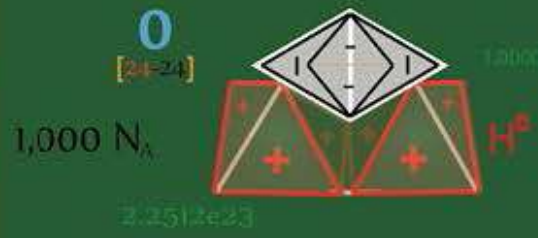
Energy per second

$$mc^2 = E = hv^2$$

$$m = E/c^2$$

mass is the scalar integral surface area of Matter topologies

which is equivalent to exactly 1.000 molar Hydrogen masses



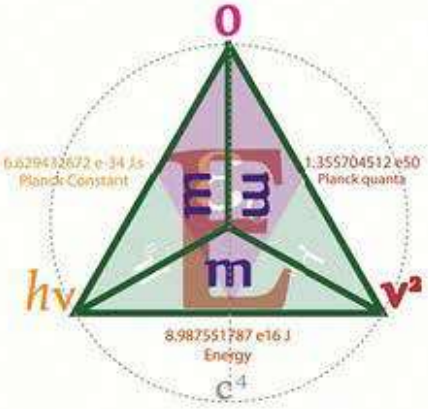
whose Tetryonic Matter topology can be modelled using charged Planck mass-energy geometries

$$M = 1{,}000 \times N_A \cdot \frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}{}_{\text{velocity}}$$

revealing that there are exactly

1.355704512 e50

Planck quanta in standing wave Matter



$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]_{\text{mass}}^{\text{Planck quanta}}{}_{\text{velocity}}$$

Matter-energy

Energy per second squared

$$hv^2 = E = Mc^4$$

$$M = E/c^4$$

Matter topologies are standing-waves of mass-energy

you need to create a standing-EM wave with a specific compton frequency

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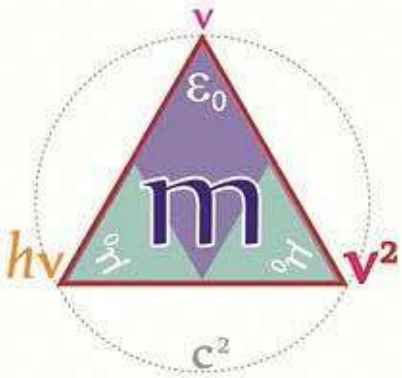
EM mass and Matter defined

There remains a lot of confusion over the exact definition of EM mass and Matter resulting in the frequent interchanging of one term for the other in physical processes

This must be clarified and the two terms must be properly defined in a manner that explains their derivation and physical properties in detail.



$$m = \frac{E}{c^2}$$

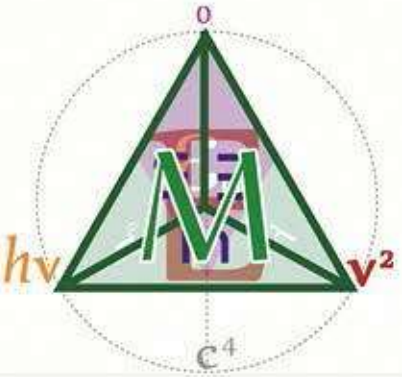
EM mass

3D Matter is comprised of 2D mass-energies

2D mass-energy cannot contain 3D Matter

Matter

$$M = \frac{4\pi E}{c^4}$$



$$n\pi_{\text{mass}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

$$n\pi_{\text{Energy}}\left[\left[m\Omega v^2\right]\right]$$

Planck quanta (mass, velocity)

2D mass-Energies

EM mass is a measure of equilateral scalar energy per unit of Time

$$\beta = \left[\frac{v}{c}\right]$$

mass is the Lorentzian velocity corrected energy content of Tetryonic geometries

All forms of EM mass-Energy are subject to Lorentz factor relationships

$$\beta^2 = \left[\frac{v}{c}\right]^2$$

Matter is Lorentz invariant as its mass-energies propagate in a 4π standing wave geometry

Bosons and Photons are not 'massless' they are 'Matterless' [2D waveforms]

Bosons

$$m_p = \frac{hv}{c^2}$$

Planck masses

$$\text{ODD}\,\pi_{\text{Bosons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

Photons

$$m_\gamma = \frac{hf}{c^2}$$

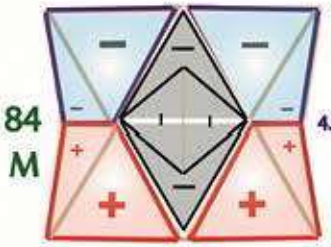
Photon mass

$$\text{EVEN}\,\pi_{\text{EM waves}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

$$4n\pi_{\text{Matter}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

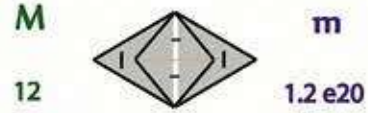
EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)



$$84\pi_{\text{Deuterium}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

Matter is the 3D topology of standing wave 2D mass-energies

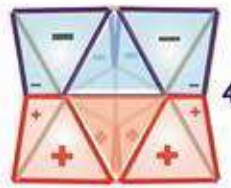


$$12\pi_{\text{electrons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]\ e^-$$

$$+$$

$$72\pi_{\text{Nuclei}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]\ \text{Deuteron}$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)



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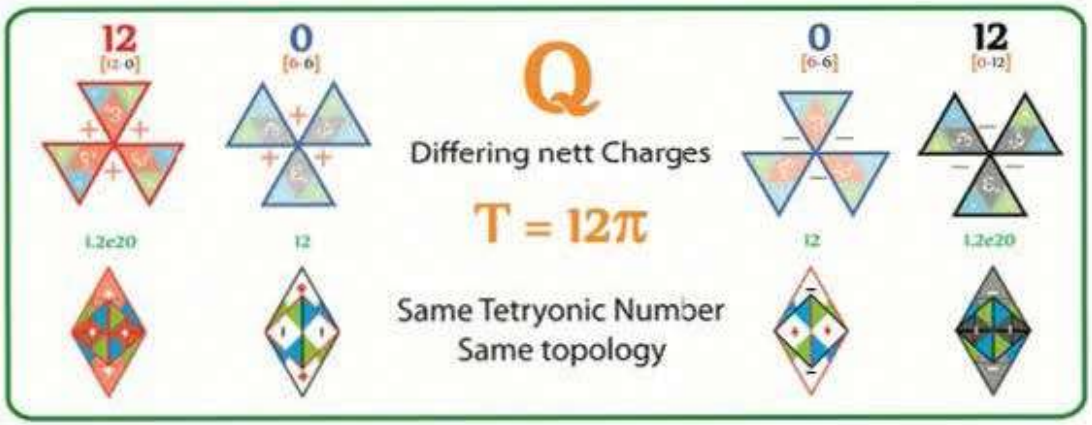
Charged mass-Matter geometries



Matter Topology is determined by the geometry of charged Planck T[q] quanta

Any measurement of a system's mass is subject to velocity corrections

mass = EM energy density

$$n\pi \left[m\Omega v^2 \right]$$

mass quanta; Planck quanta; mass; velocity; Spatial geometry c^2

n [7.376238634 e-51] kg

EM mass is a measure of 2D planar energies comprising the fascia of charged topologies

ENERGY

$$m \qquad n\pi\left[\left[m\Omega v^2\right]\right] \qquad M$$

Planck quanta; mass; velocity

c^2 2D space

The mass - ENERGY - Matter contents of any physical system are all related through the spatial co-ordinate system used (which in turn is determined by the speed of light)

c^4 3D space

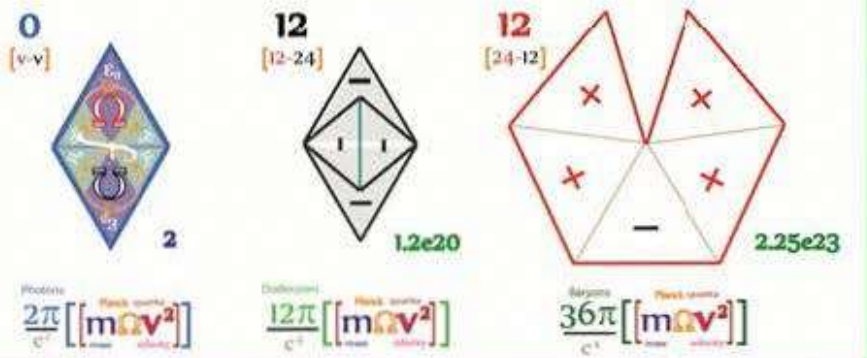
$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right] \qquad E \qquad \frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

mass; Planck quanta; mass; velocity; Matter; Planck quanta; mass; velocity

The Energy content of any physical system remains the same irrespective of the spatial co-ordinates used

Matter and Charge are velocity invariant properties

Differing Tetryonic charge numbers produce differing particle topologies



As the energy content [levels] of particles and fields increase their intrinsic Planck quanta and EM mass increases but their charge geometries remain the same

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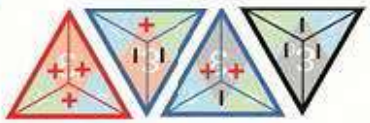
Charged mass-Energies

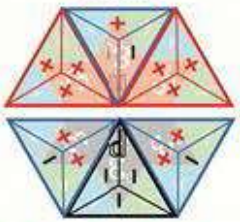
All 3D Matter particles are comprised of charged fascia whose energy content determines their 2D mass

1 ZPFs

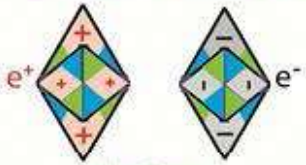
4 Tetryons



Quarks

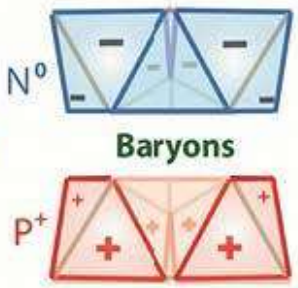


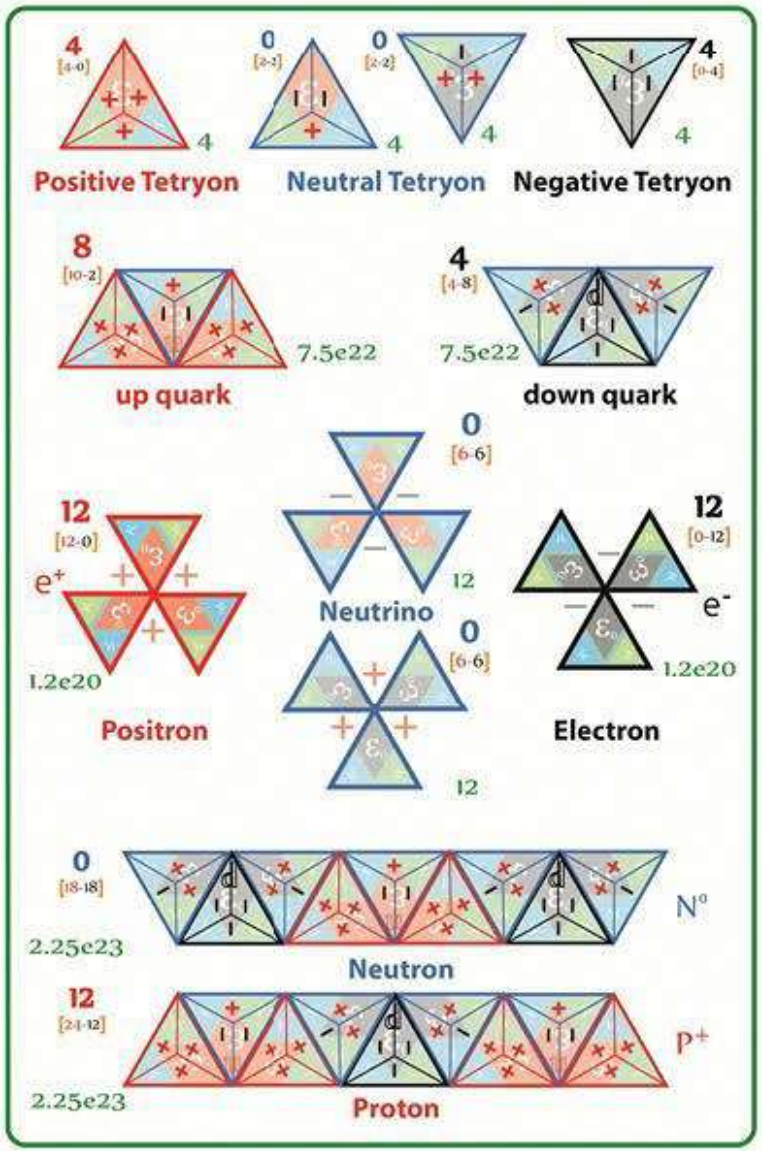
12 Dodecadeltahedrons



Leptons

36 Baryons





3D Matter geometries

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Matter · Planck quanta · mass · velocity

Tetryons 4 charge fascia	4π	$2.651773069 \times 10^{-33}$ J $2.950495454 \times 10^{-50}$ kg 4 quanta
Quarks 12 charge fascia	12π	$4.97207450 \times 10^{-11}$ J $5.532178976 \times 10^{-28}$ kg 7.5×10^{22} quanta
Neutrinos 12 charge fascia	12π	$7.955319207 \times 10^{-33}$ J $8.851486361 \times 10^{-50}$ kg 12 quanta
Leptons 12 charge fascia	12π	$7.955319207 \times 10^{-14}$ J $8.851486361 \times 10^{-31}$ kg 1.2×10^{20} quanta
Baryons 36 charge fascia	36π	$1.491622351 \times 10^{-10}$ J $1.659653693 \times 10^{-27}$ kg 2.250×10^{23} quanta
Deuterium 72 charge fascia ion	72π	$2.984040234 \times 10^{-10}$ J $3.320192534 \times 10^{-27}$ kg 4.5012×10^{23} quanta

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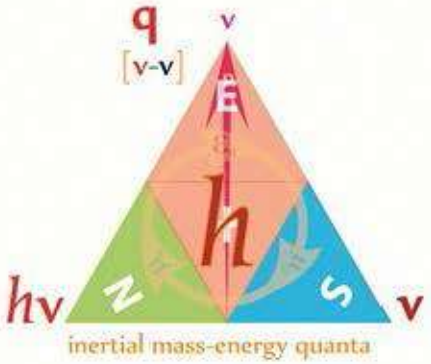
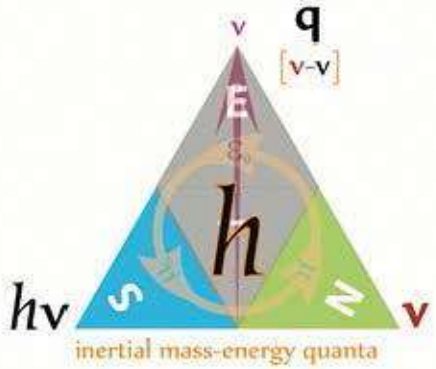


In physics there exists 2 forms of energy momenta [linear momenta & quantised angular]

MOMENTA

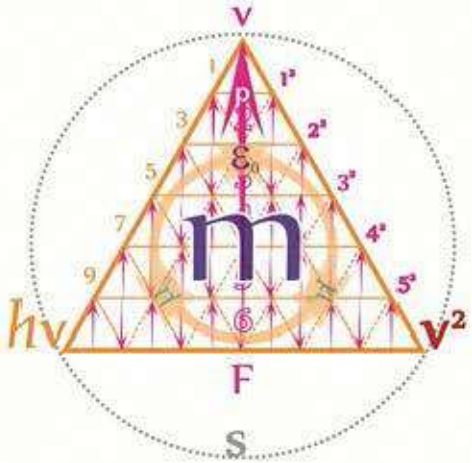
The nett scalar energy momenta required to effect changes in velocity

ENERGY



Net Charge is reflective of the total energy momenta of any EM field or Matter subjected to acceleration [inertial mass]

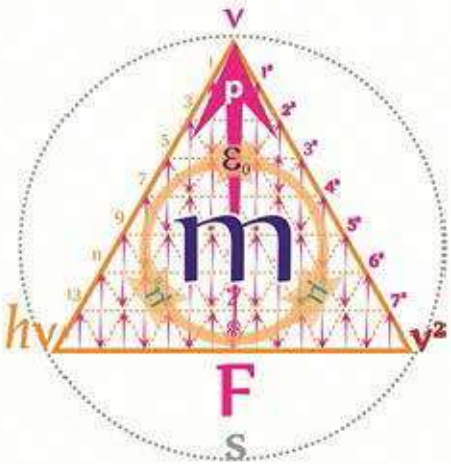
Inertial resistance to Force



Any change in motion results in changes to the Charge geometries creating in turn proportional changes to the nett KEM mass-energy momenta components

$$F=ma$$

The inductive resistance of quanta in charged EM fields to any changes to their nett mass-energy geometry is the source ofwhat we term inertial mass



Inertia is the resistance of any physical object to a change in its state of motion.

Force does work when it results in movement

$$W = F.d = ma.d = E$$

$$kg\,\frac{m}{s^2}\,m$$

classical mechanics — scalar — quantum mechanics

$$\Delta mv = \Delta E = \Delta m\Omega v$$

energies

linear momenta — angular momenta

$$kg\,\frac{m^2}{s^2}$$

The Planck constant is the quantum of Action

$$E = m\Omega v^2 = hv^2$$

$$kg\,\frac{m^2}{s}\,\frac{1}{s}$$

Changing an object's velocity results in a corresponding energy momenta change which relate to each other through its inertial mass

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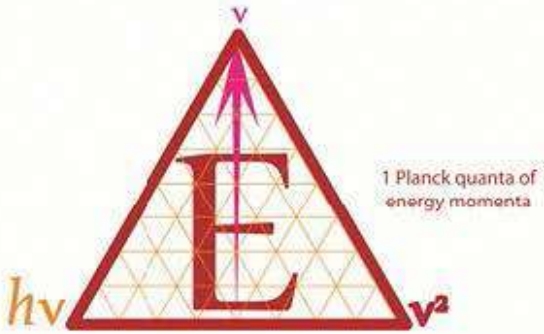
EM field densities



1 Planck quanta of energy momenta

EM mass is a measure of the energy content of any spatial co-ordinate system

$$\beta^2 = \left[\frac{v}{c}\right]^2$$

and is subject to Lorentz velocity corrections in 2D EM fields

6.629432672 e-34 J
1 planck quantum has a EM mass-Energy of
7.376238634 e-51 kg
and
Quantised Angular Momentum which creates Charge
1.33518 e-20 C

mass-Energy equivalence

mass velocity

7.376238634 e-51 kg — 6.629432572e-34 j.s

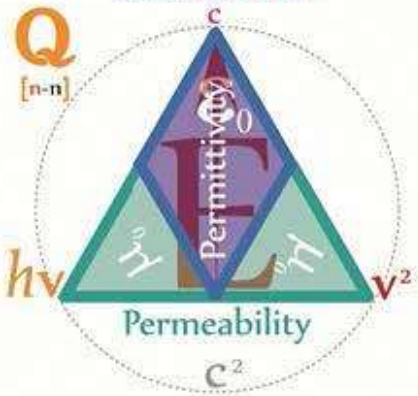
$$mv^2 = E = hv^2$$

8.987551787 e16 [m/s]² — 6.629432672 e-34 j — quanta/sec

Matter is only mass-energy in Tetrahedral topologies [T4π+]
[else it is nπ EM mass-energies that propagate away at c]

planck quanta

6.629432672 e-34 J



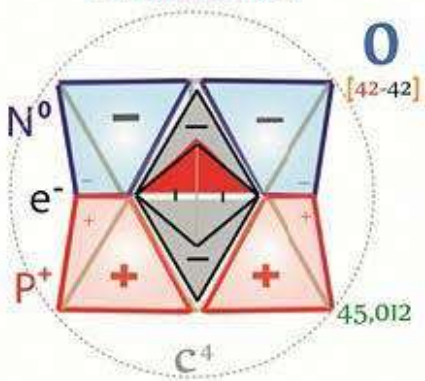
7.376238634 e-51 kg
radiant mass-energies

If reduced to a flat Euclidean space geometry
Matter topologies become radiant mass-energies

m	E	M
mass	ENERGY	Matter
$\left[\frac{n\pi}{c^2}\rho\right]$	$[m\Omega v^2]$ (Planck quanta; mass, velocity)	$\left[\frac{4n\pi}{c^4}\rho\right]$

The inertial properties of electromagnetic mass - ENERGY & Matter
[can all be differentiated as energy densities per unit of time]
in any spatial co-ordinate system

2.984040234 e-10 J



3.320192534 e-27 kg
rest mass-Matter

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EM Field geometries & Matter topologies

m $[odd\pi]hv$

Q [v-v]

$1\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (1π: Charge; $\varepsilon_0\mu_0$: EM Field; $m\Omega v^2$: Planck quanta; ElectroMagnetic mass velocity)

Bosons

2D

Photons

m $[even\pi]hv$

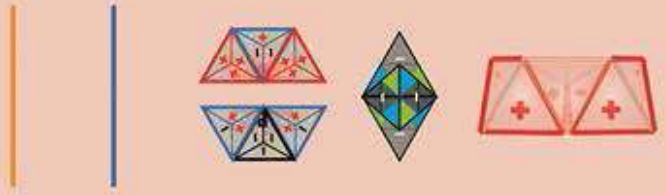
0 [v-v]

$2\pi_{Photons}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field; Planck quanta; ElectroMagnetic mass velocity)

2D planar Euclidean electromagnetic mass-energies propagate through the vacuum energy aether without interaction

$n\pi_{mass}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field; Planck quanta; ElectroMagnetic mass velocity)

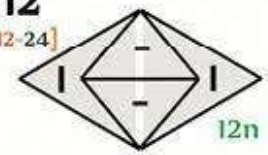
2D Fields **3D Matter**



Tetryonic charged geometries provides a clear mechanism for providing all particles with their distinct properties of 2D inertial EM mass-energy and 3D Matter.

M $[4n\pi]hv$

12 [12-24]



$12\pi_{Dodecyon}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field; Planck quanta; ElectroMagnetic mass velocity)

Leptons

3D

M $[4n\pi]hv$

12 [24-12]

Baryons

$36\pi_{Baryons}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field; Planck quanta; ElectroMagnetic mass velocity)

$T\pi_{Matter}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM Field; Planck quanta; ElectroMagnetic mass velocity)

3D standing wave topologies of electromagnetic mass-energies interact with the vacuum energy aether at various angles through their charged [inductive] fascia

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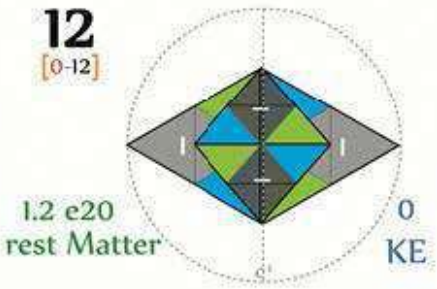
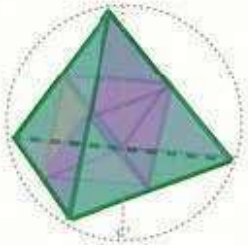
Velocity invariant rest Matter

Electrostatic charges
have no Magnetic Moments



All Matter are 3D
standing wave topologies

$$M = \frac{E}{c^4}$$



$$E = Mc^4$$

rest mass-Matter is composed of 4nπ standing wave topologies and is INVARIANT to velociiy changes

The Relativistic EM mass-energies of a system in motion is the sum of its invariant rest Matter and Kinetic Energies

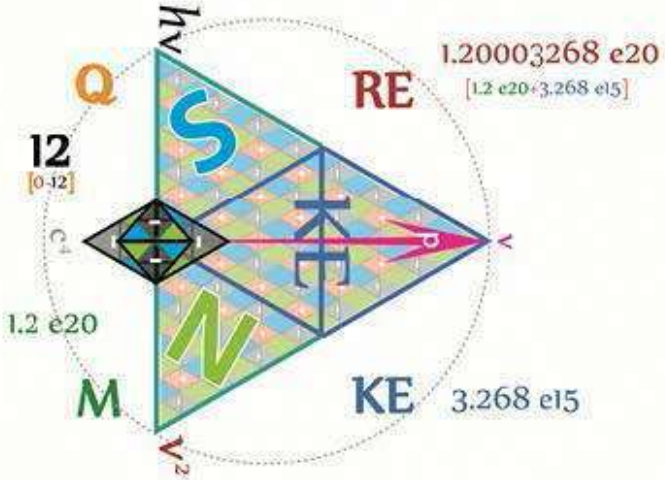
Electron rest Matter Kinetic Energy field

$$RE = \underset{\text{Fermions}}{12\pi}\left[\left[\frac{m\omega v^2}{c^4}\right]\right] + \underset{\text{Photons}}{2\pi}\left[\left[\frac{m\omega v^2}{c^2}\right]\right]$$

EM fields resulting from motion
are subject to Lorentz correction

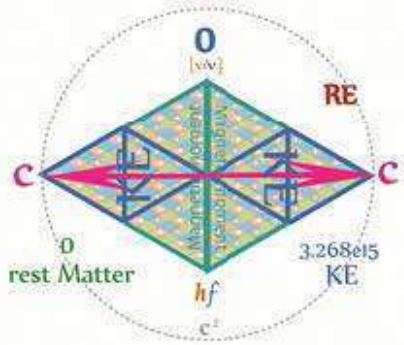
Kinetic mass-energies are divergent from invariant rest Matter topologies as a result of a particle's motion

At zero velocity the relativistic mass is equal to the invariant mass.



The energy which an object has due to its motion will not add mass into the invariant rest Matter of the particle in motion (it increases the total Planck quanta [EM mass-enegies] of its extended KEM field)

Wavelengths are proportional
to EM energy content



Photons are bidirectional
Kinetic EM Fields

$$\frac{E}{c^2} = m$$

Matter in motion has a resultant velocity related Energy field that posseses the physical properties of Kinetic energy and Magnetic moments

$$KEM = Mv^2$$

KEM field Energy is directly related to the Velocity changes of massive particles

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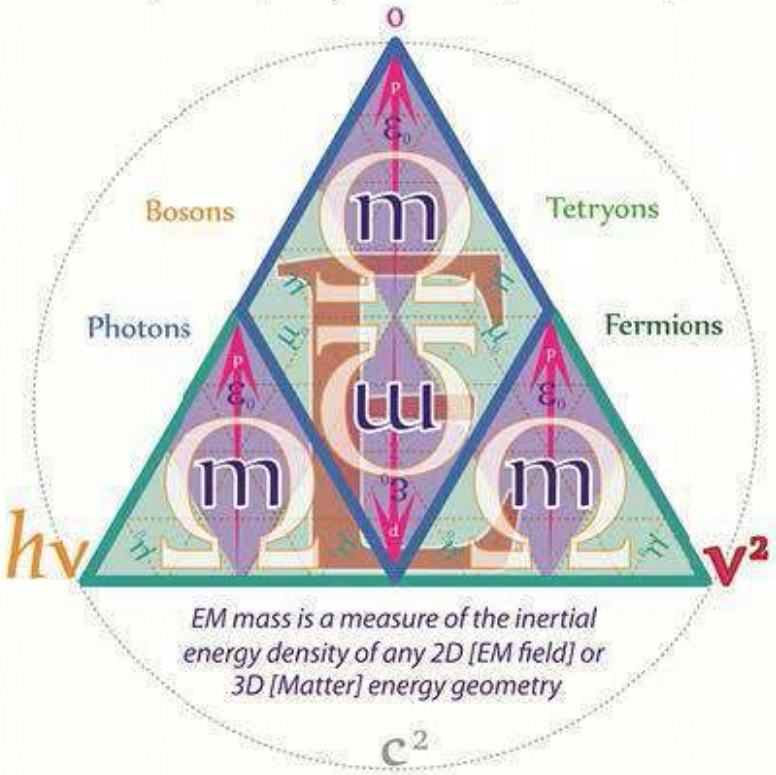
All 2D EM fields and 3D Matter particles have ElectroMagnetic fields, inertial mass-energies & momenta resulting from their constituent equilateral Planck quanta which possess the additional physical properties of Compton Frequency and De Broglie Wavelength



$$m\Omega v^2 = E = mv^2$$

EM mass-energy momenta

The EM mass of an object is a fundamental property of the object; a numerical measure of its inertia; a fundamental measure of the energy density of an object.

mass geometries and Matter Topologies

All 3D Matter topologies contain 2D EM mass-energy geometries
not all 2D EM mass-energy geometries form 3D Matter topologies

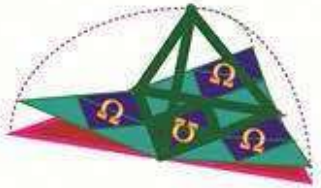
EM mass can be clearly defined as a measure of the energy density of any charged geometry

$$T\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Matter: T; ElectroMagnetic: $[\varepsilon_0\mu_0]$; EM Field; Planck quanta: π; mass: m; velocity: Ωv^2

3D Matter is any mass-energy geometry that creates a closed volume Topology (4nπ Tetryonic geometry)

EM waves [FIELDS] are distinguishable from Material Particles [MATTER] through their non-Tetrahedral topologies



mass-energy is a conserved property
Matter is not conservative

$$\frac{E}{c^2} = m \qquad M = \frac{E}{c^4}$$

The term 'massless' is a misnomer and should be discontinued in its use as all EM fields and Particles have EM mass [Energy quanta per second] geometries [other alternatives could be 2D, EM field, or Matterless]

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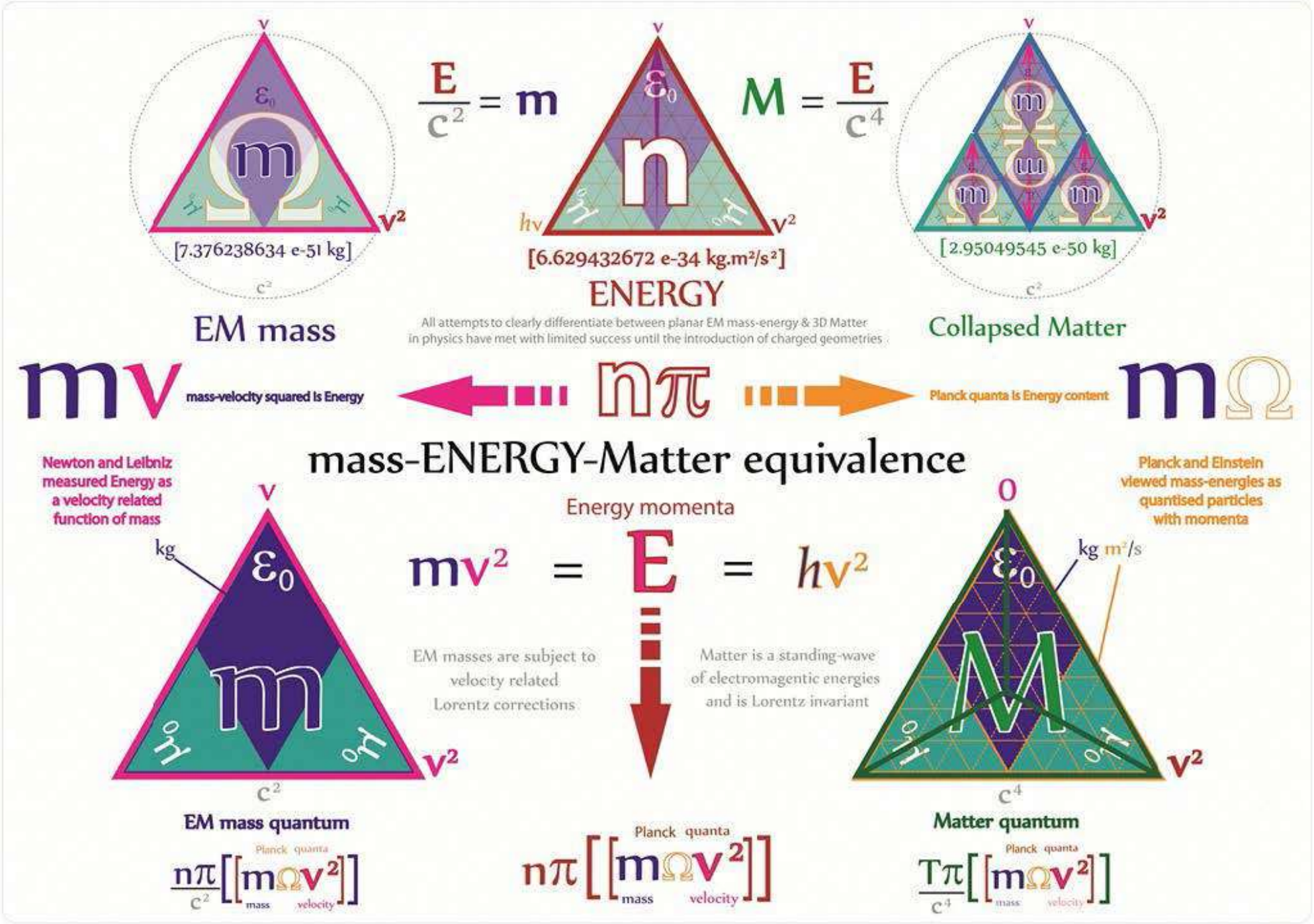
EM mass
[7.376238634 e-51 kg]
$\frac{E}{c^2} = m$
[6.629432672 e-34 kg.m²/s²]
ENERGY
$M = \frac{E}{c^4}$
[2.95049545 e-50 kg]
Collapsed Matter
All attempts to clearly differentiate between planar EM mass-energy & 3D Matter in physics have met with limited success until the introduction of charged geometries
mv
mass-velocity squared is Energy
nπ
Planck quanta is Energy content
mΩ
mass-ENERGY-Matter equivalence
Newton and Leibniz measured Energy as a velocity related function of mass
Energy momenta
Planck and Einstein viewed mass-energies as quantised particles with momenta
$mv^2 = E = hv^2$
EM masses are subject to velocity related Lorentz corrections
Matter is a standing-wave of electromagentic energies and is Lorentz invariant
EM mass quantum
Matter quantum
Planck quanta
mass
velocity

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m
mass geometries

All forms of mass-ENERGY-Matter
are defined by their charged geometries and
the spatial co-ordinate systems used to measure their physics

M
Matter topologies

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$
mass, Planck quanta; mass, velocity

Unified Field Equation
for Tetryonic EM mass-Energy-Matter

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$
Matter, Planck quanta; mass, velocity

$$T\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$
Tetryonic geometry; EM Field ElectroMagnetic mass; Planck quanta velocity

$n\pi$ mass $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ ElectroMagnetic mass velocity

ODDπ Bosons $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

2π Photons $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

EVENπ EM waves $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

bosons & photons

$n\pi$

EM waveforms

spatial co-ordinate systems
are defined by the velocity of energy

Fermions

$T\pi$

Particles

4π Tetryons $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

12π Dodecyons $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

24π Mesons $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

36π Baryons $\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$

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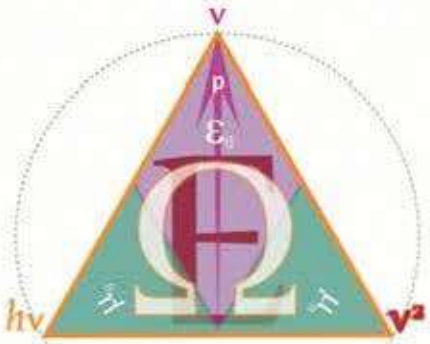
EM mass

Matter

m

M



$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]_{\text{mass}\quad\text{velocity}}^{\text{mass}\quad\text{Planck quanta}}$$

$$n\pi\left[m\Omega v\right]^2_{\text{energy}\quad\text{mass}\quad\text{velocity}}\quad\text{Planck quanta}$$

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]_{\text{mass}\quad\text{velocity}}^{\text{Matter}\quad\text{Planck quanta}}$$

Classical Mechanics

Quantum Mechanics

Tetryonic unified field Geometry

p

mass velocity

7.376238634 e-51 kg

$$mv^2 = E = hv^2$$

8.987551787 e16 $[m/s]^2$ 6.629432672 e-34 j quanta/sec

6.629432672e-34 j.s

mass-Energy momenta equivalence

planck quanta

h

The equilateral geometry of quantised angular momentum is the key to understanding Energy

$kg\frac{m}{s}$

mv

$m\Omega$

$kg\frac{m^2}{s}$

linear momentum

charge

quantised angular momentum

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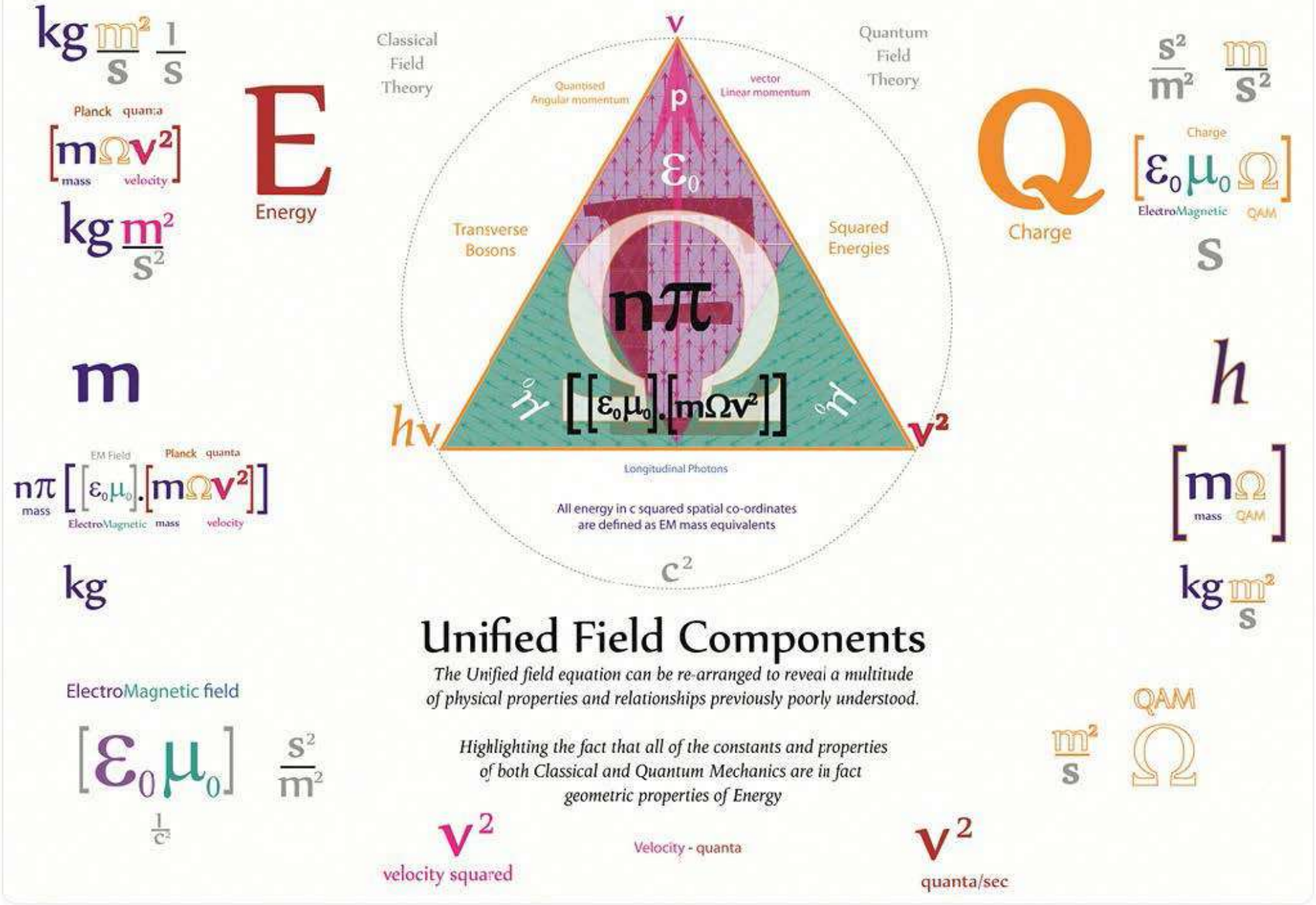

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EM mass Relationships

v	Velocity	$\frac{m}{s}$
a	Acceleration	$\frac{m}{s^2}$
m		
p	Momentum	$kg\frac{m}{s}$
F	Force	$kg\frac{m}{s^2}$

$kg\ \frac{m^2}{s}\ \frac{1}{s}$

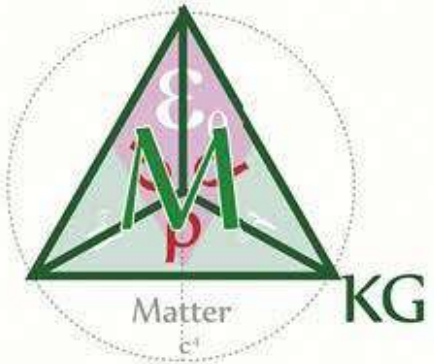
EM mass is revealed to be the scalar property of 2D Energy waveforms that is at the core of many important physical processes and measurements

Ω	Quantum Angular Momentum	$\frac{m^2}{s}$
v^2	Celeritas squared	$\frac{m^2}{s^2}$
m		
h	Planck's Constant	$kg\frac{m^2}{s}$
E	Energy	$kg\frac{m^2}{s^2}$

f	Frequency	$\frac{1}{s}$
T	Period	s
m		
I	Current	$\frac{kg}{s}$
C	Charge	$\frac{s}{kg}$

E/second

E/second²



2D mass geometries should never be confused with 3D Matter topoplogies; nor should the terms be used in exchange for each other

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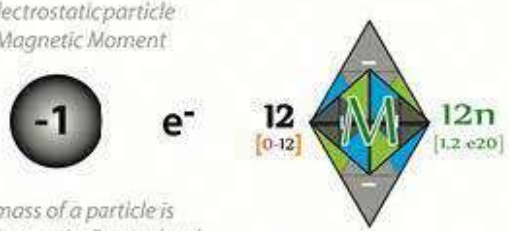
Relativistic mass-Matter

Rest Matter

$$T\pi \left[[\varepsilon_0 \mu_0].[m\Omega v^2] \right]$$
mass-Matter

3D rest mass-Matter topolgy =
closed volume of 2D mass-energies

3D Electrostaticparticle
No Magnetic Moment



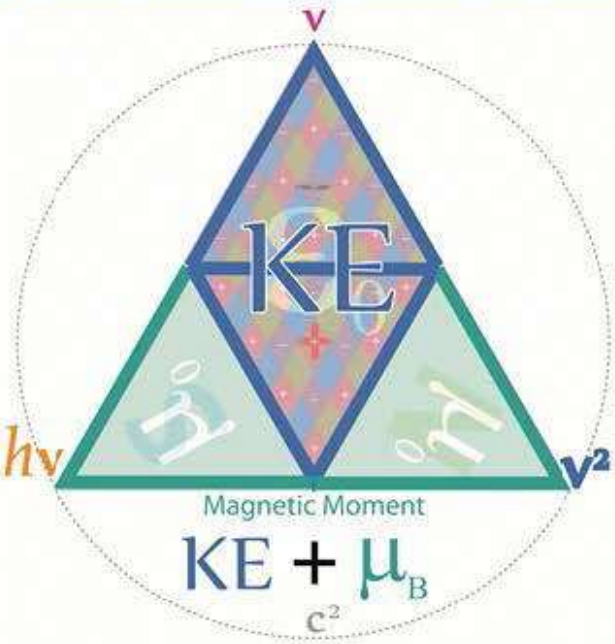
rest mass of a particle is
dependent on its Energy level

**All Matter is a Tetryonic
standing-wave charged geometry
occupying a volume in 3D spherical space**

$$\left[\frac{T\pi}{c^4}\left[[m\Omega v^2]_{\text{mass velocity}} \right]_{\text{Planck quanta}} \right]_{\text{Matter}} \rightarrow \left[\frac{12\pi}{c^4}\left[[m\Omega v^2]_{\text{mass velocity}} \right]_{\text{Planck quanta}} \right]_{\text{Dodecyon}}$$

rest mass-Matter is velocity invariant
(not subject to Lorentz corrections)

The property of Matter cannot be measured using a planar [c squared] spatial co-ordinate system



$$KE + \mu_B$$
$$c^2$$

**A KEM field has Electric and Magnetic quanta
whose total energy quanta is directly related
to the square of the particle's velocity**

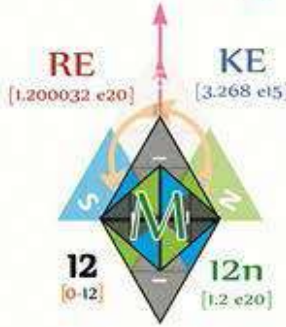
$$4\pi \left[\frac{m\Omega v^2}{c^2} \right]_{\text{mass velocity}}$$

All KEM fields are subject to
Lorentz corrections

Kinetic Energies

$$4n\pi \left[[\varepsilon_0 \mu_0].[m\Omega v^2] \right]$$
KEM field

Matter-Energy



electron KEM model

**Relativistic mass Energy =
rest Matter + Kinetic EM Energies**

Electron rest Matter

$$\left[\frac{12\pi}{c^4}\left[[m\Omega v^2]_{\text{mass velocity}} \right]_{\text{Planck quanta}} \right]_{\text{Lepton}} + \left[\frac{4\pi}{c^2}\left[[m\Omega v^2]_{\text{mass velocity}} \right]_{\text{Planck quanta}} \right]_{\text{KEM wave}}$$

Kinetic Energies

KEM mass-energies are velocity dependent
(subject to Lorentz corrections)

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Tetryonic mass & Matter

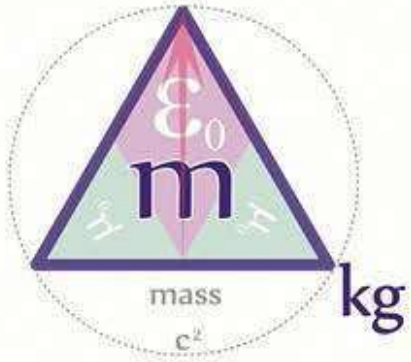
Historically interchanged due to the lack of proper definitions
the physical properties of EM mass & Matter can now be firmly defined
with respect to their energy equivalence and spatial geometries

m

mass is a measure of the 2D planar energy content of any physical system

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

mass — Planck quanta — mass — velocity



EM mass should replace the generic term mass with reference to ElectroMagnetic energy densities

MATTER is a geometric 4nπ standing wave topology of EM mass-energy geometries

The electromagnetic energies of rest Matter is never 'at rest' as the electromagnetic field energies creating mass-Matter topologies alway propagate at c

M

Matter is a measure of the 3D volumetric energy content of any physical system

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Matter — Planck quanta — mass — velocity

E/second

2D
radiant equilateral geometry
of EM mass-ENERGY momenta
EM mass

E/second²

3D
standing-wave topology
of EM mass-ENERGY momenta
rest Matter

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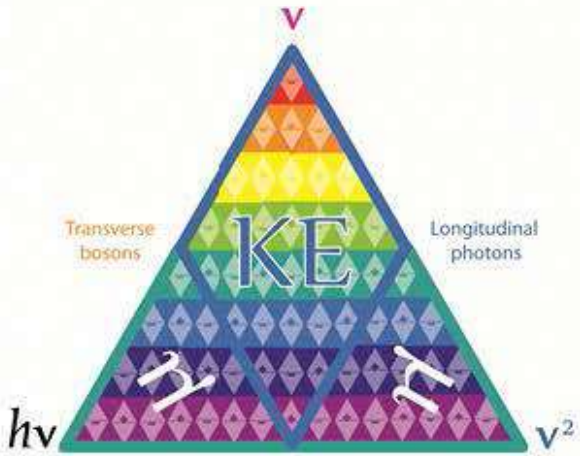
Photoelectron KEM fields

The linear momenta produced as a result of energy momenta in KEM fields is converted into angular momentum when leptons are bound to atomic nuclei



SPIN UP

The EM mass-energy content of Baryons directly influence the KEM field energy levels of bound Leptons

EM mass-energy-momenta

Changes in the momenta of bound Leptons [linear & quantised angular]

prouduces spectral lines of varying frequencies

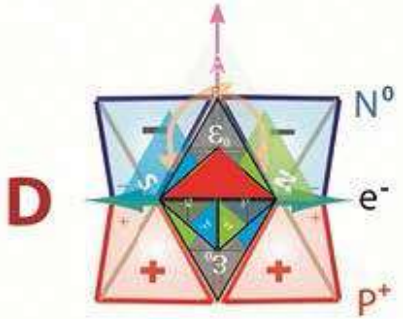
and Spin are always conserved

The motion of leptons within atomic nuclei produces Magnetic moments at various orientations to the nuclear magneton

SPIN DOWN

If an electron is 'ejected' from the Nuclei it will obey conservation of EM mass-energy momentum

ie Its ejected energy-momentum equals the absorbed photon's energy-momenta [minus the work energy required to free it]



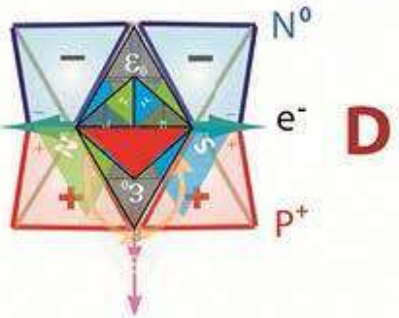
UP spin

Parallel Magnetic Moments

Nuclear magneton

DOWN spin

Antiparallel Magnetic moments



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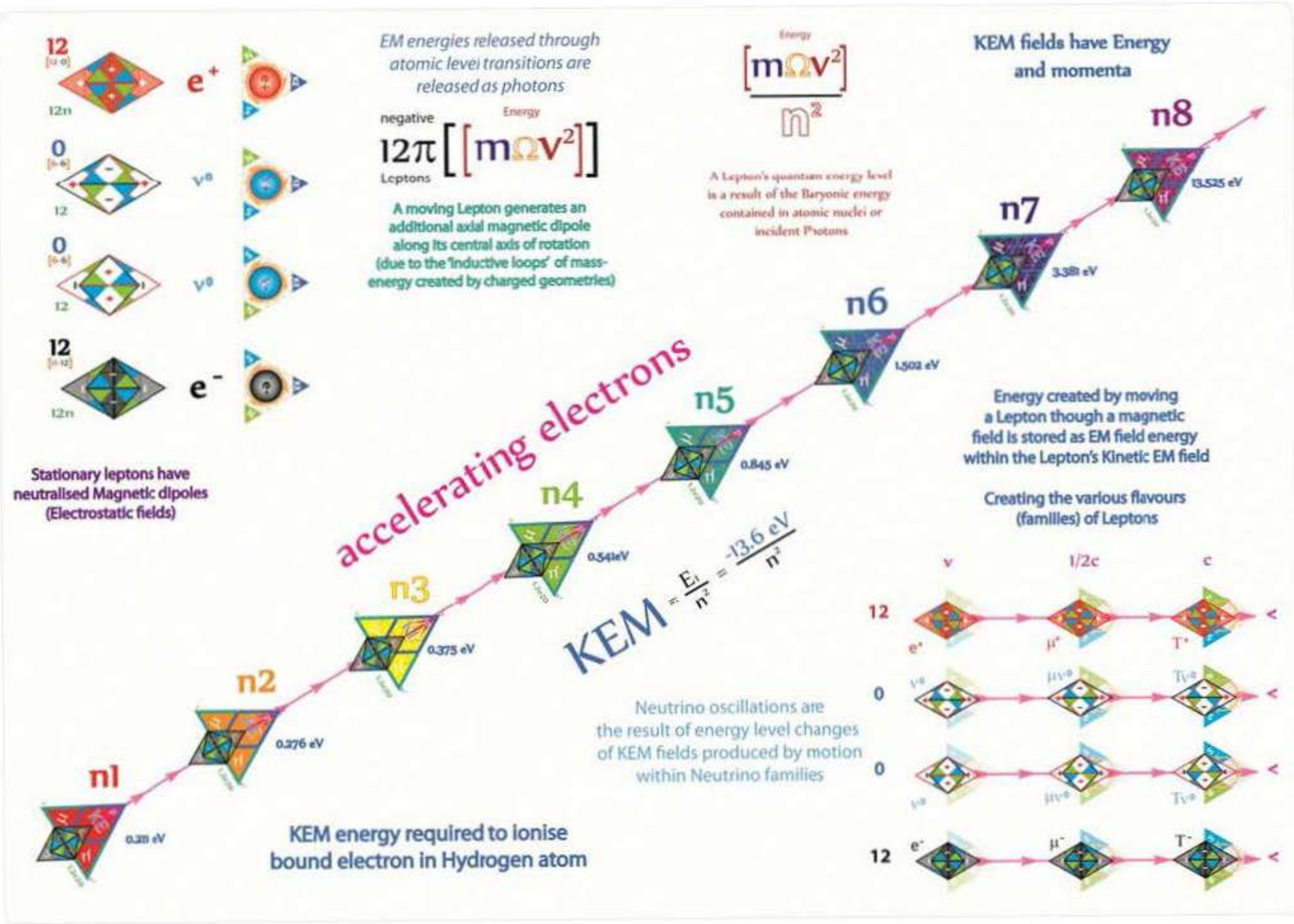

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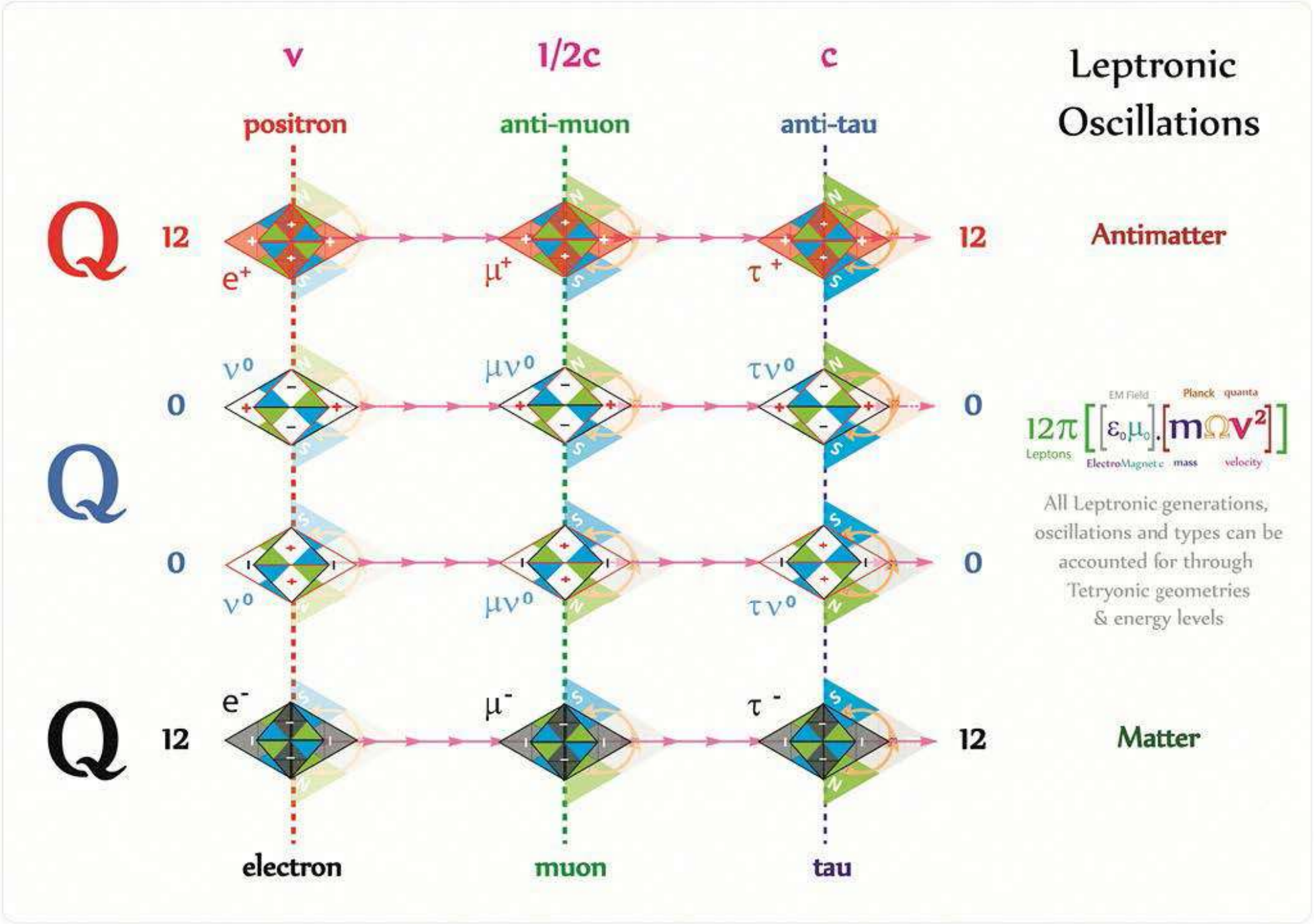

Leptronic Oscillations

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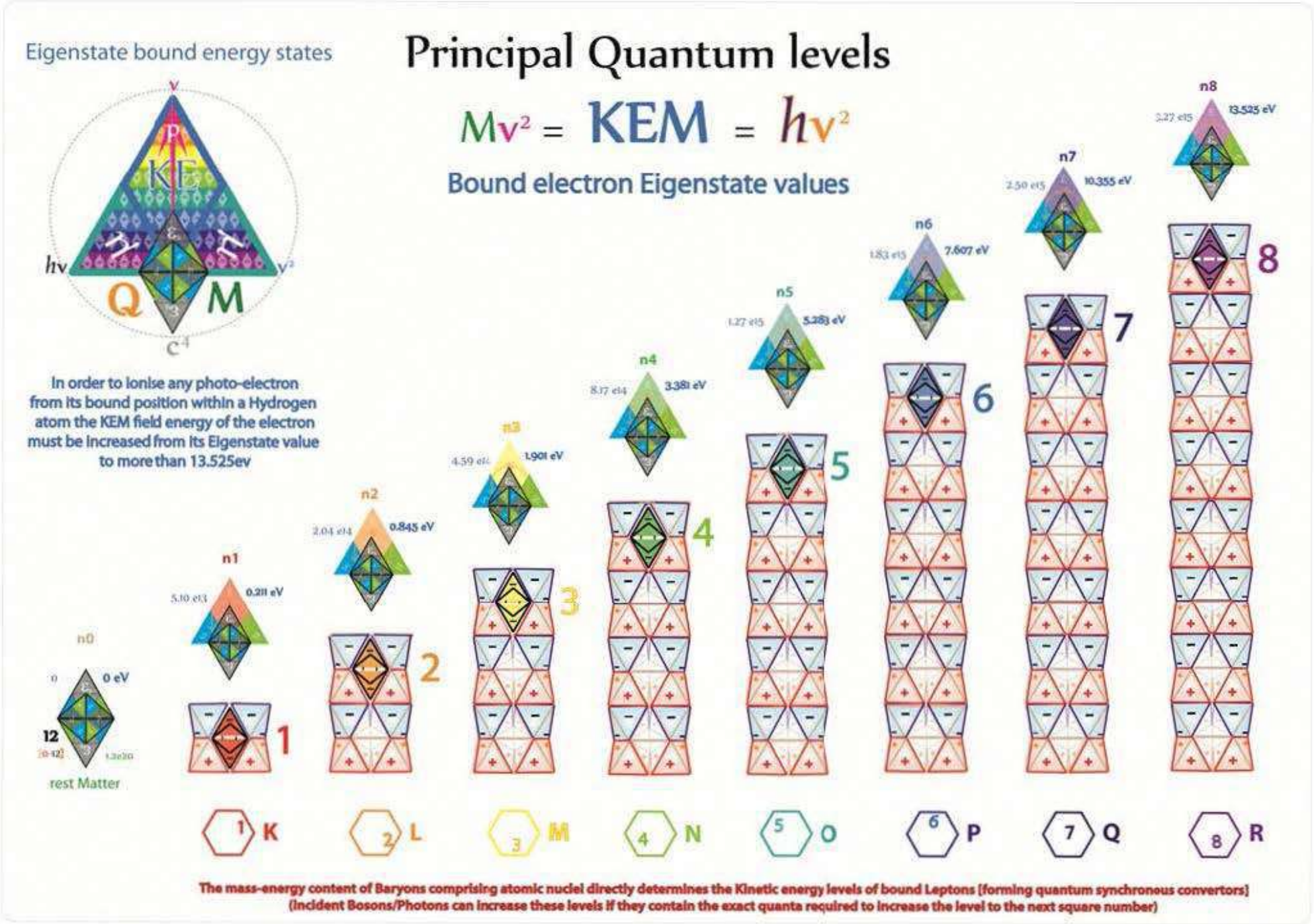

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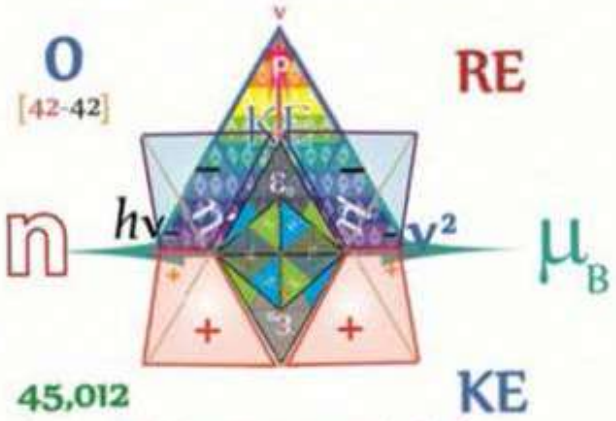
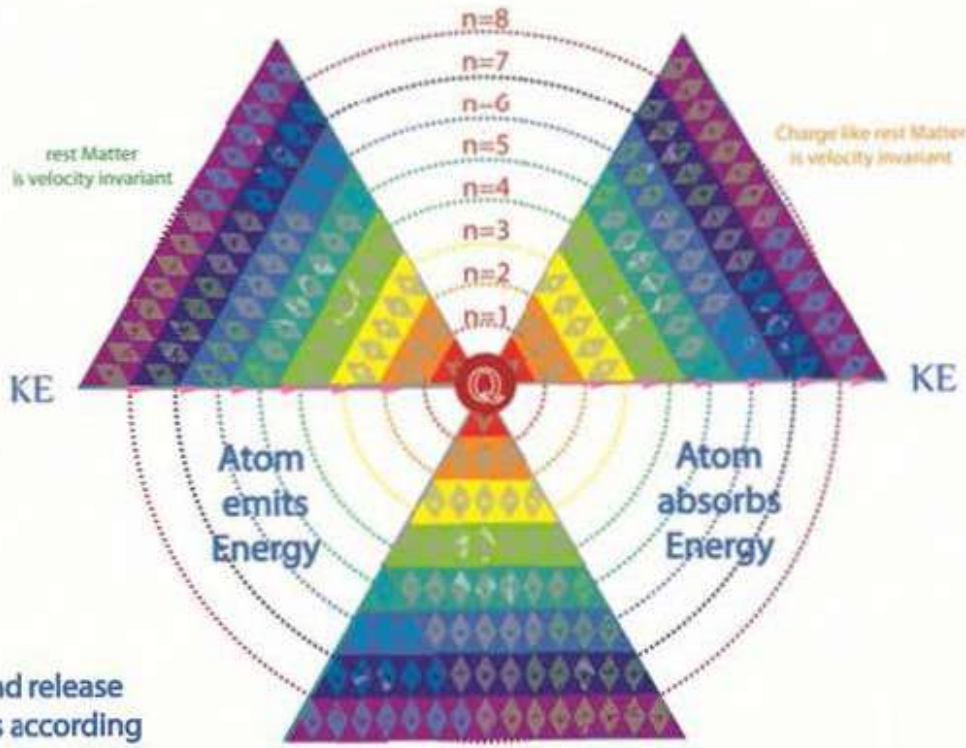
Bohr radius

As the Electron's angular velocity increases the measureable Bohr magnetic moment strength increases and its associated KEM field Planck wavelengths decrease (due to the increased Planck quanta).



The highest quantum number level produces the strongest Magnetic Moment



All massive particles asbsorb and release energy in discrete quantum steps according to their respective Tetryonic geometries and changes in velocities

Kinetic Energies

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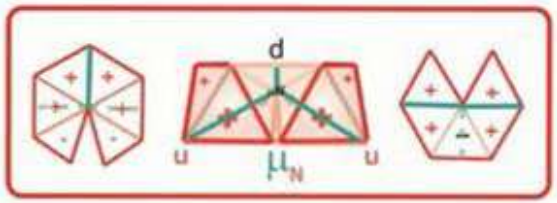
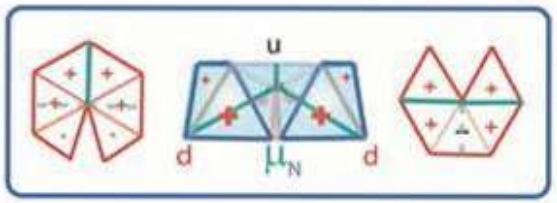
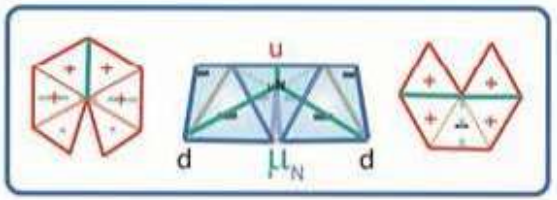
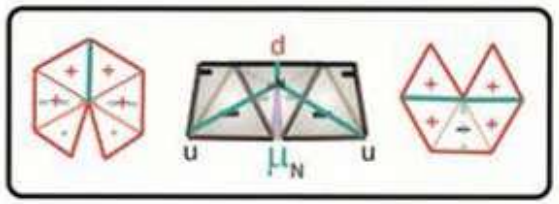
Nuclear Magnetons

are weaker than Bohr magnetons
due to differing mass-charge ratios
and non-parallel Quark magnetons









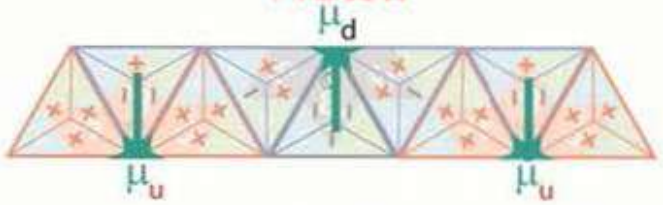
Baryons

are tri-Dodecyon geometries

$$36\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Baryons — EM Field: ElectroMagnetic — Planck quanta: mass, velocity

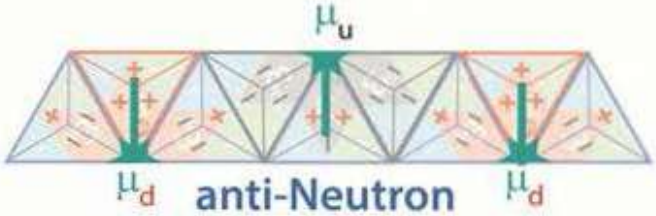
Proton



Tetryonic Charge

P^+ 12 [24-12] Q 36

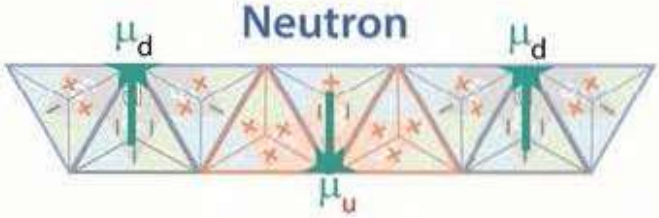
Nuclear magneton



$\overline{N}^0$ 0 [18-18] Q 36

Nuclear magneton

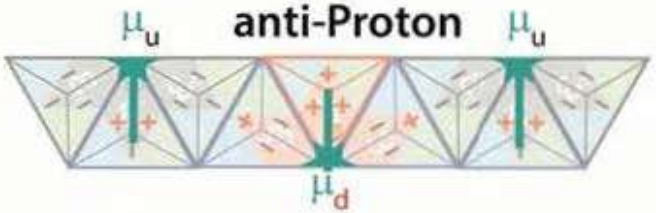
Neutron



N^0 0 [18-18] Q 36

Nuclear magneton

anti-Proton



P^- 12 [12-24] Q 36

Nuclear magneton

Matter geometry

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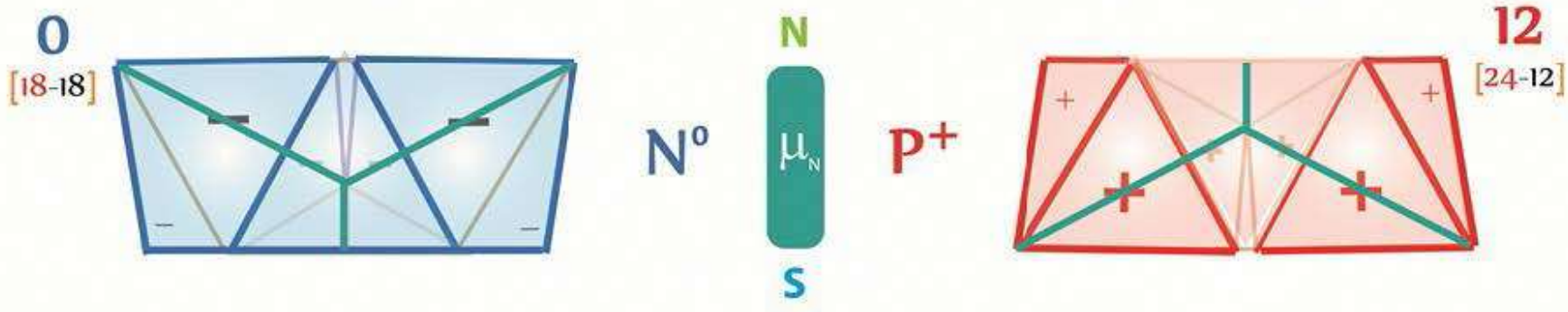
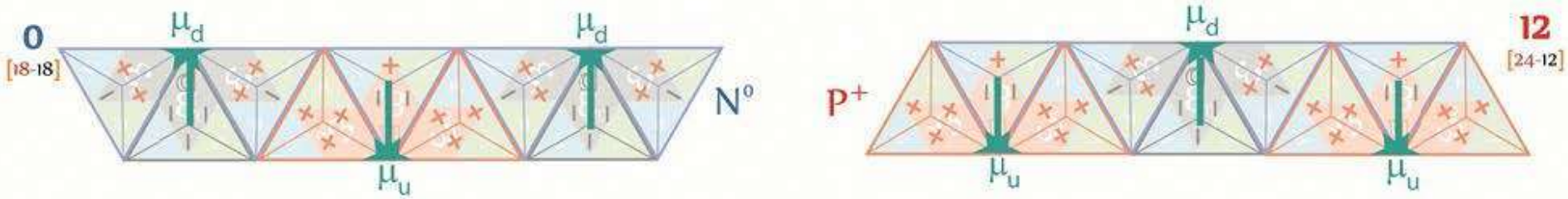
Baryonic Magnetic Moments





As a result of the 3 non-aligned Quark magnetic moments
resulting from their Tetryonic geometry,
the Nuclear Magneton is considerably weaker than the Bohr Magneton

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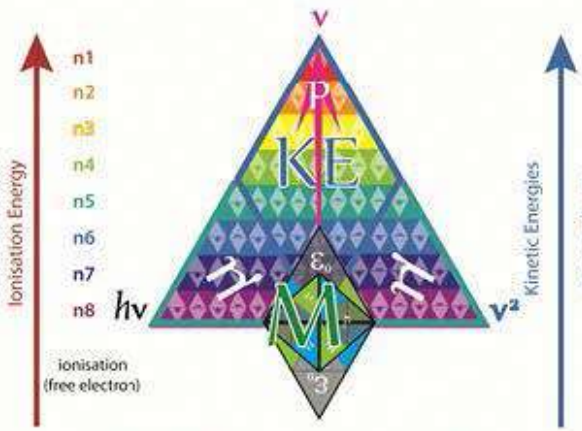
Nuclear Quantum Energies

[Principal Quantum Numbers]

All electron energy levels are reflective of the KEM field of a electron in a specific quantum level (The rest Matter of each electron is invariant)



Higher Quantum Level electrons already have high Kinetic energies and thus require lower frequency photons (low additional KE) in order to be ejected from their bound nuclear positions

-13.6 eV Hydrogen ionisation Energy

An Electron's energy can only increase in steps that reflect the Tetryonic Matter geometry of Leptons and their square mass-energies

Principal Quantum numbers reflect an electron's energy level

Energy may be absorbed or released from any lepton in Quantum steps reflecting the energy difference between the electron 'orbitals'

Energy required to ionise electron with an existing KEM field

n1 0.211 eV 5.10 e13 -13.389 eV rest Matter

n2 0.845 eV 2.04 e14 -12.755 eV

n3 1.901 eV 4.59 e14 -11.699 eV

n4 3.381 eV 8.17 e14 -10.219 eV

n5 5.283 eV 1.27 e15 -8.317 eV

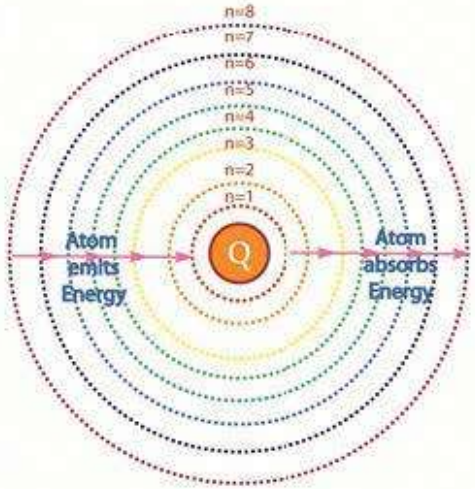
n6 7.607 eV 183 15 -5.993 eV

n7 10.355 eV 2.50 e15 -3.245 eV

n8 13.525 eV 3.27 e15 -0.075 eV

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left[\frac{1}{n_i^2} - \frac{1}{n_f^2}\right]$$

Transitions between electron energy levels is the basis for emission and absorption spectra



$$KEM = \frac{E_1}{n^2} = \frac{-13.525\ eV}{n^2}$$

Eigenstate energy levels

Any electron that has in excess of 13.525 eV of Kinetic Energy has sufficent KE to escape the Nucleus

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Leptons are historically classified as Spin 1/2 particles (by the spin-statistics theorem and the Pauli exclusion principle) as determined by their magnetic moments

Quantum Spin Numbers

(rotations about an axis)

Spin 1/2

720°

Rotating a spin-1/2 particle by 360 degrees does not bring it back to the same quantum state it needs a 720 degree rotation

Planck bar relates to the electric field content of KEM fields resulting from Matter in motion (as reference to the Nuclear magneton or external Magnetic field)

Spin 0

any°

A spin-zero particle can only have a single quantum state, even after torque is applied.

+1 Spherical 'point particles' of charge do not exist -1

Spin 1

360°

Rotating a spin-1 particle 360 degrees can bring it back to the same quantum state

SPIN must not to be confused with Chirality (reflections)

Spin 2

180°

Rotating a spin-2 particle 180 degrees can bring it back to the same quantum state

electro-static field

Photons are their own anti-particle

magneto-static field

electro-static field

Spin 3

120°

Rotating a spin-3 particle 120 degrees can bring it back to the same quantum state

On a geometric basis all Leptons are in fact spin 3 particles

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Magnetic moments are determined by the KEM fields created by vector linear momentum

Nuclear Magnetic moments are complicated by the tri-quark magnetons within all Matter topologies

The KEM field of any charged particle in motion is reflective of the particle's nett charge topology

720°

Rotating a spin-1/2 particle by 360 degrees does not bring it back to the same quantum state it needs a 720 degree rotation

Spin 1/2

μB Parallel μN anti-Parallel μB

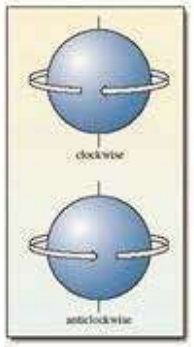
electron spins

μB anti-Parallel μN Parallel μB

120°

Rotating a spin-3 particle 120 degrees can bring it back to the same quantum state

Spin 3



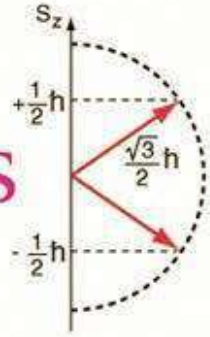
All atomic particles have a particular "spin" analogous to the Earth's rotation on its axis.

$$\mu_B = \left[\frac{Q}{2mv}\right]/\ell$$

An isolated electron has an angular momentum and a magnetic moment resulting from its spin. While an electron's spin is sometimes visualized as a literal rotation about an axis, it is in fact a fundamentally different, quantum-mechanical phenomenon with no true analogue in classical physics.

The quantum mechanical reality underlying spin is complex and still poorly understood Consequently, there is no reason to expect the above classical relation to hold.

$$\mu_B = g\left[\frac{e^-}{2mv}\right]S$$



Tetryonic KEM field geometries reveals the source and orientation of all atomic magnetic moments

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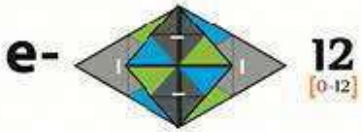
Generating Magnetons

A static Electron has a negative Tetryonic charge [0-12] topology with neutralised magnetic dipoles



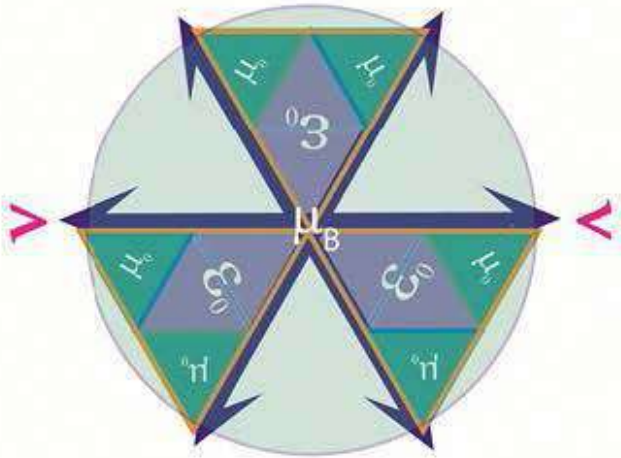
Leptons are
12 loop inductive
charge rotors

Tetryonic geometry
fully explains Leptronic 'spins'

Einstein's Special Relativity model of distorted moving charges producing magnetic moments is incorrect

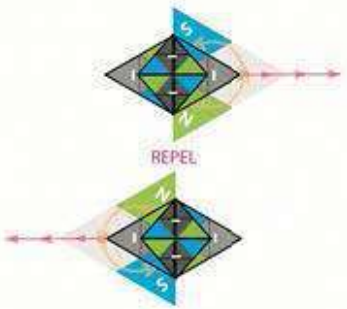
BOHR Magneton produced by Lorentzian distortion of charges due to relativistic velocities

$$\mu_B = \frac{e\hbar}{2m_e}$$



The term "electron spin" can now be taken literally (when modelled with Tetryonic geometries) as an accurate description of the origin of Magnetic moments for all Leptonic [BOHR] magnetons.

The previously held model of the electron as a spinning sphere of charge must be abandoned in favour of the true Tetryonic charge geometries of EM mass-Energy-Matter



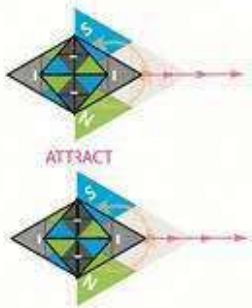
Ampere Force

$$\mathbf{B} = \frac{\mu_0 I}{4\pi} \int \frac{d\boldsymbol{\ell} \times \hat{\mathbf{r}}}{r^2},$$

$$F = 2k_A \frac{I_1 I_2}{r}$$

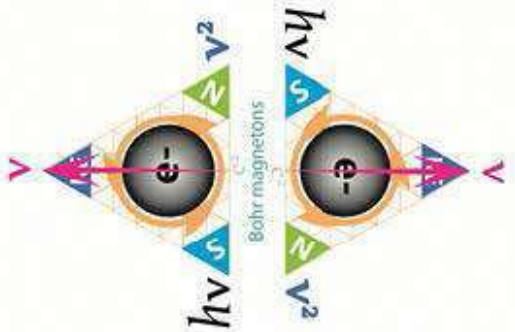
$$\mathbf{F} = q[\mathbf{E} + (\mathbf{v} \times \mathbf{B})].$$

Lorentz Force



A moving Electron has a KEM field with an Electric field and a Magnetic Moment

The gyromagnetic ratio of a particle or system is the ratio of its magnetic dipole moment to its angular momentum



The KEM field energy of an Electron in motion is subject to relativistic corrections due to energy changes resulting from its acceleration

$$\lambda = L'\sqrt{1 - \frac{v^2}{c^2}}$$

WAVE-length contraction
of mass-energy quanta of KEM field

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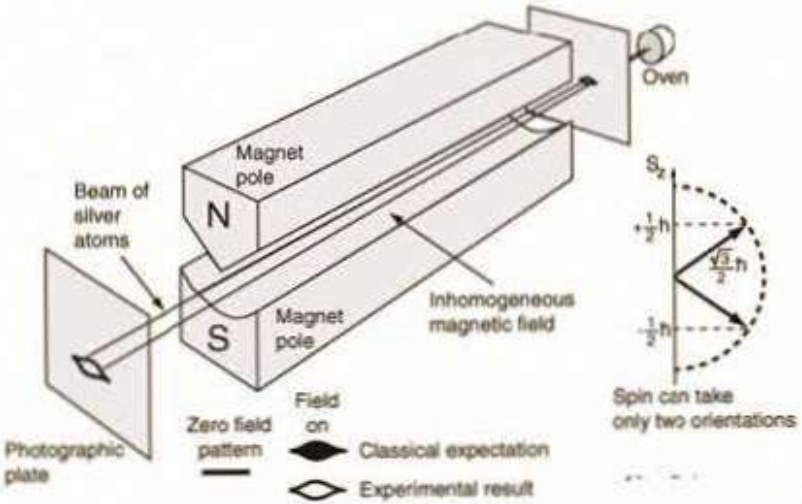
Stern Gerlach Experiment

In 1922 O. Stern and W. Gerlach measured the intrinsic spin angular momentum of silver atoms and found it to take only two discrete values, + h /2 and - h / 2 commonly called "spin up" and "spin down



The Stern-Gerlach experiment to determine electron SPIN

The results were interpreted to show that particles possess an intrinsic angular momentum that is most closely analogous to the angular momentum of a classically spinning charged sphere, that takes on only certain quantized values of angular momentum

Tetryonics shows the results are a product of the KEM field produced by charge particles in motion, with all charged particles being able to produce 2 distinct magneton orientations as a result of the real motion of their intrinsic quantum inductive loop (Matter)geometries through external E fields & as referenced to external M moments.

This along with the Lorentz force produced by an external Magnetic field acting on the KEM magnetons produces the two results obtained

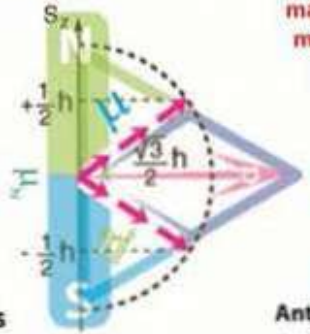
Any increase in electron energies results in an increase in quantised angular momenta and its vector linear momentum

Any change in the KEM energy level of an electron results in Photon emission or absorption

Electron Spins based on the measured Bohr Magnetons of moving electrons are reflected with KEM field geometries

Electrons bound in atomic nuclei increase of decrease their energy levels dependent on the energy level of the nuclei in which they are bound

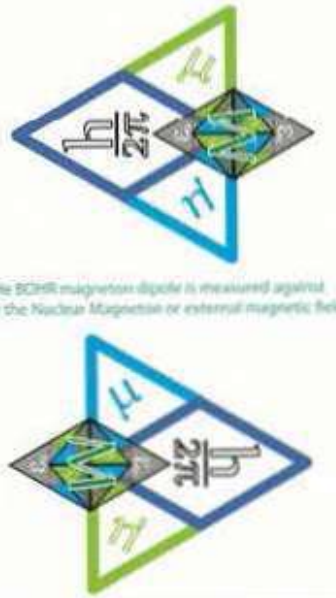
Bound and unbound electrons can rotate in one of two directions influenced only by external magnetic and electric fields or incident Photons



N
Parallel magnetic moment
S

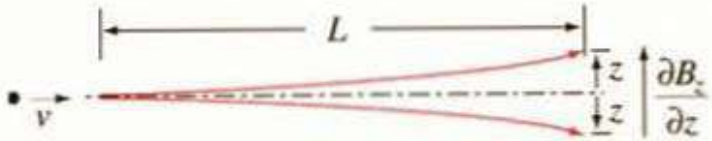
μ_B

S
Antiparallel magnetic moment
N



The BOHR magneton dipole is measured against either the Nuclear Magneton or external magnetic fields

The two separated beams of electrons produced are defined as having differing SPINS [UP or DOWN]



$$z = \frac{1}{2}at^2 = \frac{1}{2}\frac{F}{m}\left[\frac{L}{v}\right]^2 = \pm\frac{\mu_B L^2}{4KE}\frac{\partial B_z}{\partial z}$$

The orientation of the BOHR magneton wrt the NUCLEAR magneton determines the 'direction' of electron SPIN

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Bohr Magnetons

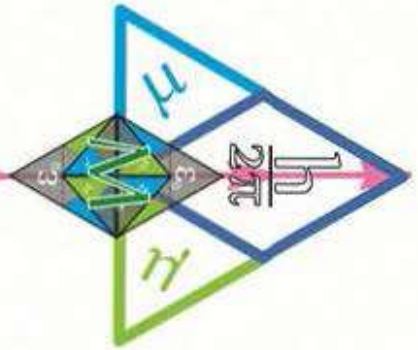
A moving electron is a 12 loop rotating inductor

A moving Lepton creates a secondary stronger intrinsic magnetic dipole moment within its KEM field which interacts with external magnetic fields

Electro-static particles have neutralised Magnetic moments

Velocity
creates
Kinetic Energy
and
Magnetic moments

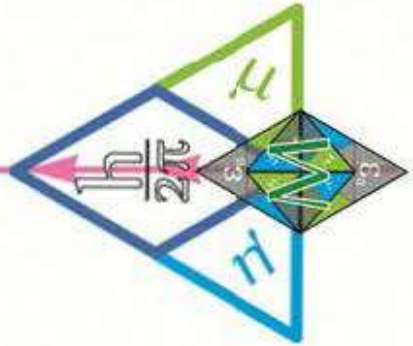
Energy created by moving a Lepton though an external EM field is stored as Planck quanta within the Lepton's extended KEM field



Reversing the vector direction of the particle's linear momentum creates a reversed dipole Magnetic moment

Leptons are not point particles

Left handed and right handed fermions are mirror images of each other



All Leptronic macro-KEM fields and interactions with external fields can be modelled using Tetryonic geometries

Leptronic 'spin' is always determined by the Leptronic Magnetic moment as referenced against the Nuclear Magnetic Moment

Magnetic moment 'spin orientations' are reversed for opposite charge particles

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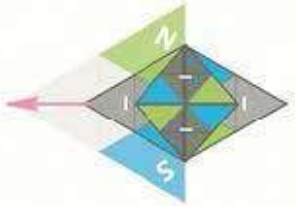
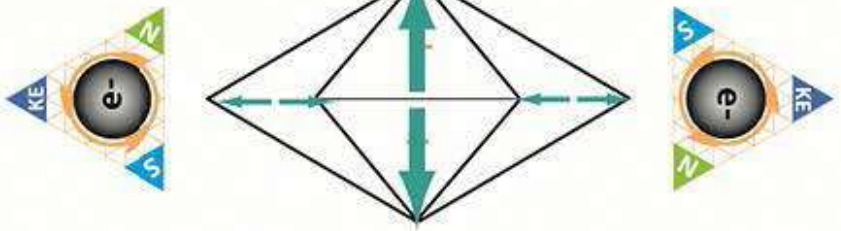
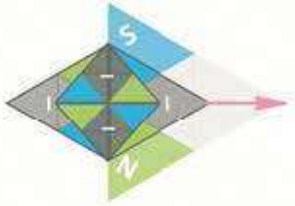
Electron Spin orientation

The Bohr magneton dipole produced by Kinetic Energies
is located axially about the centre of rotation







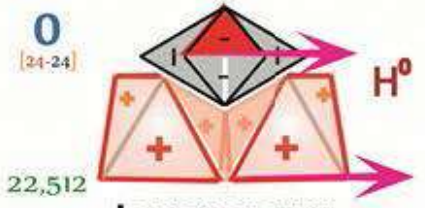
Spin UP

Higher energy

Parallel spin

All Leptons have 12 intrinsic neutralised dipole moments
and a polarised KEM field Magnetic moment
created by the energies of its motion

Spin DOWN



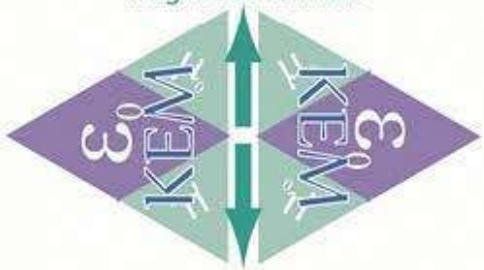
Lower energy

Anti-parallel spin

Spin UP

Magnetic field is Parallel to
Nuclear Magnetic moment
or external Magentic H field

Lepton
Magnetic moment



[Bohr Magneton]

$$\mu_B = \frac{e\hbar}{2m_e}$$

Spin DOWN

Magnetic field is Antiparallel to
Nuclear Magnetic moment
or external Magnetic H field

Nuclear magnetons
are weaker than
Bohr magnetons

All Leptronic spin directions are referenced to external Magnetic fields [either Nuclear Magnetons or H fields]

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Nuclear Spins

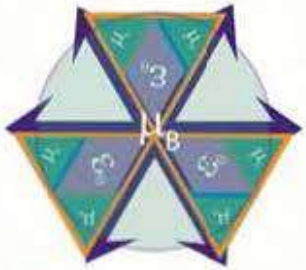
are determined by the orientation of Bohr Magneton
with respect to the Nuclear Magneton
[or an external Magnetic field]

electron Matter geoemtries are negative charged fascia which create neutral intrinsic magnetic dipole configurations

MAGNETIC MOMENT

In a moving electron Kinetic energy produces an axial Magnetic moment

In a static electron all intrinsic dipoes are neutralised through their orientations



Quantum Inductive Loops in motion produce Kinetic Energies in turn creating Magnetic Moments

Electron

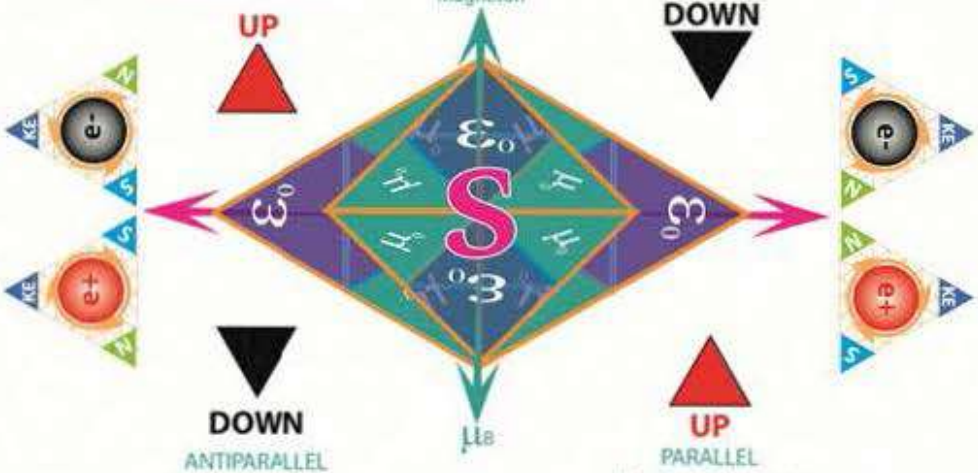
PARALLEL
Magnetic moments

UP

BOHR
Magneton

ANTIPARALLEL
Magnetic moments

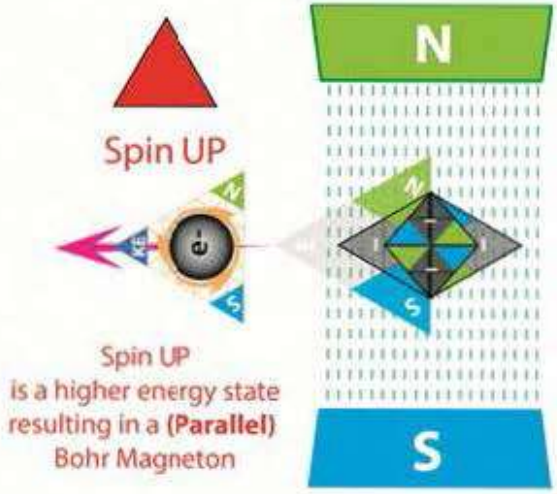
DOWN



DOWN
ANTIPARALLEL
Magnetic moments

UP
PARALLEL
Magnetic moments

Positron



Spin UP

Spin UP
is a higher energy state
resulting in a **(Parallel)**
Bohr Magneton

Spin DOWN
is a lower energy state
resulting in a **(antiParallel)**
Bohr Magneton

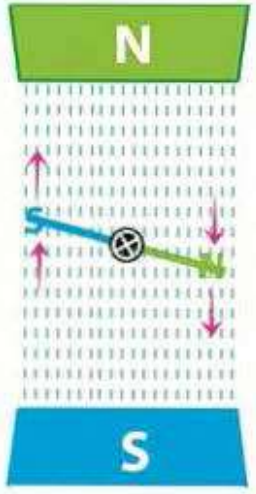
Spin DOWN

Lorentz Force

When moving in an external magnetic field

The axial dipole moment of an electron will experience torque force proportional to its velocity

Opposites attract
Similars repel



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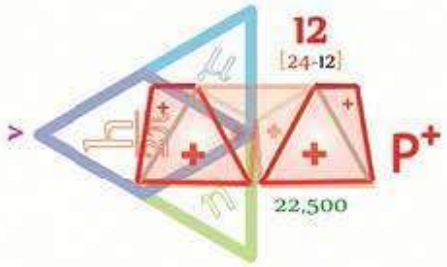
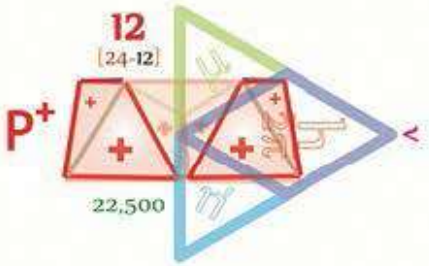
Nuclear magnetic Moment

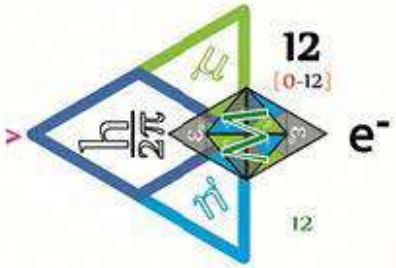
[Nuclear magneton]



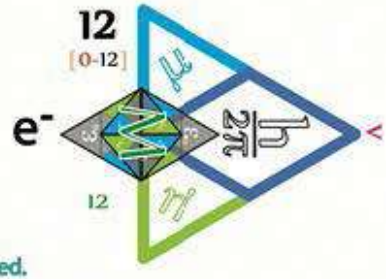
NUCLEAR magnetons are much weaker than BOHR magnetons due to the higher charge to mass ratio of electrons

$$\frac{M_p}{M_e} = \frac{1}{1875}$$

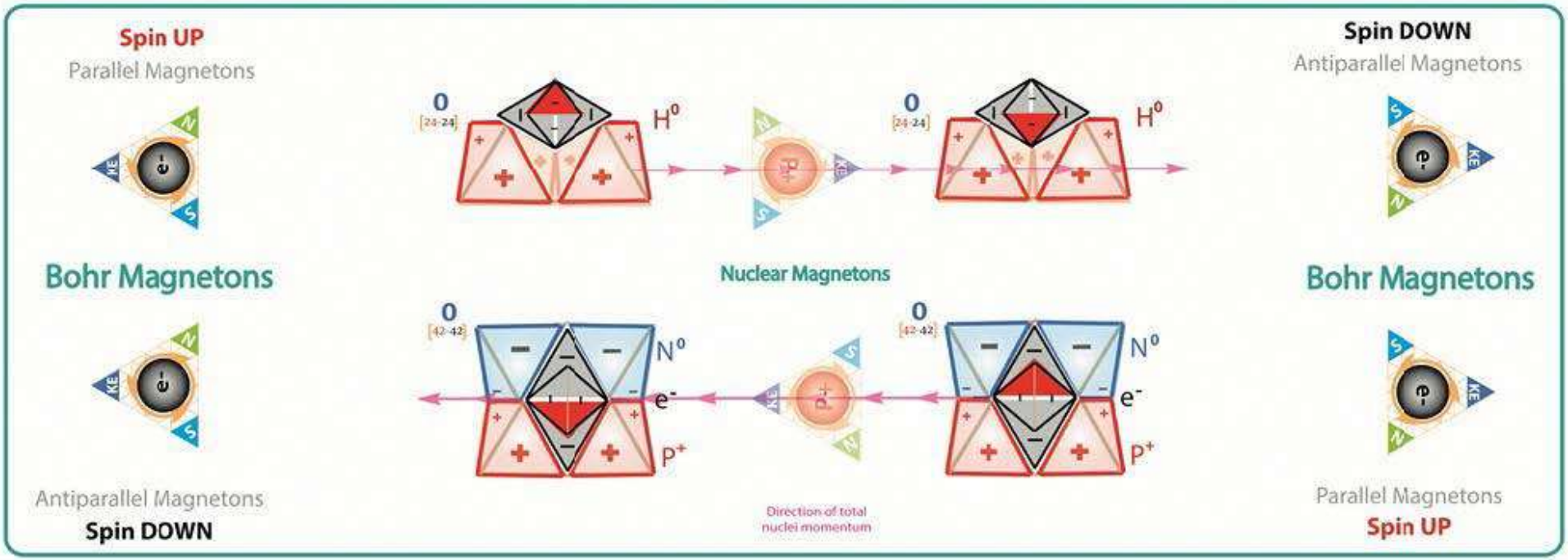




The nuclear spins for individual protons and neutrons parallels the treatment of electron spin, with spin 1/2 and an associated magnetic moment.



For the combination of electron, neutrons and protons in periodic elements, the situation is even more complicated.



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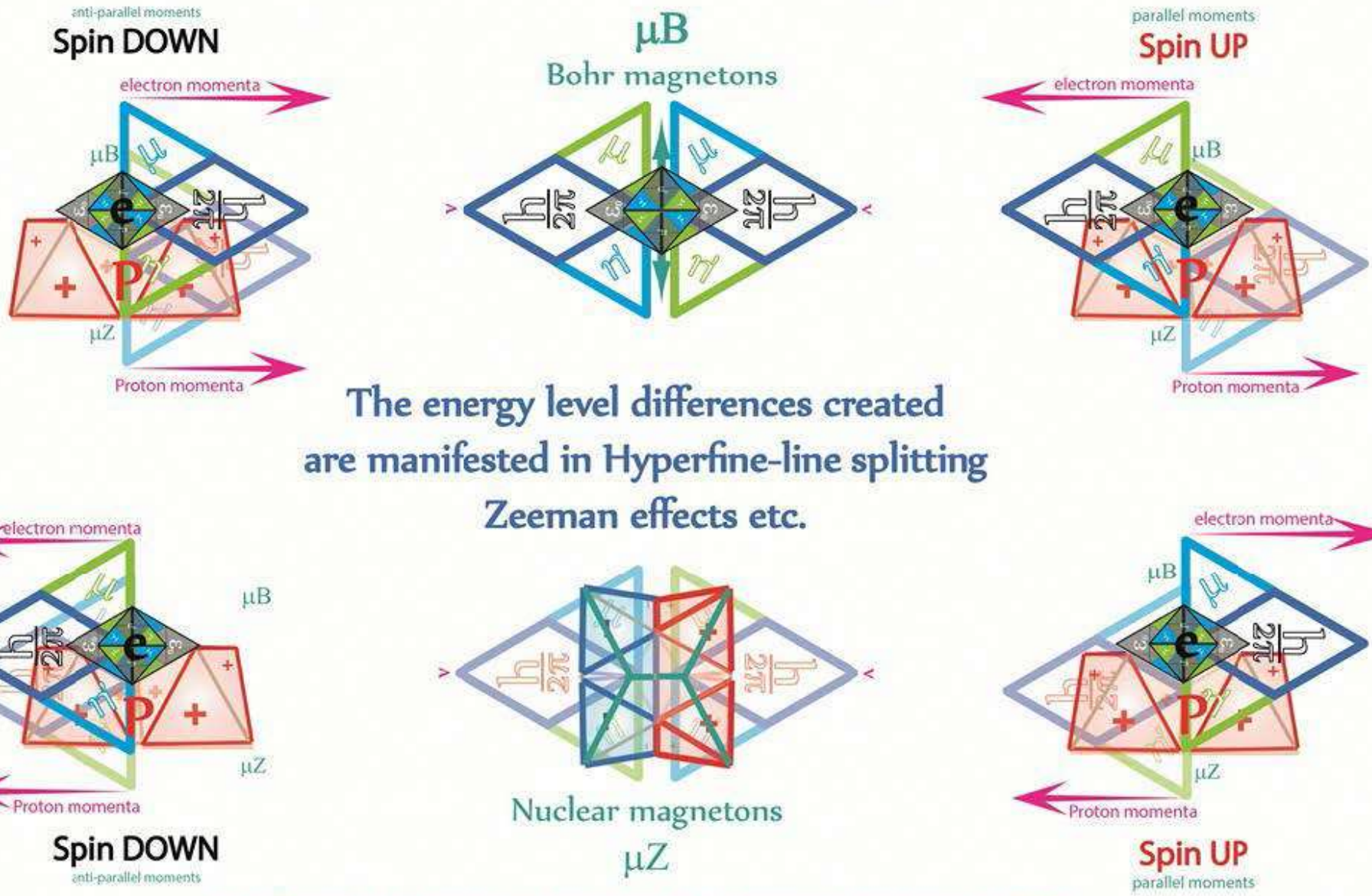
Spin orbital coupling mechanics

The induced magnetic moment of electrons in atomic nuclei combine vectorally with the magnetic moment of the nuclei



The alignment of electron spins in nuclei results in diamagnetic, para-magnetic Matter

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Gyromagnetic Ratio

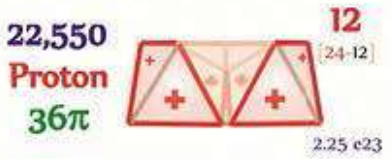
The electron is a 12 charge quantum rotor with a uniform charge to mass density ratio, the ratio of its magnetic moment to its orbital angular momentum, also known as gyromagnetic ratio

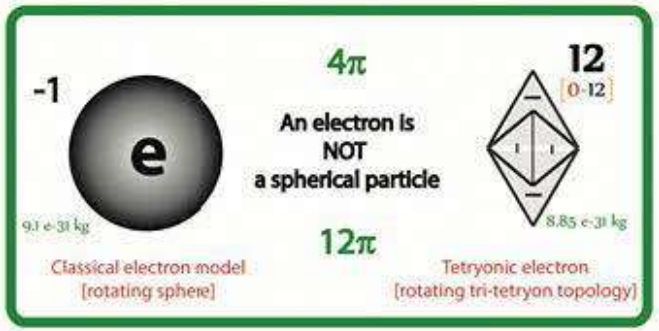
This implies that a more massive assembly of charges spinning with the same angular momentum will have a proportionately weaker magnetic moment, compared to its lighter counterpart.

The Bohr Magneton is determined by the charged KEM field geometry of Leptons

1875
charged mass-Matter differential

The combined Kinetic energy of Motion [KEM field] and Electron Spin coupling with Nuclear Magnetons will effect any measured Gyromagnetic ratios





In physics, the gyromagnetic ratio (also sometimes known as the magnetogyric ratio in other disciplines) of a particle or system is the ratio of its magnetic dipole moment to its angular momentum, and it is often denoted by the symbol γ, gamma.

An isolated electron has an angular momentum and a magnetic moment resulting from its spin.

Its SI units are radian per second per tesla (s−1·T −1) or, equivalently, coulomb per kilogram (C·kg−1).

Tetryonic quantum mass to Charge ratio

$$1.810109642 \times 10^{11}$$

The 2006 CODATA
– e / me = -1.758 820 150(44) x 10[11]

Nuclear Magnetons

e- Tetryonic elementary charge 1.602216081 e-19 coulombs / Tetryonic electron mass 8.851486361 e-31 = em

12q / 1.2 e20

[q/m]

181,010,964,200 C/kg

Spin UP ← K.E.

Electron Spin [Orbital Angular Momentum]

Spin DOWN → K.E.

N

Nuclear Magneton

S

12q / 2.25 e23

Tetryonic elementary charge 1.602216081 e-19 coulombs / Tetryonic Proton mass 1.659653693 e-27 = Pm e+

[q/m]

96,539,180.9 C/kg

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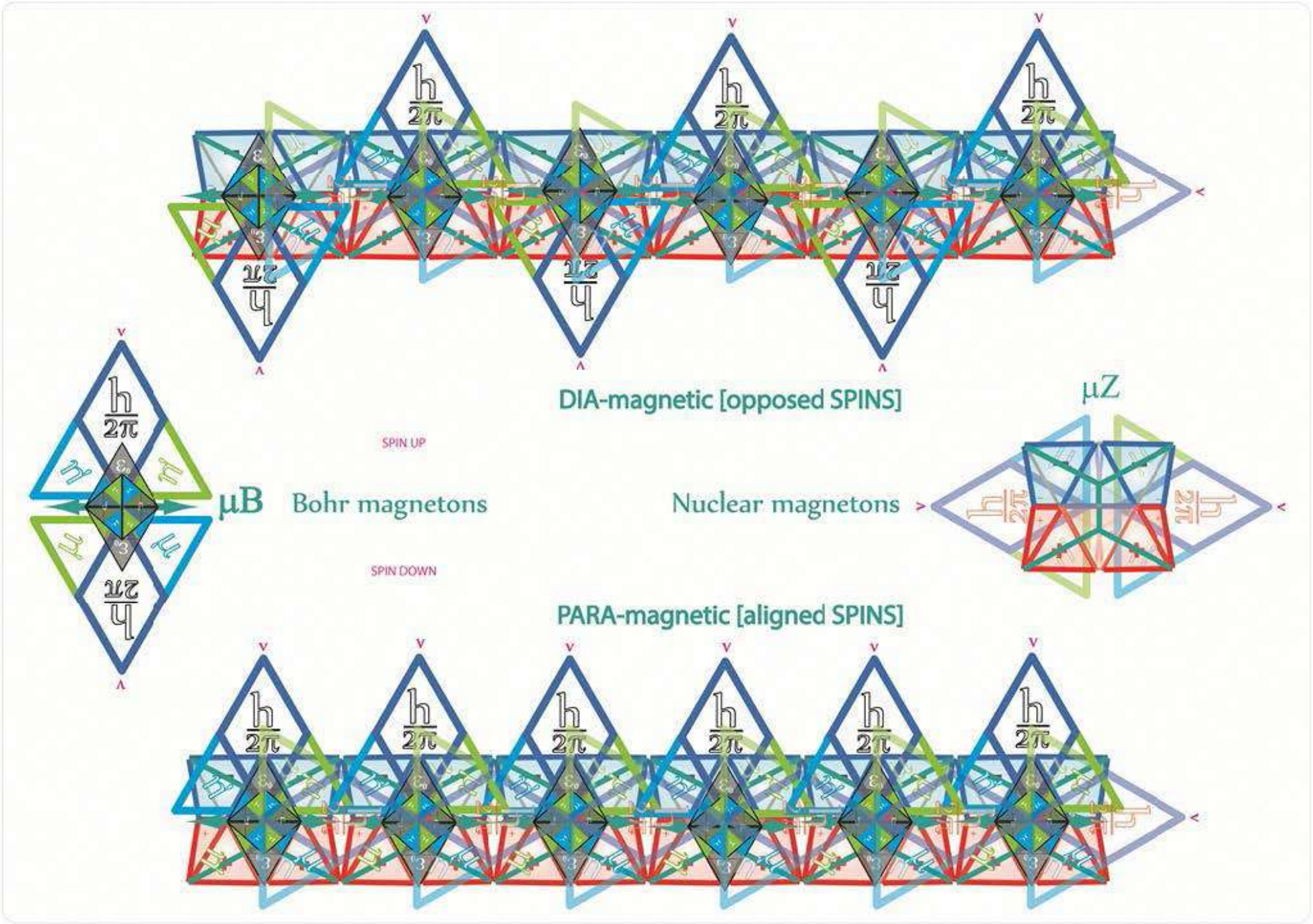

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12
[12-0]

e^+ Positron

1.2e20

Leptons

181,010,964,200 C/kg

12
[0-12]

e^- Electron

1.2e20

12
[24-12]

P^+ Proton

2.25e23

Baryons

96,539,180.9 C/kg

0
[18-18]

N^0 Neutron

2.25e23

All mass-Matter have distinct charge geometries and once in motion are subject to EM forces as a result of their geometries & KEM field

Lorentz force Law

$$\vec{F} = q\vec{E} + q\vec{v} \times \vec{B}$$

LORENTZ force — Electric force — charge velocity — Magnetic force

all Matter in motion is subject to NEWTON'S SECOND LAW OF MOTION

$$F = ma$$

Combining Lorentz's force law & Newton's Third Law we obtain a EM mass-charge quotient for any particle of mass-Matter in motion

$$(M/Q)a = E + v \times B$$

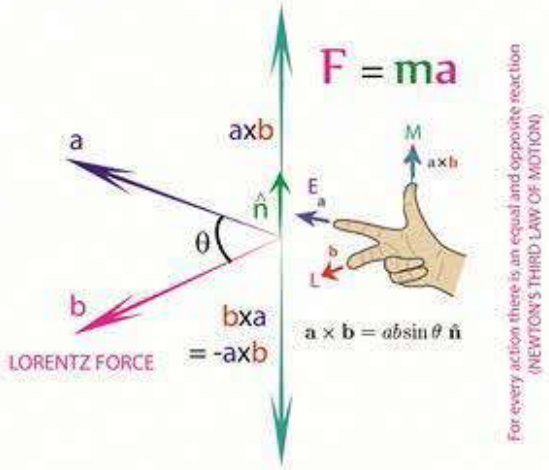
mass-charge ratios

1.335180067 e-20 C

1.810109642 e11 $\left[\frac{q}{m}\right]n$ 1e19 V

7.376238634 e-51 kg

are the basis for mass spectroscopy



Q *Any two particles with the same EM mass-to-charge ratio follow the same path in a vacuum when subjected to the same external electric field* **M**

Dependent on their generations

Charge/mass

$\left(\frac{q_t}{m_t}\right)$ 181,010,964,200 C/kg $\left(\frac{q_e}{m_e}\right)$

4:4 12:12

Tetryons and Leptons can have identical mass-charge ratios

96,487,720.78 C/kg

Elements

48,256,721.99 C/kg

0
[24-24]

Hydrogen

2.2512e23

Deuterium

0
[42-42]

4.5012e23

Tetryonic theory shows mass-charge ratios are a measure of mass-energy geometries in Matter topologies

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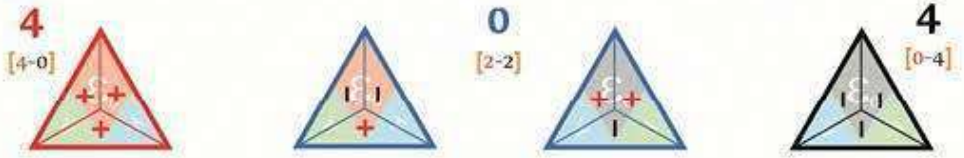
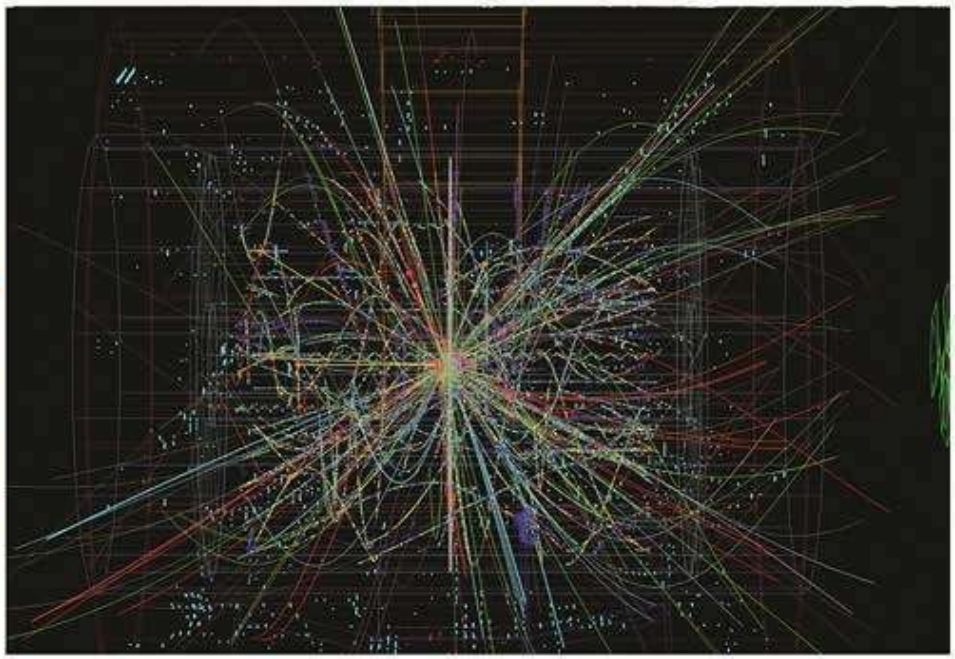
Collider particle track physics

A collider is a type of a particle accelerator involving directed beams of particles.



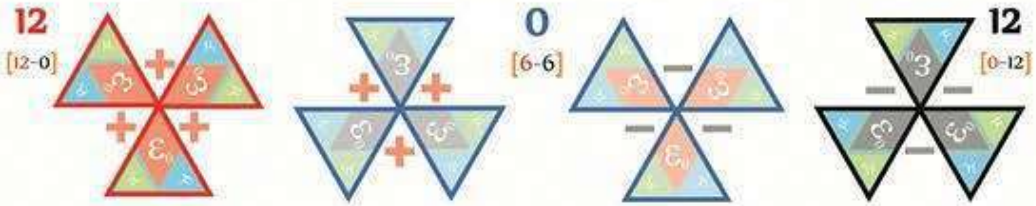
Colliders may either be ring accelerators or linear accelerators,
and may collide a single beam of elementary particles against a stationary target or two beams head-on.



2D bosons & photons are radiant mass-enery geometries

3D Matter Fermions are standing wave mass-energy topologies

Analysis of the by-products of these collisions without a clear definition of, and distinction between, EM mass-energy geometries & Matter topologies through the charged geometrics of Tetryonics ceates a misleading and erroneous picture of the particles created in high energy collisions within particle physics accelerator experiments



E

t 4 [0-4]

4 [4-0] t

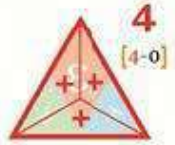
Tetryons have the same 1/3 elementary charge as some Quarks

d 4 [4-8]

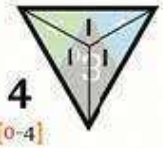
4 [8-4] d

m

Q



181,010,964,200 C/Kg



Tetryons can have the same mass-charge ratios as Leptons

181,010,964,200 C/Kg

M

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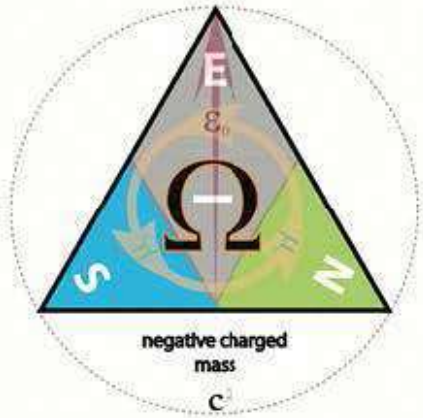
Radiant EM mass-energy geometries



mass Planck quanta

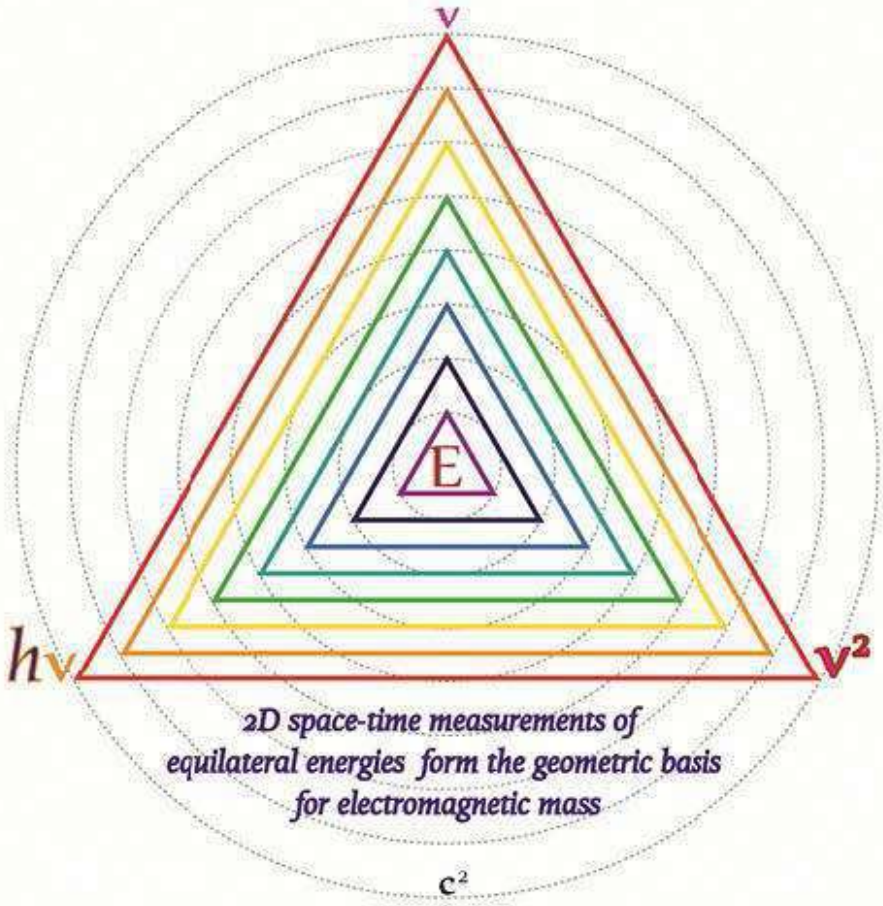
$$\frac{n\pi}{c^2}\left[\left[m_{mass}\Omega v^2_{velocity}\right]\right]$$

Charge

$$\frac{1\pi}{c^2}\left[\left[m_{mass}\Omega v^2_{velocity}\right]\right]$$

Bosons

$$\frac{ODD\,\pi}{c^2}\left[\left[m_{mass}\Omega v^2_{velocity}\right]\right]$$



Photons

$$\frac{2\pi}{c^2}\left[\left[m_{mass}\Omega v^2_{velocity}\right]\right]$$

EM waves

$$\frac{EVEN\,\pi}{c^2}\left[\left[m_{mass}\Omega v^2_{velocity}\right]\right]$$

2D space-time measurements of equilateral energies form the geometric basis for electromagnetic mass

2D Planar divergent EM mass-energies form radiant Electromagnetic waves

ElectroMagnetic mass is a property of Matter
[being the energy content of its charged geometry per unit time]

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ENERGY

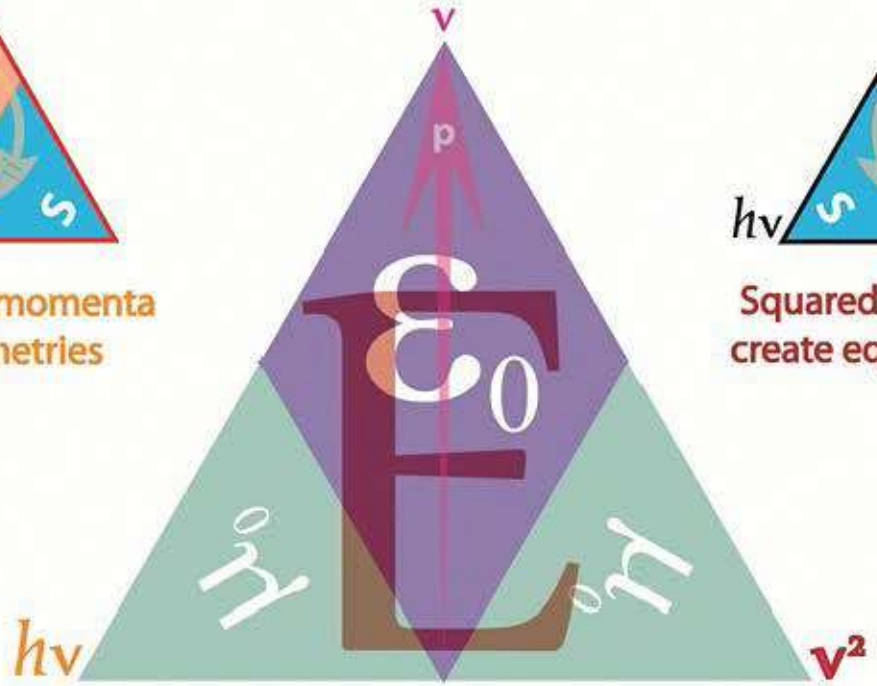
Q charge

E energy

2D Equilateral scalar energy-momenta

Quantised angular momenta are energy geometries

Squared numbers in physics create equilateral geometries



Planck's constant of mass-energy momenta is the source of all physical constants and force relationships

Separated fields of charge create electromotive forces accelerating Material bodies within them

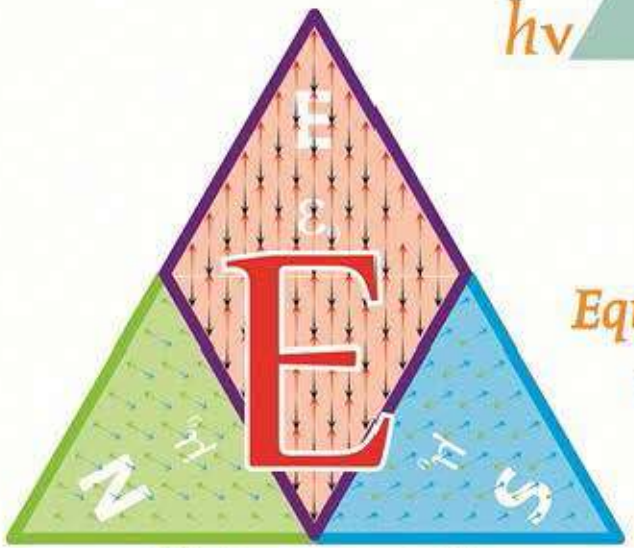
ENERGY Planck quanta

$$n\pi\left[\left[m\Omega v^2\right]\right]$$

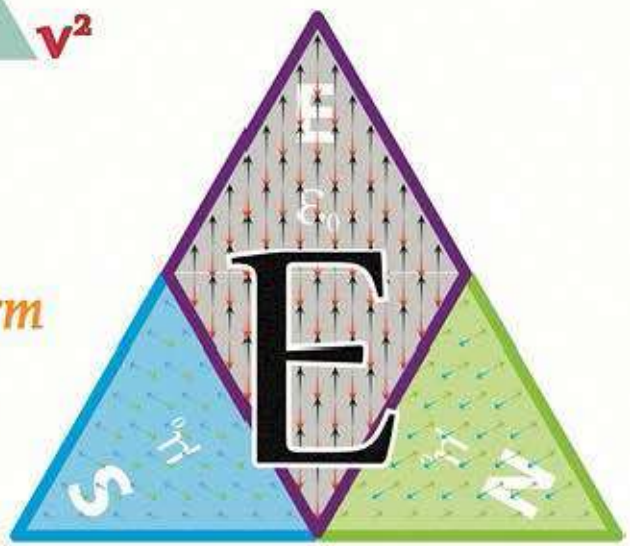
mass velocity

Equilateral energy-momenta form the foundation of all Forces, EM masses & Matter

All energy seeks equilibrium



Positive charge energy momenta fields



Negative charge energy momenta fields

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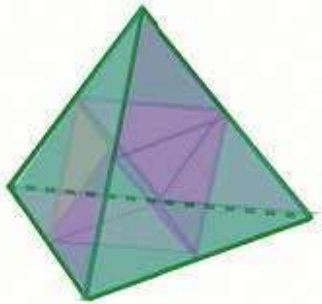
3D Matter topology is NOT a property of 2D ElectroMagnetic mass-energies

it is a measure of the closed 3D standing-wave spatial topology of all fermionic particles created by their charged equilateral mass-energy momenta geometries

Matter displaces vacuum energies to create convergent gravity fields around it

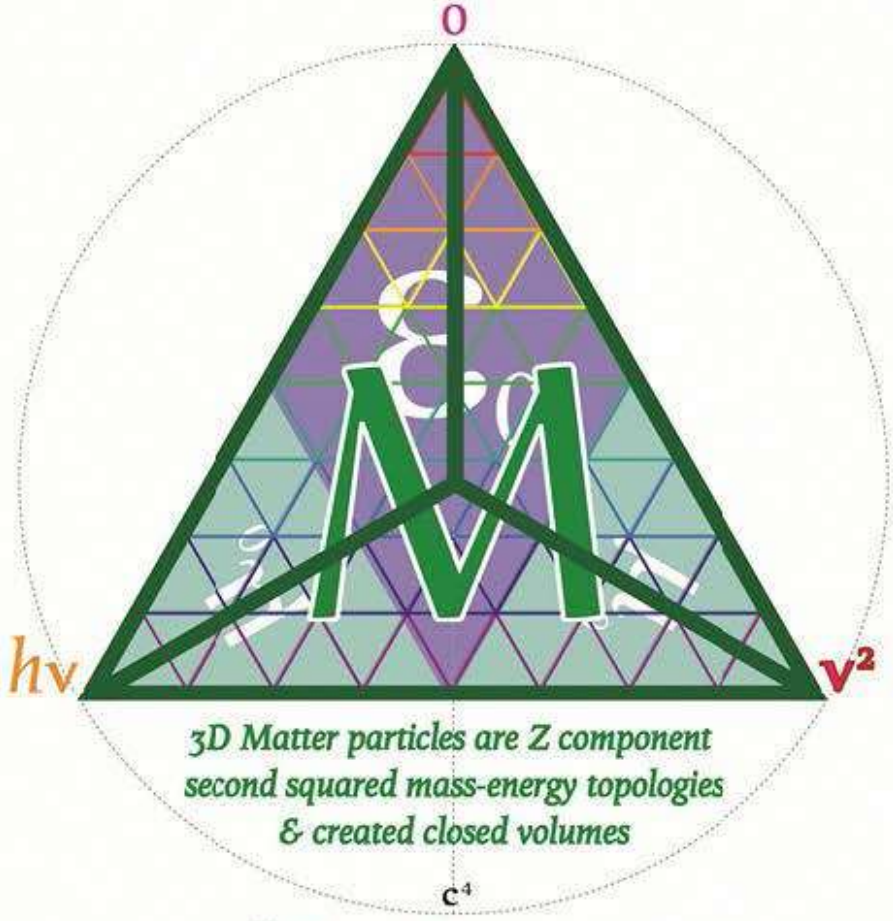


Tetryons are the quantum of Matter

Tetryons $\frac{4\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

Fermions $\frac{12\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

Mesons $\frac{24\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

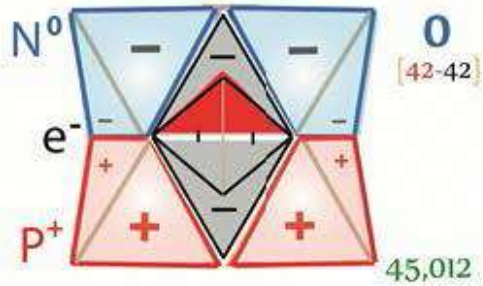


3D Matter particles are Z component second squared mass-energy topologies & created closed volumes

Matter $\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

The mass-energies of Matter are Lorentz invariant to velocity changes

All Matter is comprised of [and radiates divergent] kEM mass-energies



Deuterium is the quantum of all Elements

Baryons $\frac{36\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

Nuclei $\frac{72\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

Deuterons $\frac{84\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$ (Planck quanta; mass, velocity)

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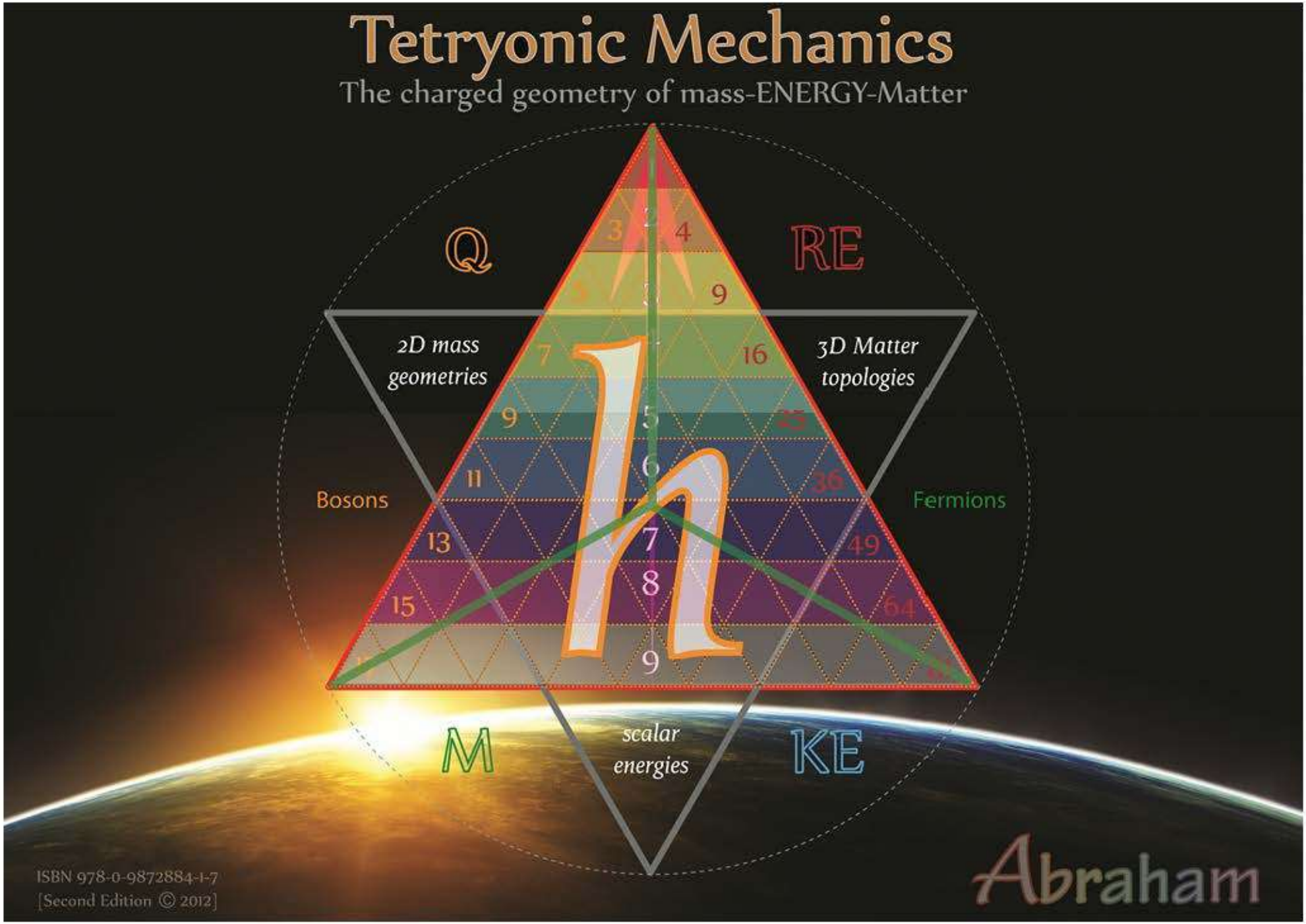

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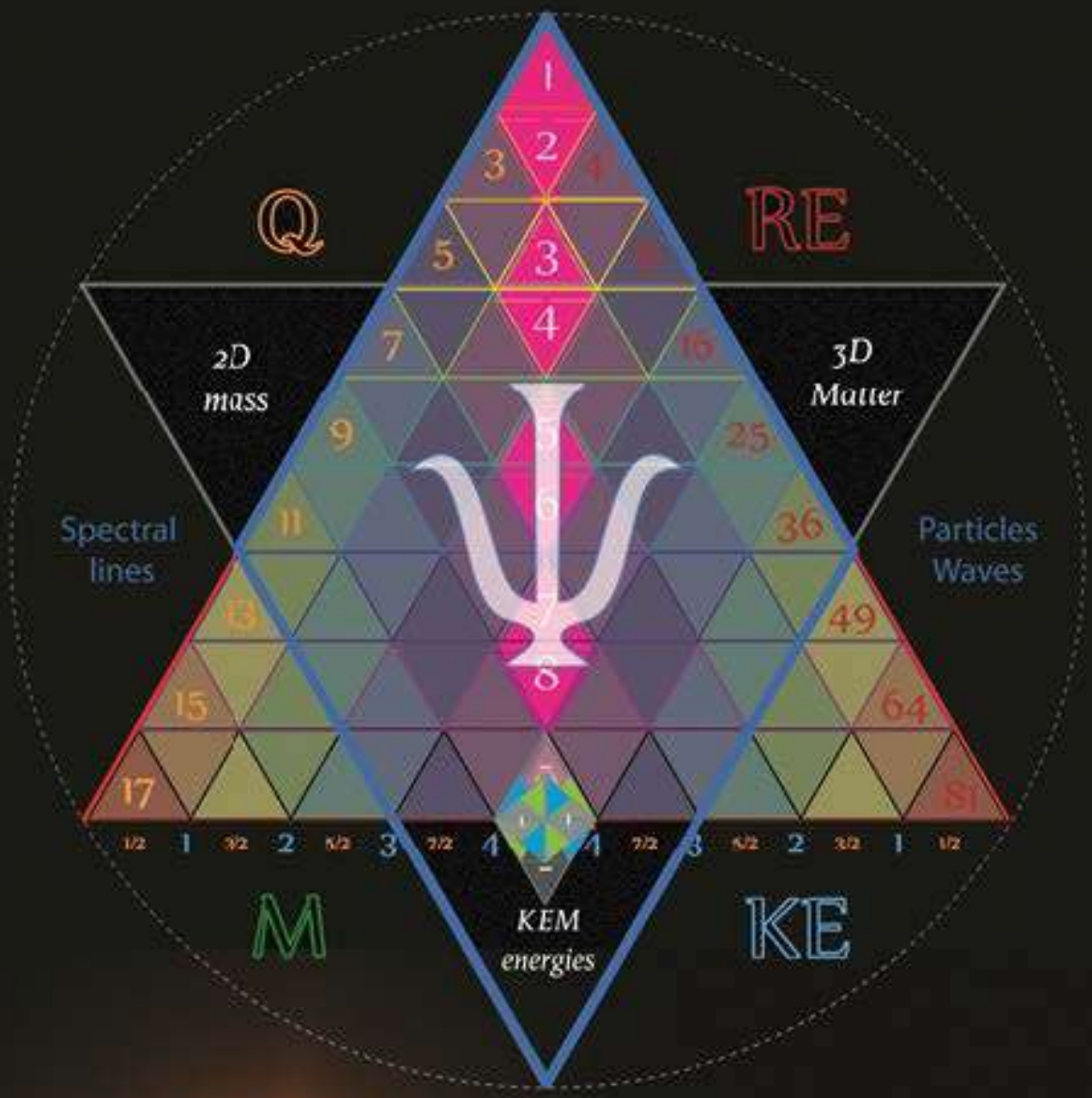
TETRYONICS

The charged geometry of mass-ENERGY-Matter in motion



Foundational Quantum Electrodynamics

Abraham

ISBN 978-0-987288-2-4
[Second Edition © 2012]

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James Clerk Maxwell

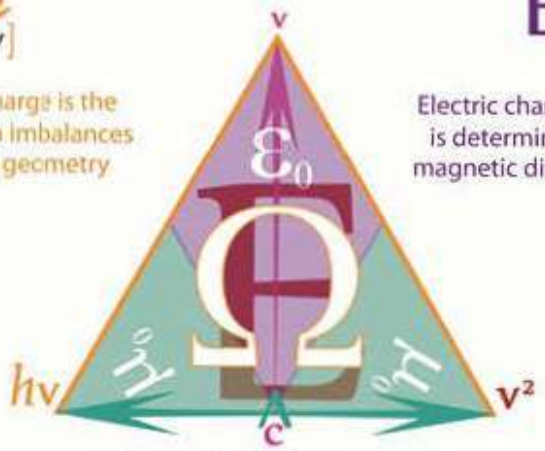
(13 June 1831 – 5 November 1879)

Maxwell's equations describe how Electric and Magnetic fields are generated and altered by each other and by charges and currents.

Q [v-v]

Net Electric charge is the result of quanta imbalances in equilateral geometry

EM Planck Energy



ORTHOGONAL MAGNETIC DIPOLE FIELD

E

Electric charge polarity is determined by the magnetic dipole vector

$$\oint \vec{E}\cdot d\vec{A} = \frac{q}{\varepsilon_0}$$ Gauss's Law for Electricity

$$\oint \vec{B}\cdot d\vec{A} = 0$$ Gauss's Law for Magnetism

$$\oint \vec{E}\cdot d\vec{s} = \frac{-d\Phi_B}{dt}$$ Faraday's Law

$$\oint \vec{B}\cdot d\vec{s} = \mu_0 i + \frac{\mu_0 \varepsilon_0 d\Phi_E}{dt}$$ Ampere's Law

E = electric field
A = area
q = charge
ε_0 = permittivity of free space (a constant)
B = magnetic field intensity
s = path length
Φ_B = magnetic flux
Φ_E = electric flux
t = time
μ_0 = permeability of free space (a constant)
i = current electric charge
$\mu_0\varepsilon_0 = 1/c^2$, where c=speed of light

Maxwell's Equations

Maxwell's equations are a set of partial differential equations that, together with the Lorentz force law, form the foundation of classical electrodynamics, classical optics, and electric circuits.

ElectroMagnetic fields in turn provide the foundation of our modern electrical and communications technologies.

q [+0] POSITIVE [Ω] CHARGE

E Field strength equal to dipole M-field

seconds

Q — **Gauss' Law of Electric Flux**
Electric fields diverge from Electric charge, and produce the Coulomb force,

N — **Gauss' Law of Zero Nett Magnetism**
there are no isolated Magnetic poles, but the Henry force acts between the poles of a magnet,

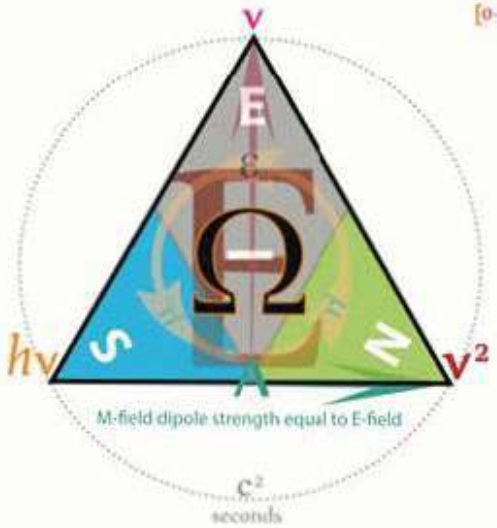
ε_0 — **Faraday's Law of Inductance**
Electric fields are produced by changing Magnetic fields,

Ampere's Circuital Law
circulating Magnetic fields are produced by moving Electric fields and by electric currents.

Q — Q

S — μ_0

NEGATIVE [Ω] CHARGE q [0-]



M-field dipole strength equal to E-field

seconds

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Gauss' Laws

- Gauss' Law of Electric Flux and
- Gauss' Law of Magnetic dipoles

The laws were formulated by Carl Friedrich Gauss in 1835, but was not published until 1867.

They form two of Maxwell's equations which are the basis of classical electrodynamics.

The other two being:
- Faraday's law of induction, and
- Ampère's law with Maxwell's correction.

Gauss's law can be used to derive Coulomb's law, and vice versa.

Equilateral triangles are the foundational charge geometry of EM mass-Energy and Matter

Electric Charge
results from an imbalance of Energy momenta quanta in v² geometries

Carl Friedrich Gauss

(30 April 1777 – 23 February 1855)

Although originally envisaged as a property applied to spherical geometries and usually illustrated with square sectional boundaries integrating a surface area

$$\Phi = EA = E4\pi r^2 = \frac{Q}{\varepsilon_0}$$

Charge is shown to be the result of the symmetry of equilateral quantised angular momenta

Integral form

$$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0} = 4\pi k q$$

Differential form

$$\nabla \cdot E = \frac{\rho}{\varepsilon_0} = 4\pi k \rho$$

Electric fields are divergent from their source

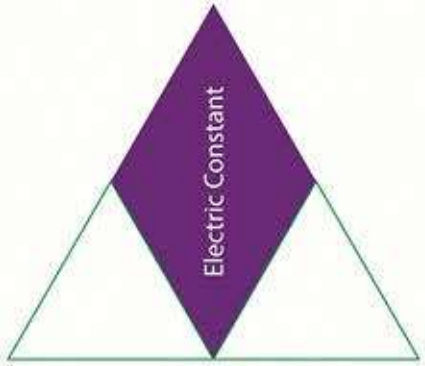
Integral form

$$\oint \vec{B} \cdot d\vec{A} = 0$$

Differential form

$$\nabla \cdot B = 0$$

There are NO Magnetic Monopoles

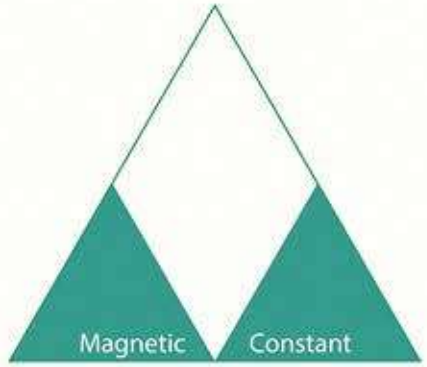


$$\varepsilon_0 = 8.85418785\text{e-}12 \ \frac{F}{m}$$

$$\oint \vec{E} \cdot d\vec{A} = \frac{q}{\varepsilon_0}$$

$$\oint \vec{B} \cdot d\vec{A} = 0$$

The electric flux through any closed surface is proportional to the enclosed electric charge



$$\mu_0 = 1.25663706\text{e-}6 \ \frac{H}{m}$$

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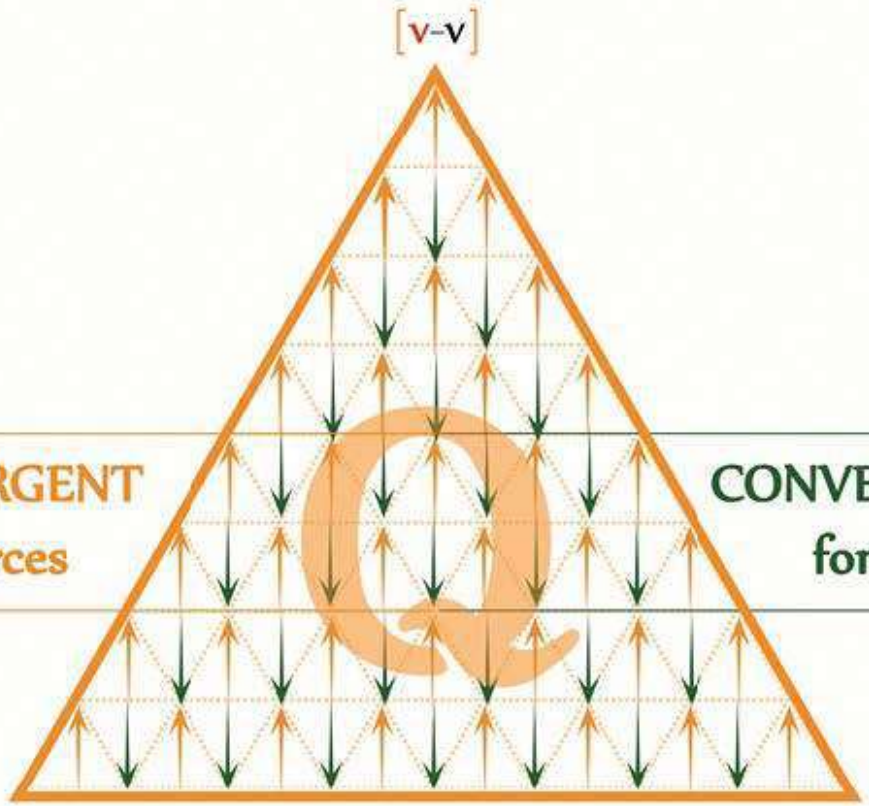
The Divergent force of Charge



Charged EM fields create a net DIVERGENT force
as a result of their outward radiant energy momenta

but still possess CONVERGENT forces as a result of
their inherent equilateral energy momentum symmetries

Where these radiant charged fields diverge from their source
and overlap their superpositional energy momenta
create the forces of the Law of Interaction

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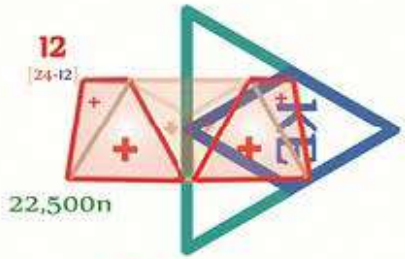
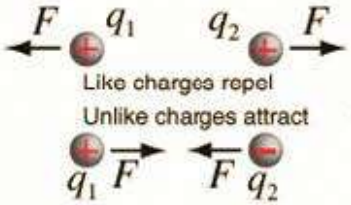
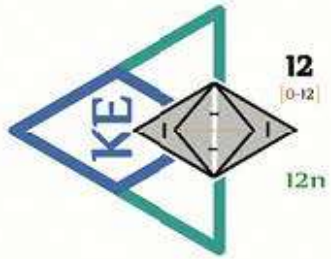
Coulomb's Law



Proton

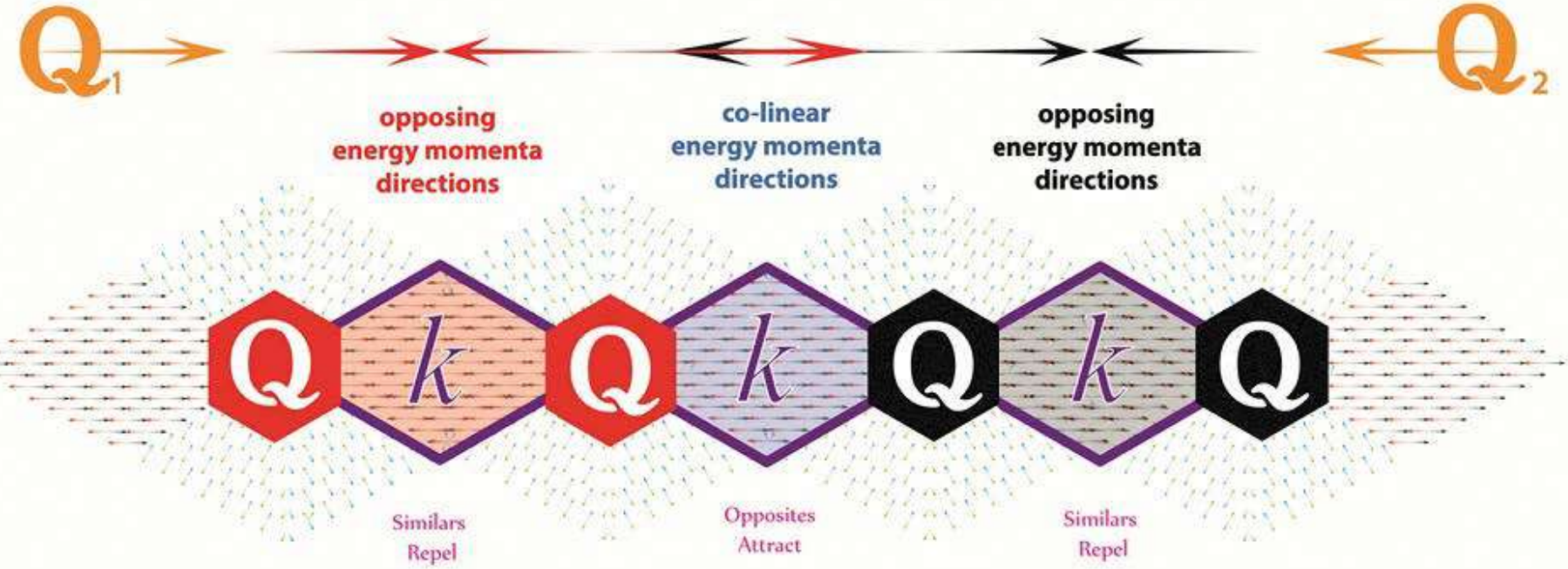


$$F = \frac{kq_1q_2}{r^2} = \frac{q_1q_2}{4\pi\varepsilon_0 r^2}$$ Coulomb's Law



Electron

The magnitude of the electrostatic force between two point electric charges is directly proportional to the product of the magnitudes of each of the charges and inversely proportional to the square of the distance between the two charges.



The law of Interaction

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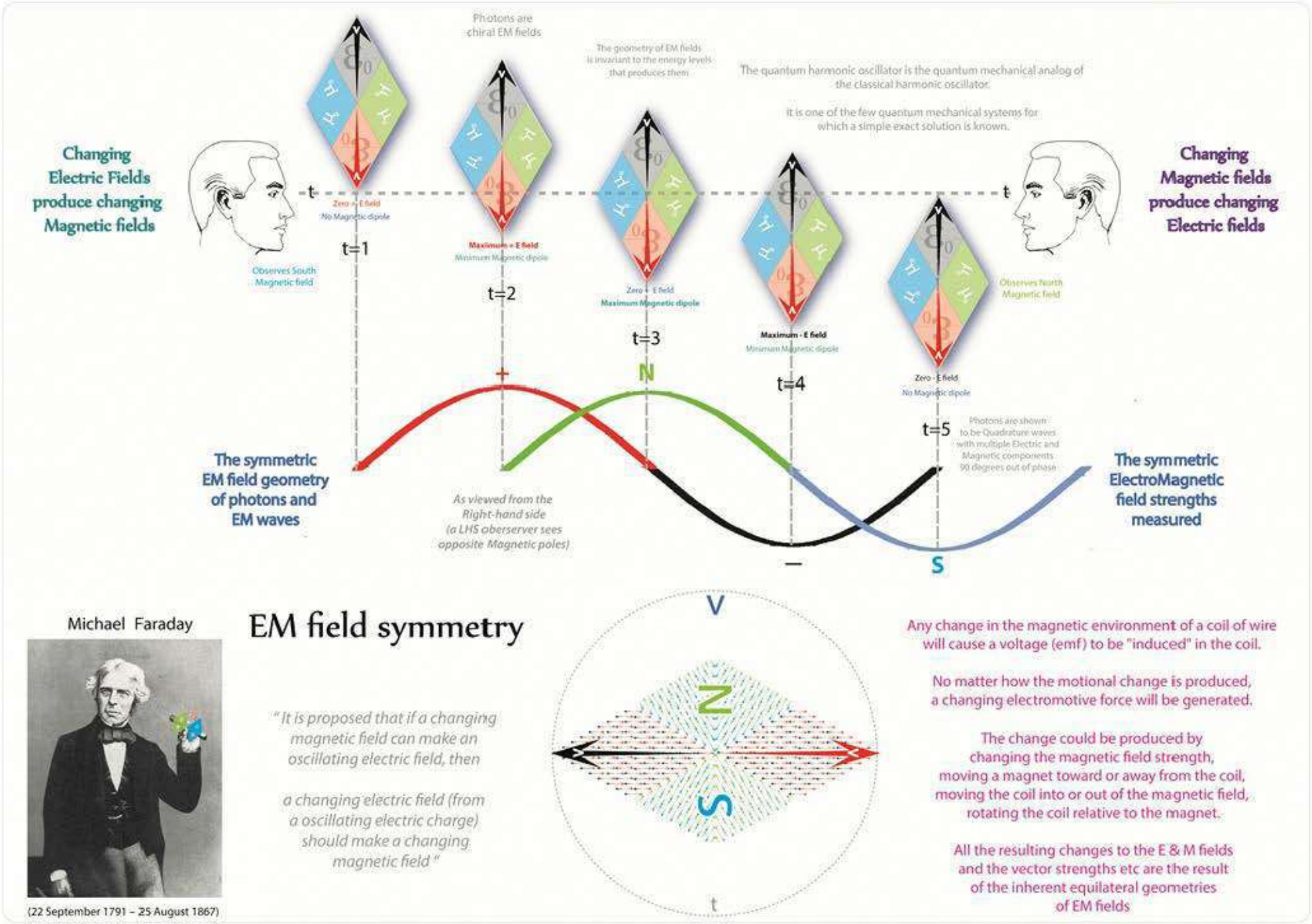
Photons are chiral EM fields
The geometry of EM fields is invariant to the energy levels that produces them
The quantum harmonic oscillator is the quantum mechanical analog of the classical harmonic oscillator.
It is one of the few quantum mechanical systems for which a simple exact solution is known.
Changing Electric Fields produce changing Magnetic fields
Changing Magnetic fields produce changing Electric fields
Observes South Magnetic field
Observes North Magnetic field
t=1
t=2
t=3
t=4
t=5
Zero + E field
No Magnetic dipole
Maximum + E field
Minimum Magnetic dipole
Zero + E field
Maximum Magnetic dipole
Maximum - E field
Minimum Magnetic dipole
Zero - E field
No Magnetic dipole
+
N
–
S
Photons are shown to be Quadrature waves with multiple Electric and Magnetic components 90 degrees out of phase
The symmetric EM field geometry of photons and EM waves
As viewed from the Right-hand side (a LHS oberserver sees opposite Magnetic poles)
The symmetric ElectroMagnetic field strengths measured

Michael Faraday

(22 September 1791 – 25 August 1867)

EM field symmetry

"It is proposed that if a changing magnetic field can make an oscillating electric field, then

a changing electric field (from a oscillating electric charge) should make a changing magnetic field"

Any change in the magnetic environment of a coil of wire will cause a voltage (emf) to be "induced" in the coil.

No matter how the motional change is produced, a changing electromotive force will be generated.

The change could be produced by changing the magnetic field strength, moving a magnet toward or away from the coil, moving the coil into or out of the magnetic field, rotating the coil relative to the magnet.

All the resulting changes to the E & M fields and the vector strengths etc are the result of the inherent equilateral geometries of EM fields

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Electromagnetic Induction

All ElectroMagnetic circuits are comprised of quantum inductive fields [ZPFs] and energies that obey Newton's third law and the conservation of energy

EM field coupling

Electromagnetic induction is the production of an electric current across a conductor moving through a magnetic field.
It underlies the operation of generators, transformers, induction motors, electric motors, synchronous motors, and solenoids.

$$|\mathcal{E}| = \left|\frac{d\Phi_B}{dt}\right|$$

Michael Faraday formulated that electromotive force (EMF) produced around a closed path is proportional to the rate of change of the magnetic flux through any surface bounded by that path.

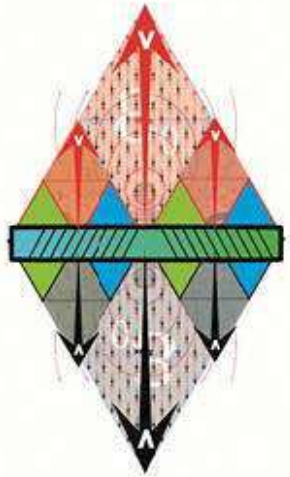
$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$V_\mathrm{P} = N_\mathrm{P}\frac{\mathrm{d}\Phi}{\mathrm{d}t}.$$

For the special case of a coil of wire, or a transformer circuit composed of N loops with the same area, Faraday's general equation becomes

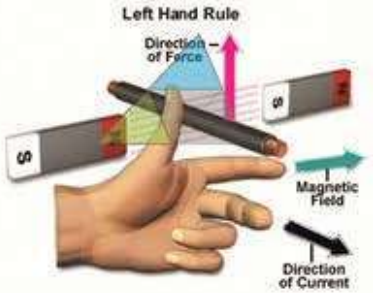
$$V_\mathrm{s} = N_\mathrm{s}\frac{\mathrm{d}\Phi}{\mathrm{d}t},$$

Inductive Coupling

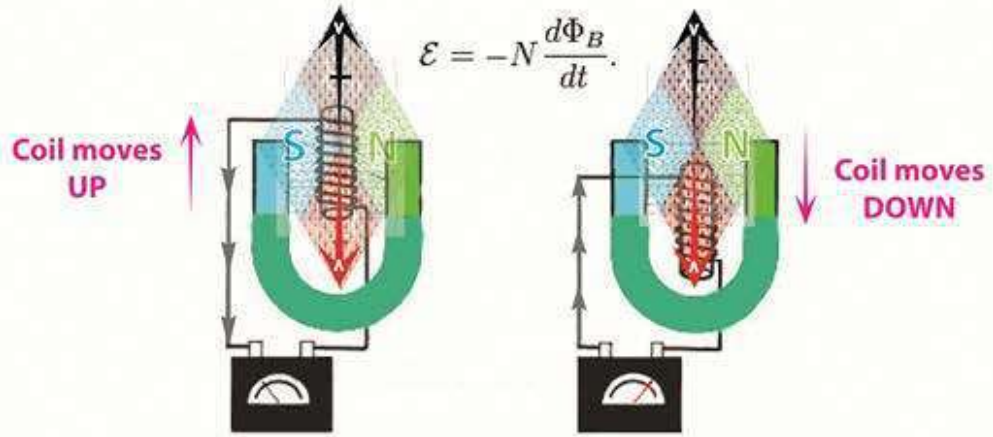


A corollary of Faraday's Law, together with Ampère's law and Ohm's law is Lenz's law:
The EMF induced in an electric circuit always acts in such a direction that the current it drives around the circuit opposes the change in magnetic flux which produces the EMF

$$\mathcal{E} = -N\frac{d\Phi_B}{dt}.$$

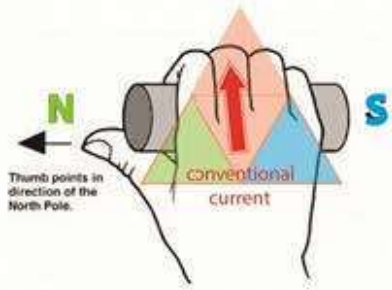


Flemings left hand rule
(for electric motors)



An electric current passes through a solenoid, resulting in a magnetic field. When you wrap your right hand around the solenoid with your fingers in the direction of the conventional current, your thumb points in the direction of the magnetic north pole.

An electric current passes through a straight wire. Here, the thumb points in the direction of the conventional current (from positive to negative), and the fingers point in the direction of the magnetic lines of flux.



Fleming's right hand rule
(for EM induction)

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Faraday's Law of Induction

Michael Faraday

(22 September 1791 – 25 August 1867)

Electromagnetic induction is the production of a potential difference (voltage) across a conductor when it is exposed to a varying magnetic field.

In the frame of a conductor moving relative to the magnet, charged particles in the conductor experience a coulombic force due to the neutralised electric fields of the permanent magnet.

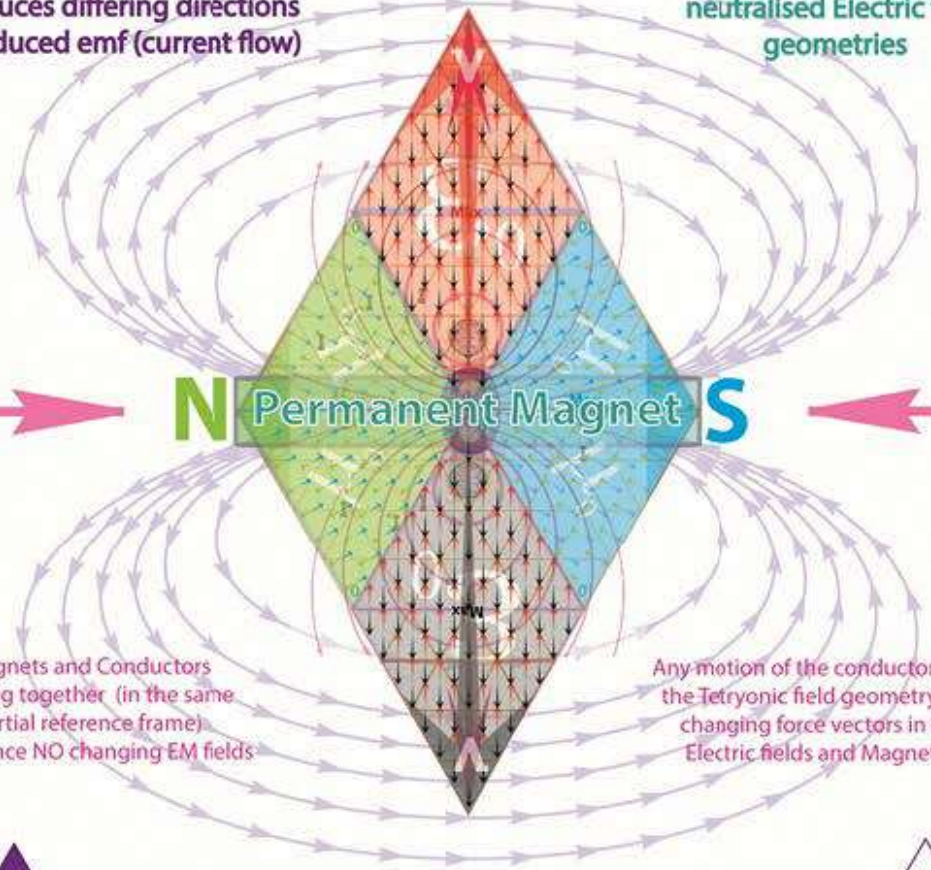
Faraday's law states that: The induced electromotive force (emf) in any closed circuit is equal to the time rate of change of the magnetic flux through the circuit.

$$\oint \vec{E} \cdot \vec{ds} = -\frac{d\Phi_B}{dt}$$

The motion of EM fields creates an induced motion in external fields and particles

The linear energy momenta of the neutralised E-fields produces differing directions of induced emf (current flow)

A permanent magnet has a static Magnetic dipole field and neutralised Electric field geometries



Charged particles in the conductor are subject to voltage emfs

Charged particles in the conductor are subject to voltage emfs

Magnets and Conductors moving together (in the same inertial reference frame) experience NO changing EM fields

Any motion of the conductor relative to the Tetryonic field geometry produces changing force vectors in both the Electric fields and Magnetic fields

An Electrostatic (charged) particle has Electric fields of a particular polarity and neutralised Magnetic fields

It is impossible (due to the geometry of EM fields) to move either the permanent Magnet or the Conductor without producing variations in the Electric and Magnetic fields

A Magneto-static body of Matter has a dipolar Magnetic field and neutralised Electric fields

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Ampere's Law

In classical electromagnetism, Ampère's circuital law, relates the integrated magnetic field around a closed loop to the electric current passing through the loop.

Q

[v-v]

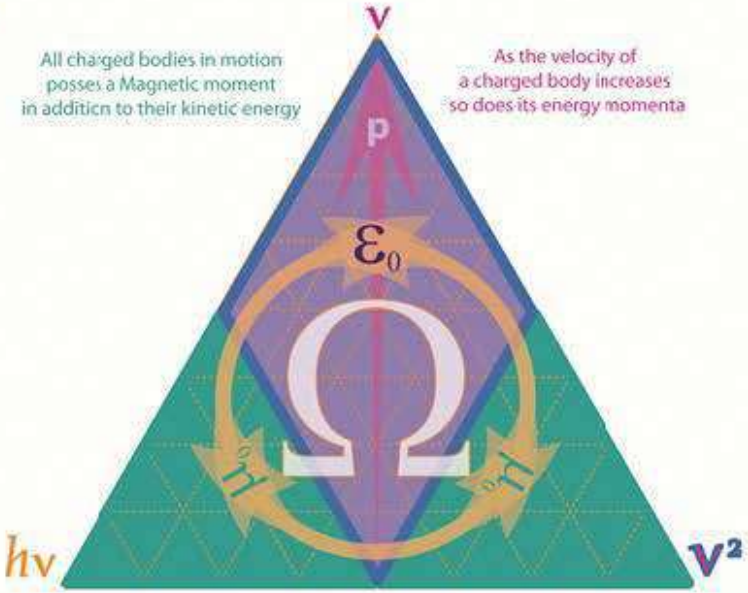
All energy momenta quanta have equilateral geometries, [quantised angular momenta [Ω]] that can be modelled as a continuous steady current within a closed inductive loop

$$\oint \vec{B} \cdot \vec{ds} = \mu_0 i + \frac{1}{c^2} \frac{\partial}{\partial t} \int \vec{E} \cdot d\vec{A}$$

The nett Charge of any particle or surface is the result of the quantised equilateral energy momenta symmetries of its integral surface area

All charged bodies in motion posses a Magnetic moment in addition to their kinetic energy

As the velocity of a charged body increases so does its energy momenta



$$\oint_C \mathbf{B} \cdot \mathrm{d}\boldsymbol{\ell} = \mu_0 I_{\mathrm{enc}}$$

$$\mathbf{J_f} + \mathbf{J_D} + \mathbf{J_M} = \mathbf{J_f} + \mathbf{J_P} + \mathbf{J_M} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t} = \mathbf{J} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t} ,$$

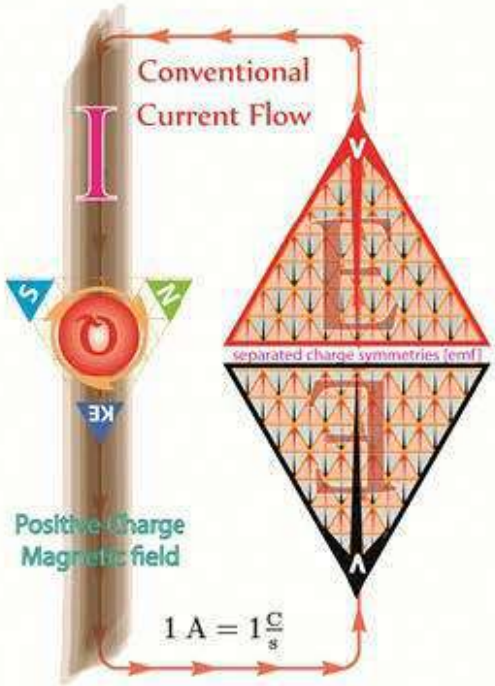
With the addition of Maxwell's Displacement current to account for time varying electric fields without a physical flow of charged Matter the way forward is paved for Planck, Lorentz and Tetryonics

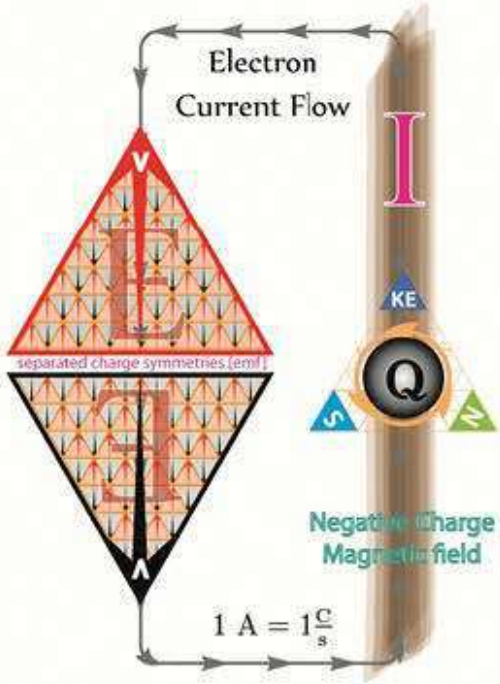
The Closed circuit or loop can be any geometric shape with Tetryonics dictating equilateral [triangular] Planck energies & quantum charge geometries with Tetrahedral geometries for Matter quanta

Andre Ampere

(20 January 1775 – 10 June 1836)

Ampere's law relates magnetic fields to the electric currents that produce them.





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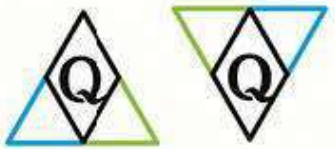
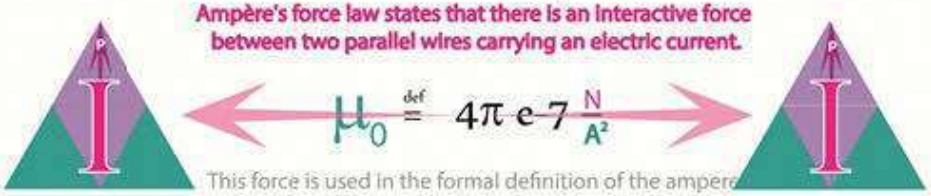


$$F = 2k_A \frac{I_1 I_2}{r}$$

Ampère's force law states that there is an interactive force between two parallel wires carrying an electric current.



$$\mu_0 \overset{\text{def}}{=} 4\pi \cdot 10^{-7} \frac{N}{A^2}$$

This force is used in the formal definition of the ampere which states that it is "the constant current which will produce an attractive force of 2 × 10−7 newtons per metre of length between two straight, parallel conductors of infinite length and negligible circular cross section placed one metre apart in a vacuum"

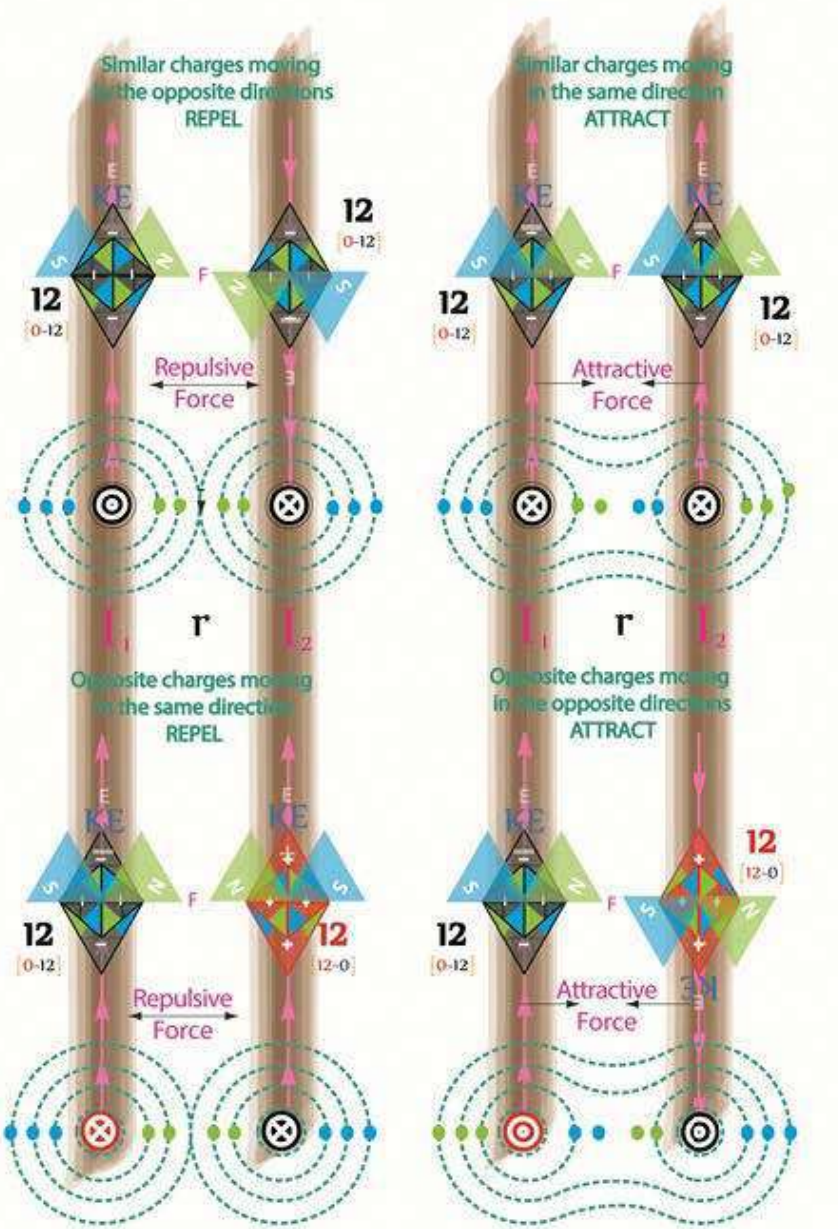
These attrcctions and repulsions between electric currents differ fundamenially from the effects produced by electricity in repose. First, they :ease, as chemical decompositions do, as soon as we break the circuit. Second, in ordinary electric attractions and repulsions, opposite charges attract, and like charges repel; in the attractions and repulsions of electric currents, we have precisel, the contrary; it is when the two conducting wires are placed parallel in such a way that their ends of the same sign are next to each other that there is attraction, and there is repulsion when the ends of the same sign are as far apart as possible. Third, in the case of attraction, when it is sufficiently strong to bring the movable conductor into contact with the fixed conductor, they remain attached to one another like two magnets, and do not separate after a while, as happens when two conducting bodies, oppositely electrified, come to touch.

André Marie Ampère (1775 - 1836)

Figure 3

$$1\ \text{A} = 1\frac{\text{C}}{\text{s}}$$

Interactive force between Conductors



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ElectroMotive exchange particles

W

All four of the fundamental forces involve the exchange of ODD numbers of electromagnetic charge bosons so as to transfer discrete energy momenta between separated Matter

In ElectroMagnetic field or circuits, when charged Matter moves along electric field lines, electrical work is done on them by the electromotive force, whether it involves storing potential energy (negative work) or increasing kinetic energy (positive work)

γ

The EM exchange force denotes a force produced by the exchange of force carrier particles, such as the electromagnetic force produced by the exchange of photons between electrons

KEM field energy momenta attracts opposite charges

In accordance with Newton's 3rd Law Q2 can also act on Q1 via the superpositioning of energy fields and their momenta

This layered interaction of EM force quanta [EM charge carriers - Z bosons & Photons] is what constitutes the electromotive inductive force [emf]

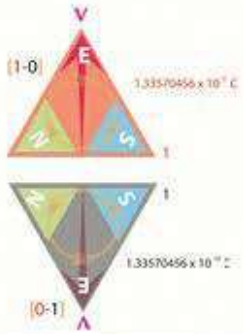
The closer that Q1 and Q2 are, the greater the effect.

KEM field energy momenta repels same charge particles

Bosons

$$1\pi_{\text{Charge}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field — Planck quanta — ElectroMagnetic — mass — velocity



Photons

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field — Planck quanta — ElectroMagnetic — mass — velocity

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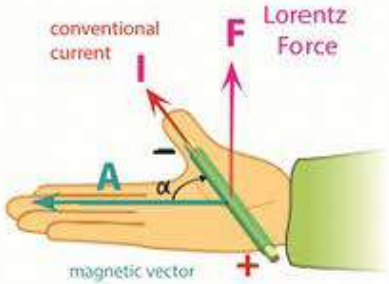


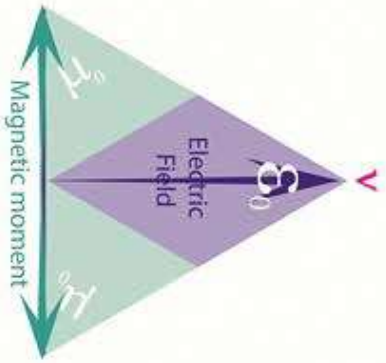
In physics, the Lorentz force is the force on a point charge due to electromagnetic fields.

It is given by the following equation in terms of the electric and magnetic fields

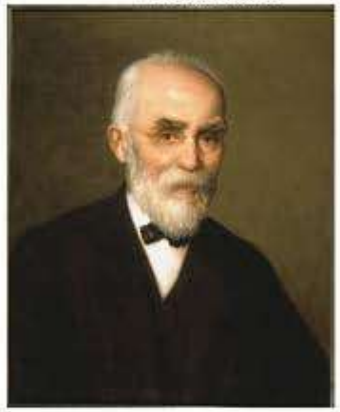
Lorentz Force

The magnetic force component of the Lorentz force manifests itself as the force that acts on a current-carrying wire in a magnetic field.

In that context, it is also called the Laplace force.



Hendrik Lorentz

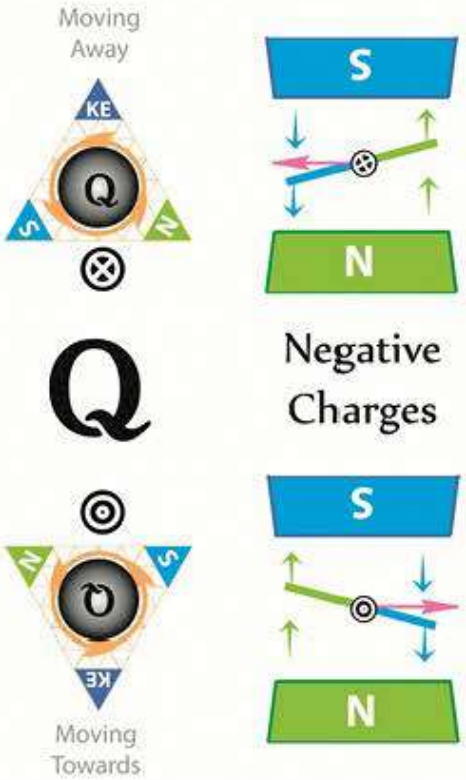


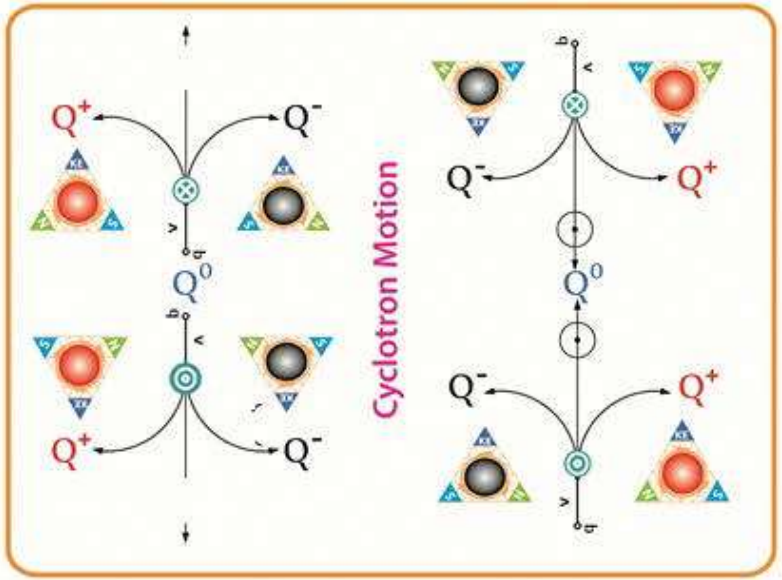
(18 July 1853 – 4 February 1928)

$$\vec{F} = q\vec{E} + q\vec{v} \times B$$

LORENTZ force = *Electric force* + *charge velocity* × *Magnetic force*

Magnetic fields created by moving charges are perpendicular to the direction of motion (and can do NO work)





Up out of page ⊙ Magnetic Field ⊗ Down into page

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Work - Force - Energy

Work is the result of energy-momenta transfer (by means other than Matter-transfer), and produces changes in the second system's nett energy-momenta

Work

refers to an activity involving a force and movement in the directon of the force

Work

$$W = F.d = ma.d = E$$

The Planck constant is the quantum of Action

$$kg\,\frac{m}{s^2}\,m$$

Mechanical work is a scalar quantity that can be described as the product of a force times the distance through which it acts

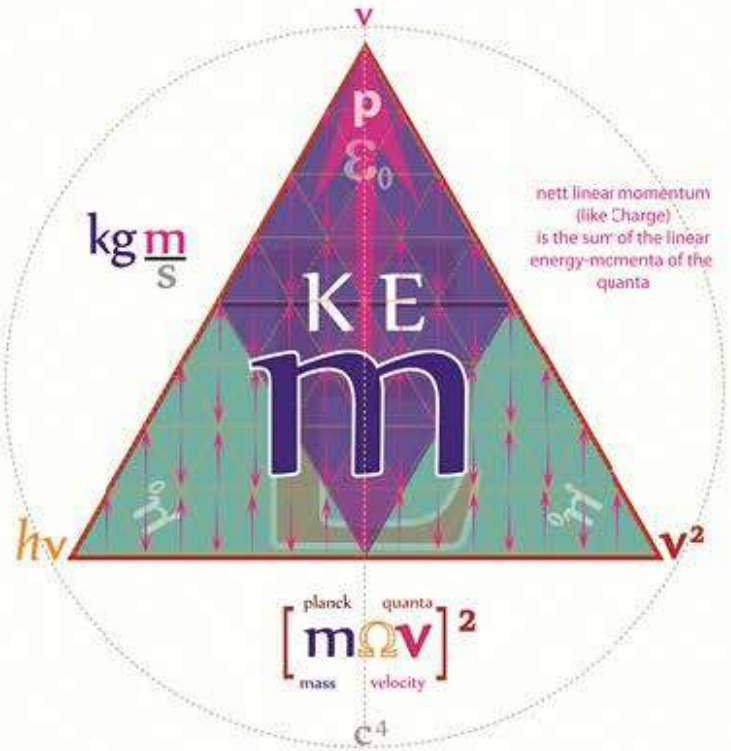
[Force per meter]

Force

$$ma = \frac{\Delta p}{\Delta t} = \Delta\left[\frac{mv}{t}\right]$$

$$kg\,\frac{m}{s^2}$$

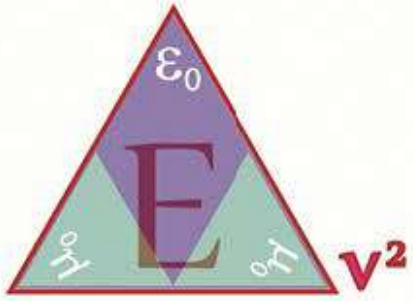
Momentum is the quantum of Force



Power is defined as the rate of using Energy or the rate of doing work

Energy

is the scalar capacity to do work
You must have energy to accomplish work



Energy

$$E = mv^2 = hv^2$$

Energy is the square of Momentum

$$kg\,\frac{m^2}{s^2}$$

Energy is always equivalent to the ability to exert pulls or pushes against the basic forces of nature, along a path of a certain length.

[mass-energy momentum squared]

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Watts
[Joules per second]

WORK

Force per second

In Classical Mechanics

One watt is the rate at which work is done when an object's velocity is held constant at one meter per second against constant opposing force of one newton.

Work in physics is measured in Joules

Nm/s

James Watt

(19 January 1736 – 25 August 1819)

The watt second is a unit of energy, equal to the joule

$$W = \frac{J}{s} = \frac{N \cdot m}{s} = \frac{kg \cdot m^2}{s^3}$$

One Watt, defined as one joule per second, measures the rate of energy conversion.

$$W = V.A$$

Energy / second
[Joules/sec]

POWER

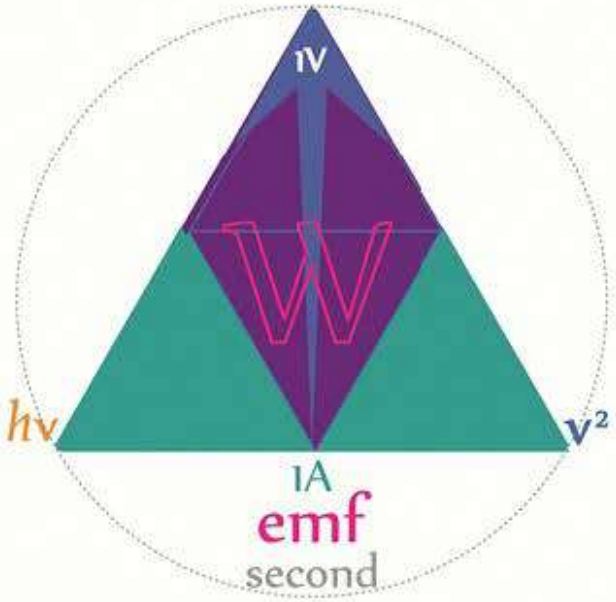
Energy per second

In ElectroDynamics

One watt is the rate at which work is done when one ampere (A) of current flows through an electrical potential difference of one volt (V).

Electrical power is measured in Watts

J/s



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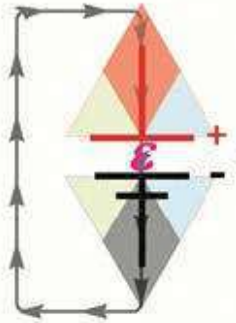
The electromotive Force

The electromotive force, or most commonly emf (seldom capitalized), or (occasionally) electromotance is "that which tends to cause current (actual electrons and ions) to flow.

A conductor creates a circuit between the 'Quantum potentials' allowing charges to seek an eqilibrium (current flow)

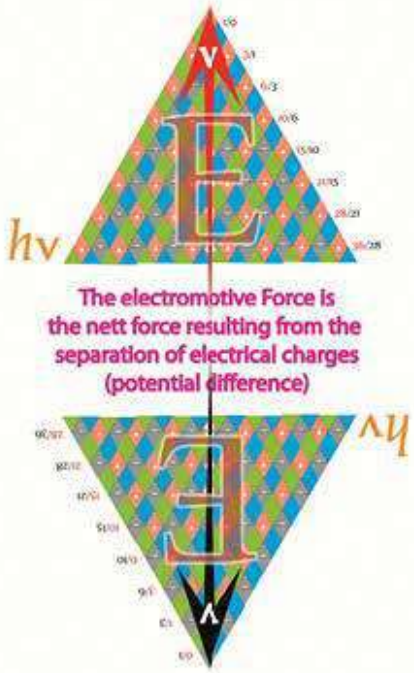


$$\mathcal{E} = -\frac{d\Phi_B}{dt},$$

"A source emf can be thought of as a kind of charge pump that acts to move charge from a point of high potential through its interior to a point of opposite potential. ...

By chemical, mechanical or other means, the source of emf performs work dW on that charge to move it to the high potential terminal. The emf of the source is defined as the work dW done per charge dq: = dW/dq."

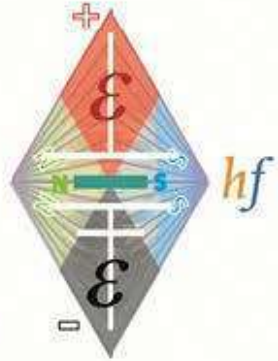
Electric Fields contain bi-directional energy-momenta



The electromotive Force is the nett force resulting from the separation of electrical charges (potential difference)

Separated charges produce an electromotive force

A Magnet stores charge quanta (bosons) in static Electro-Magnetic fields that in turn produce a Magnetic dipole



A Magnet can be viewed as a neutralised quantum emf source

emf is shown to be the nett force resulting from the linear momenta quanta in every Electric 'voltage' field

These momenta accelerate charged particles in one of two directions dependent of the particle's nett charge

All Charges seek Equilibrium

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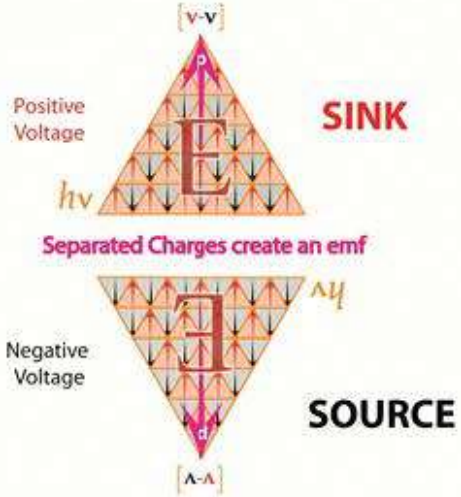
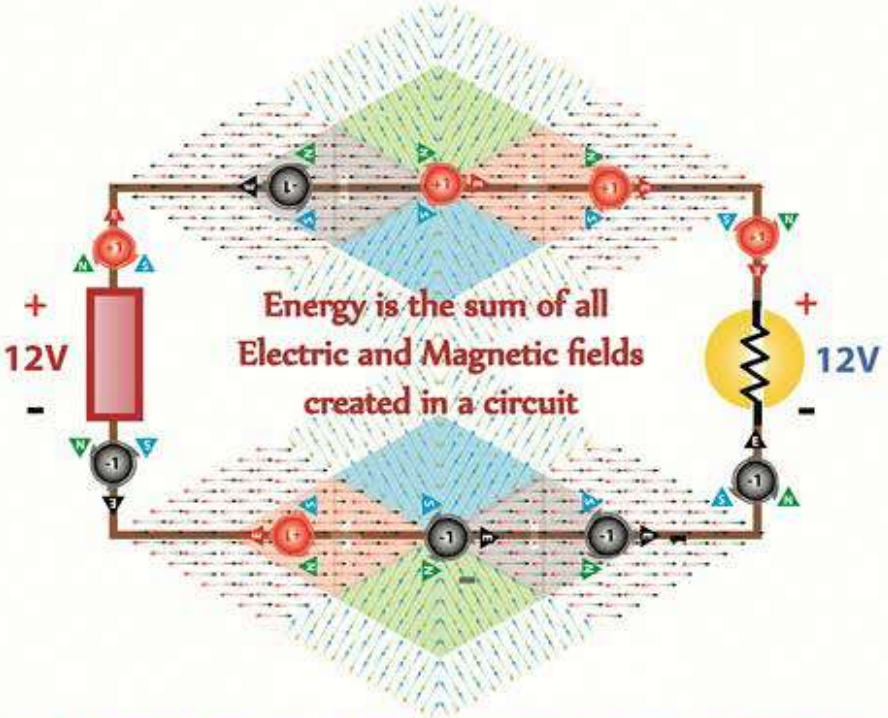
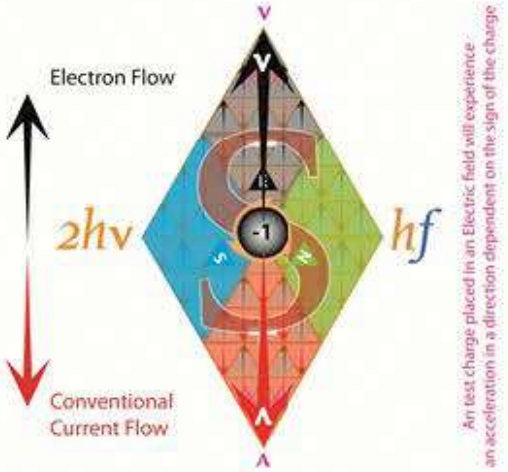
Poynting Vectors

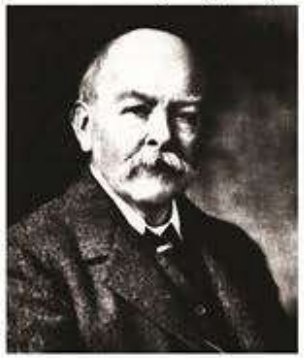




Poynting Field


Electron Flow
2hv
hf
Conventional Current Flow
An test charge placed in an Electric field will experience an acceleration in a direction dependent on the sign of the charge

John Henry Poynting



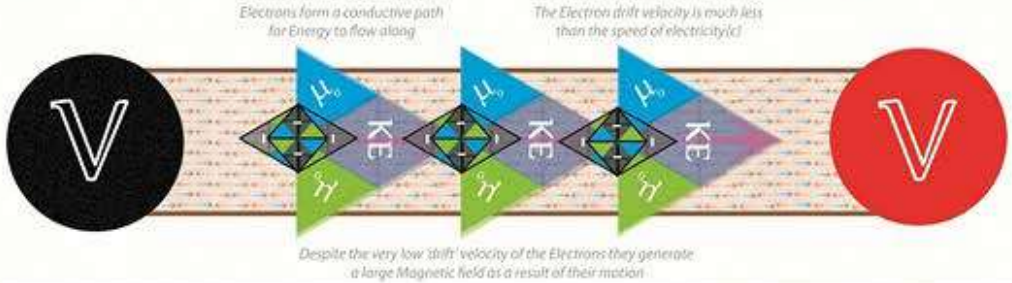
(9 September 1852 – 30 March 1914)

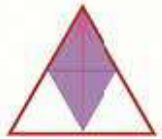
Electrical energy is transferred along a conductive path in an electrical circuit accelerating charged particles and ions in turn imbuing them with Kinetic Energy [voltage leads current]

There is an electric field running down the middle of the wire, which extends to just beyond its surface.

This electric field pushes the charges along against the resistance and adds to the electric field caused by the surface charges. The resultant electric field changes its direction around the circuit as the wires form a loop back to the battery.

Moving charged topologies inside the wire create a secondary magnetic field geometry around the wire


Electrons form a conductive path for Energy to flow along
The Electron drift velocity is much less than the speed of electricity(c)
V
KE
V
Despite the very low 'drift' velocity of the Electrons they generate a large Magnetic field as a result of their motion



Energy momenta

$$S = E \times H$$

Energy is transferred through empty space around (and NOT in) the wires of an electric circuit via an electromagnetic field called the Poynting field

It's important to remember that the current doesn't flow in both directions, only the energy does

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Coulomb's Electric Interactions

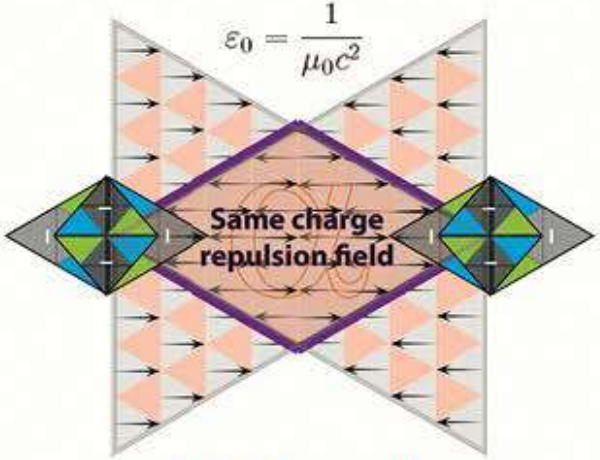
$$k = \frac{1}{4\pi\varepsilon_0}$$

The proportionality constant ke, called the Coulomb constant (sometimes called the Coulomb force constant), is related to defined properties of linear EM energy momentum and is used to define Electric field forces

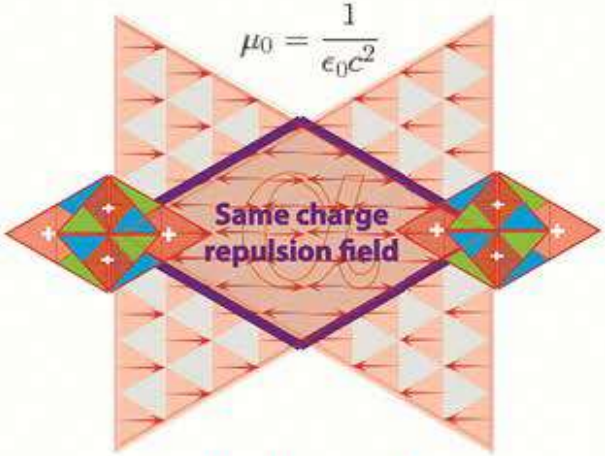
$$c = \frac{1}{\sqrt{\mu_0\varepsilon_0}}$$

$$8.987\ e9\ \frac{Nm^2}{C^2}$$

$$\varepsilon_0 = \frac{1}{\mu_0 c^2}$$



$$\mu_0 = \frac{1}{\varepsilon_0 c^2}$$



Similars repel

Opposites attract

Similars repel

Linear Coulombic force interactions are a result of charged E field linear momenta

Longitudinal E field forces between Charged particles are mediated by Photons

$$\mathbf{E} = \frac{\mathbf{F}}{q_t}$$

$$\mathbf{E} = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}\hat{\mathbf{r}}$$

The Electric field can be defined by the Force exerted by a Charge

It is a measure of the interactive force produced by the Electric field energy-momenta of two superpositioned charge KEM fields

The Electric field can also be derived from Coulomb's Law

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Coulomb Force

Electric fields produce Coulombic forces

$$F = k\frac{Q_1 Q_2}{r^2}$$

It is defined as the nett Charge transported by a steady current of one Ampere in one second.

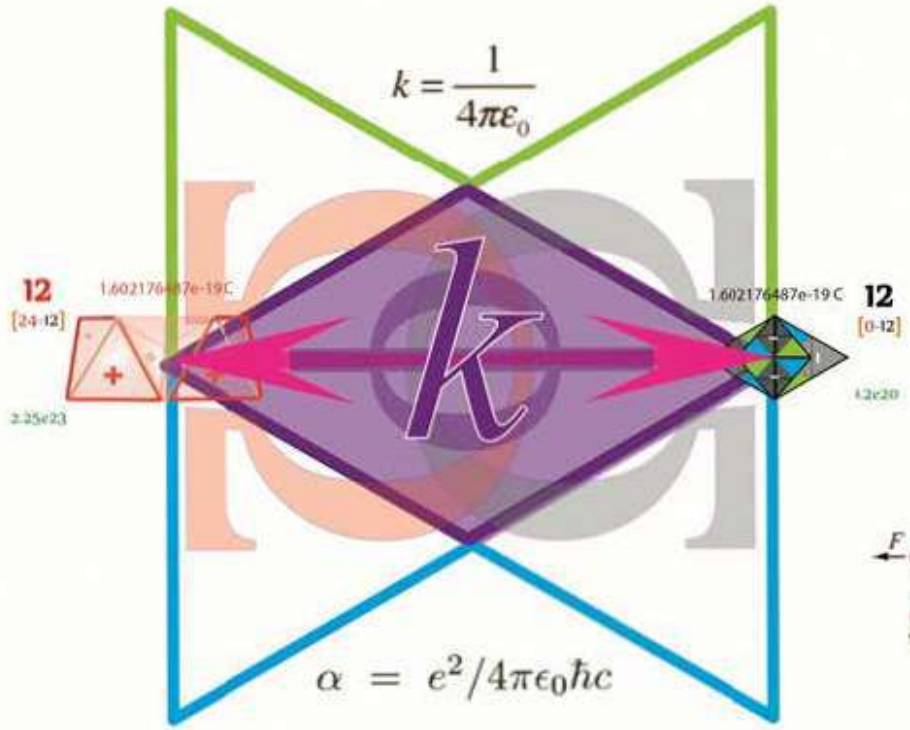
C

1 Coulomb of nett charge is comprised of

$(12 \times 1.335180067\ e{-}20)^{-1}$

6.240355408 e18 electrons

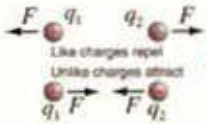
kg.s



Charles-Augustin de Coulomb

(14 September 1736 – 23 August 1806)

Coulomb's Law is a law of physics describing the electric interaction between any two charged particles (and forms the basis for Ampere's Law)



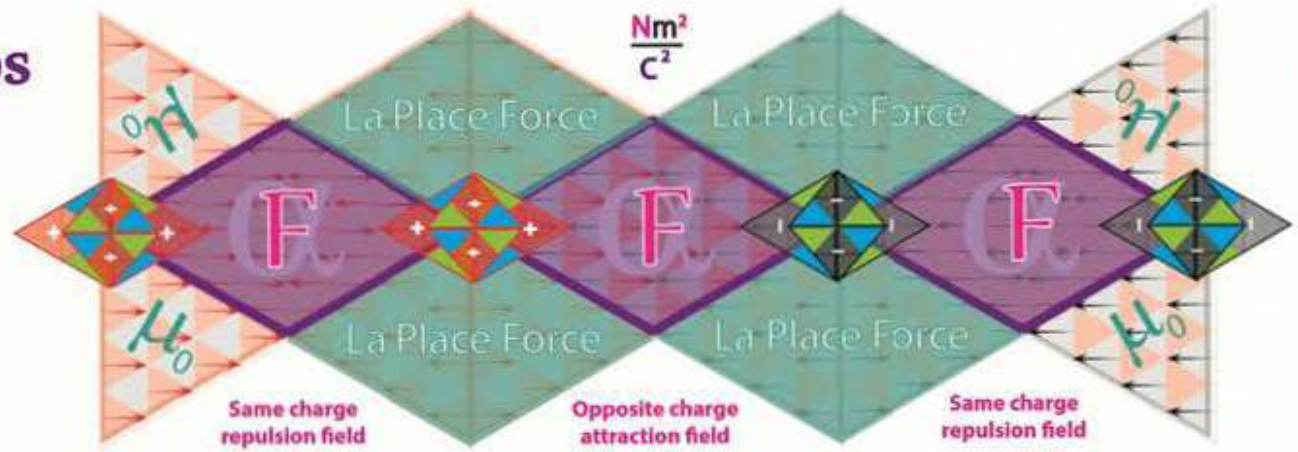
$F = \frac{kq_1q_2}{r^2} = \frac{q_1q_2}{4\pi\varepsilon_0 r^2}$ *Coulomb's Law*

The interactive linear momenta of super-positioned E-fields creates Coulombic forces

Coulombs

As

$1C = 1A \cdot 1s$



Amperes

$\frac{C}{s}$

$1A = 1\frac{C}{s}$

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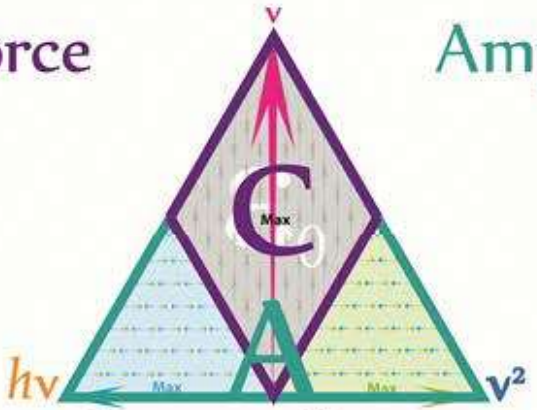
Charles-Augustin de Coulomb

(14 September 1736 – 23 August 1806)

Coulomb force

$$k_c \frac{Q_1 Q_2}{r^2}$$

As



Ampere force

$$2k_A \frac{I_1 I_2}{r}$$

$$\frac{C}{S}$$

Andre Ampere

(20 January 1775 – 10 June 1836)

Lorentz Forces

are the forces on a point charge due to external electromagnetic fields

$$\vec{F} = q[\vec{E} + (\vec{v} \times B)]$$

electric force; velocity

magnetic forces do not accelerate charged particles

Linear acceleration Electric force between charged particles

Q

Same charges

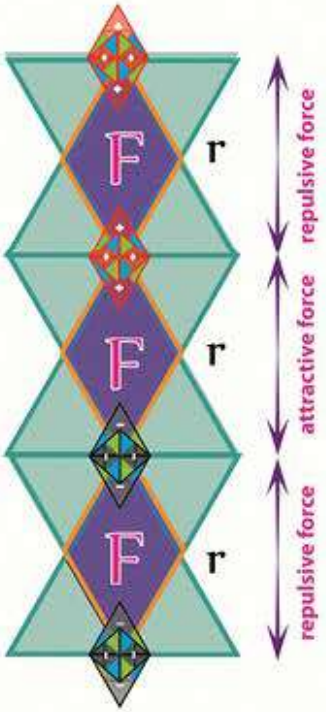
Q

Opposite charges

Q

Same charges

Q



I

The amount of charged mass-Matter topologies moving passing a point per unit time

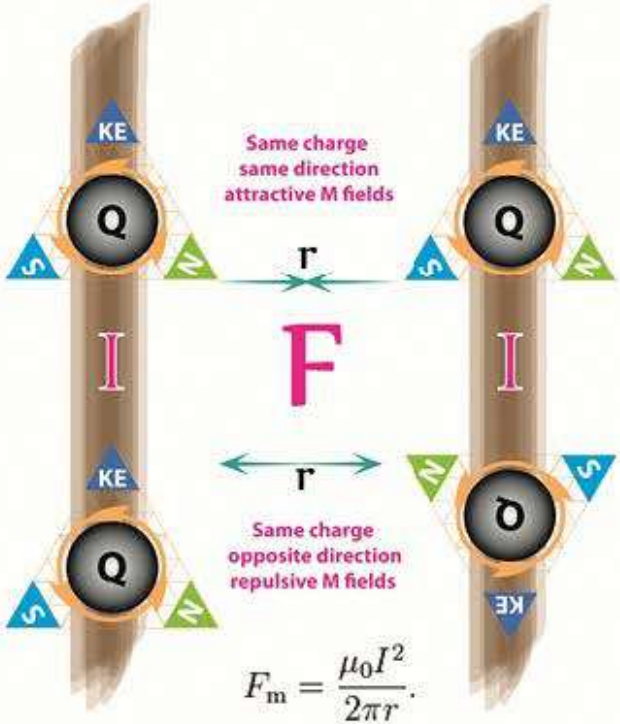
Current

Charge

The angular mass momenta possessed by a steady current of one ampere in one second.

Q

Transverse perturbative Magnetic force between charged particles



$$F_m = \frac{\mu_0 I^2}{2\pi r}.$$

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Capacitance

Any two electrical conductors separated by a non-conducting (or very high resistance) medium is a capacitor
[these can be plates, conductive wires or coaxial cables etc]

Capacitance is a function only of the physical dimensions (geometry) of conductors and the permittivity of the dielectric separating them

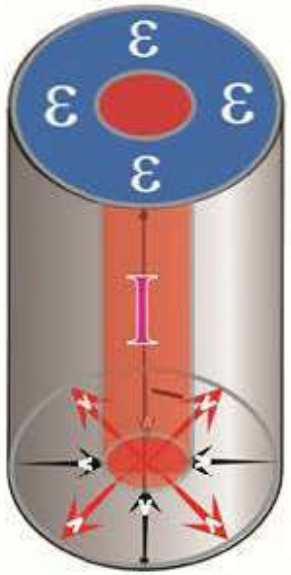
Plate capacitors

separated conductive cables

In general any separated charges will create a emf voltage

should a current flow in the conductors the capacitive field will be dominated by perpendicular, superpositioned amperian M-fields of greater strength

Coaxial cables



The SI unit of capacitance is the farad (symbol: F)
named after the English physicist Michael Faraday;

Capacitance is the ability of a body to store an electrical charge.

$$C = \frac{Q}{V}$$

Any object that can be electrically charged exhibits capacitance

A 1 farad capacitor when charged with1 coulomb of electrical charge will have a potential difference of 1 volt between its plates.

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Amperian Forces

Currents produce magnetic field forces

$$F = 2k_A \frac{I_1 I_2}{r}$$

6.241335 e18 electrons passing a given point per second constitutes one Ampere.

Coulombs are charged masses

m

that produce accelerations

Andre Ampere

(20 January 1775 – 10 June 1836)

Current is charged Matter in motion

M

that produce magnetic fields

A

1 Amp of electrons has a EM mass of

6.241355408 e18 x 8.851486361 e-31

5.524527227 e-12 kg

kg

An Ampere is a Coulomb per second.
a measure of the rate at which charged Matter moves.

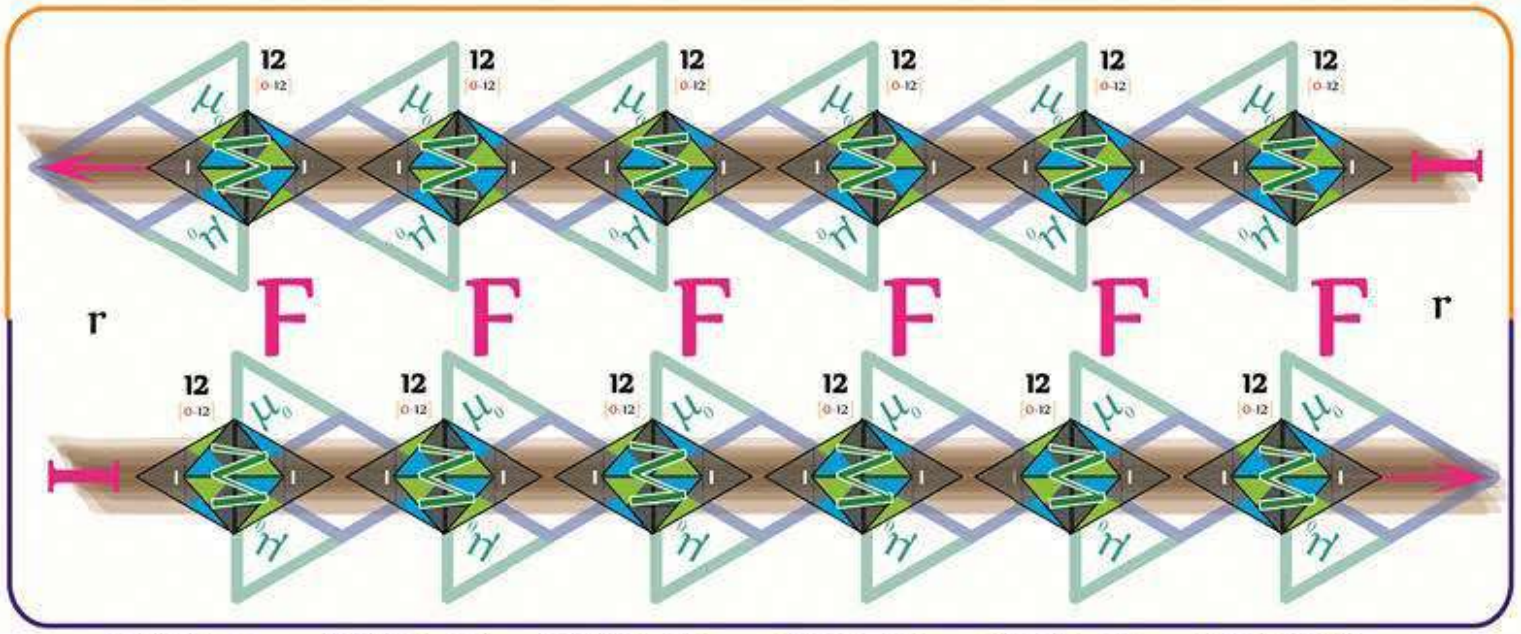
A coulomb is the quantity of charge transported by one amp in one second

1.60221681 e-19 | 1.60221681 e-19 | 1.60221681 e-19 | 1.60221681 e-19 | 1.60221681 e-19 | 1.60221681 e-19

C

$1C = 1A \cdot 1s$

As



A

$1\,A = 1\frac{C}{s}$

$\frac{C}{s}$

8.851486 e-31 kg | 8.851486 e-31 kg | 8.851486 e-31 kg | 8.851486 e-31 kg | 8.851486 e-31 kg | 8.851486 e-31 kg

An ampere is one coulomb per second

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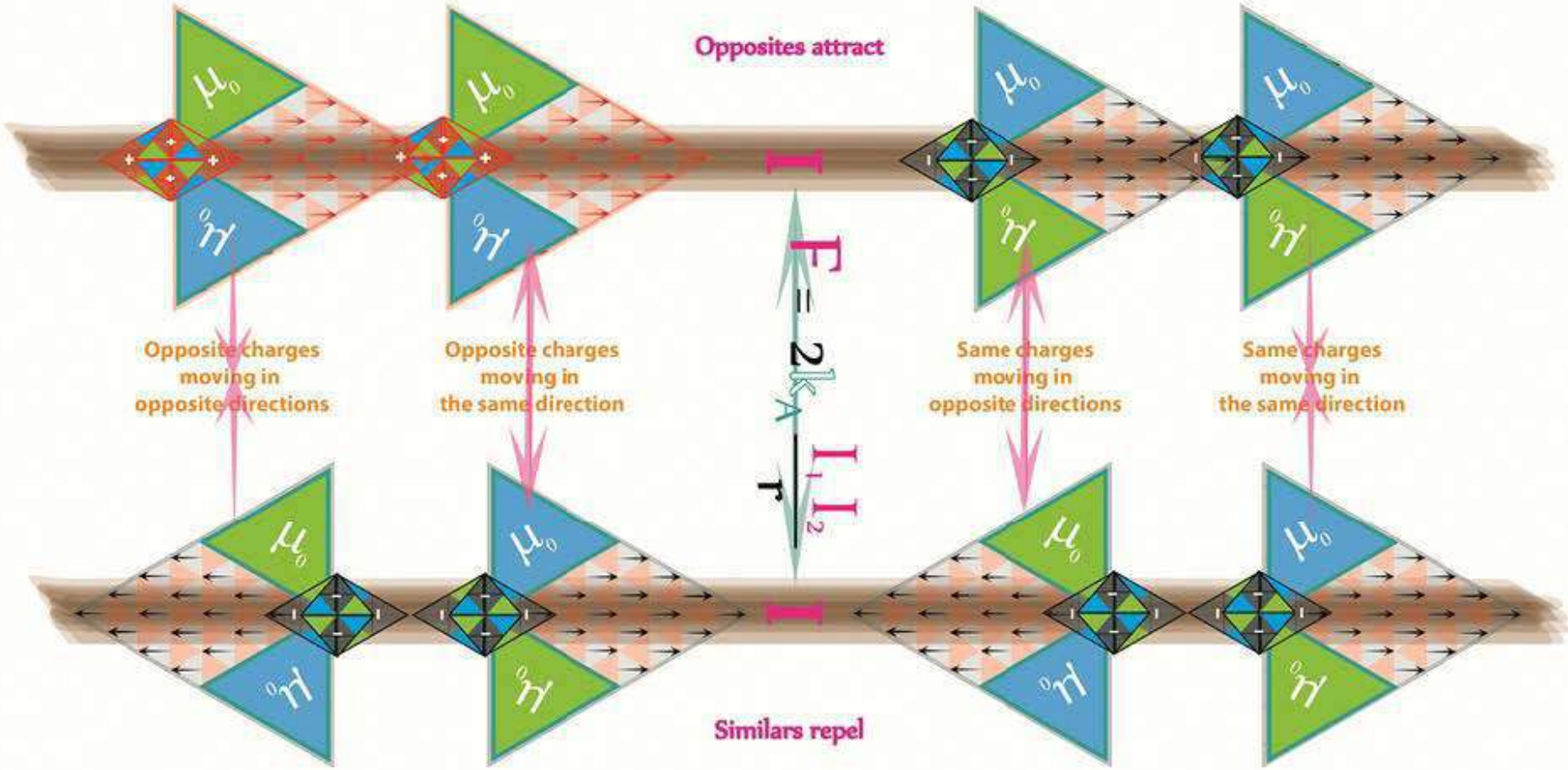
Ampere's Magnetic Interactions

the force of attraction or repulsion between two current-carrying wires (see first figure below) is often called Ampère's force law.

The best-known and simplest example of Ampère's force law, which underlies the definition of the ampere, the SI unit of current, states that the force per unit length between two straight parallel conductors is


Opposites attract
Opposite charges moving in opposite directions
Opposite charges moving in the same direction
Same charges moving in opposite directions
Same charges moving in the same direction
$F = 2k_A \frac{I_1 I_2}{r}$
Similars repel

It is a measure of the interactive force produced by the Magnetic field energy-momenta of two superpositioned KEM field geometries

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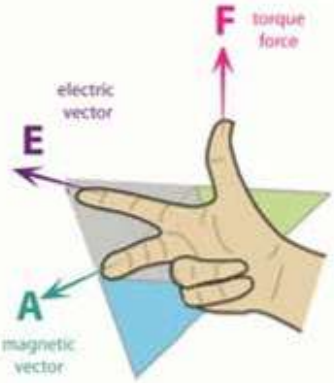
2D Electric field geometries accelerate charged particles

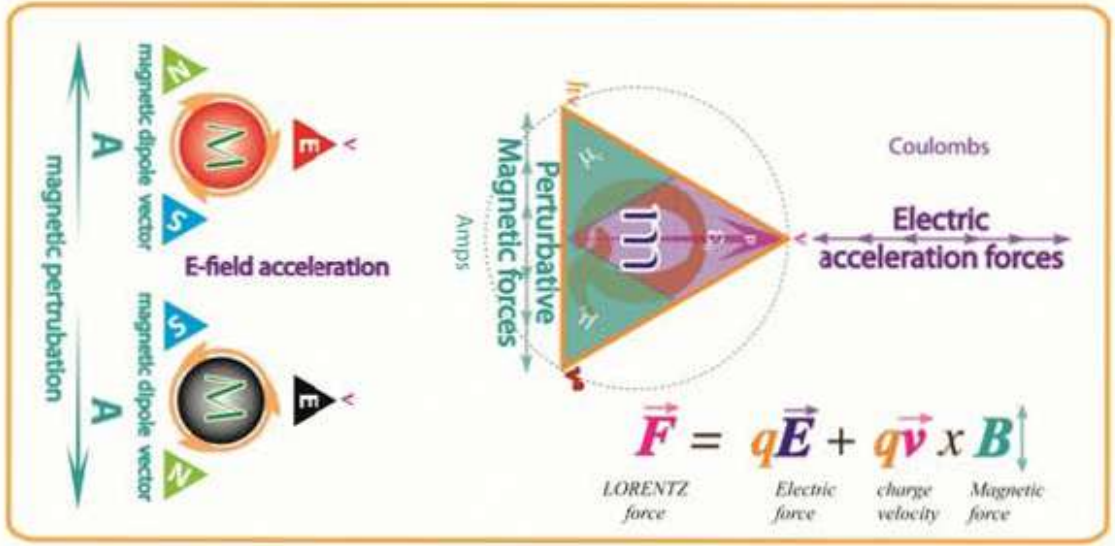
Lorentz Forces

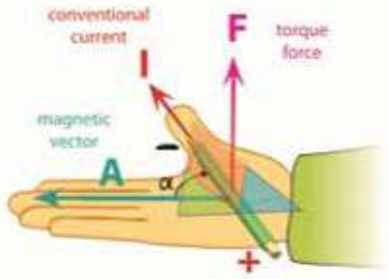
If a particle of charge q moves with velocity v in the presence of an electric field E and a magnetic field B, then it will experience a force

3D Matter topologies in motion create magnetic moments



charged particles in motion produce KEM fields with magnetic moments





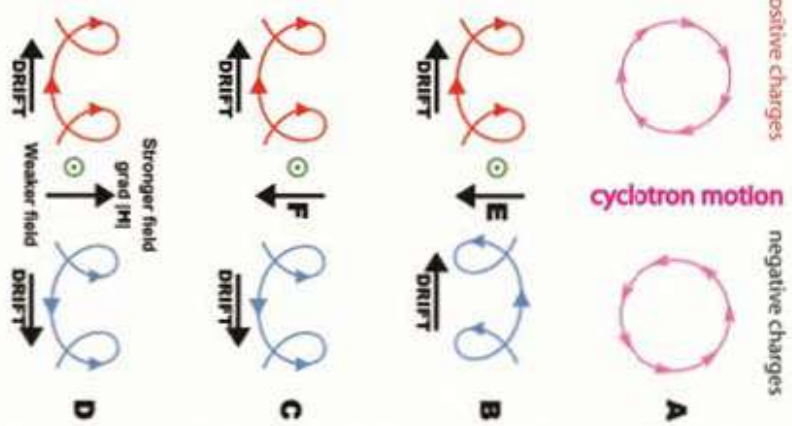
external magnetic fields create torque forces on the M dipoles of KEM fields

The Lorentz force is the force on a charged particle due to external electromagnetic fields.

Charles-Augustin de Coulomb

(14 September 1736 – 23 August 1806)

Magnetic field upwards through paper ⊙



All charges in motion are subject to external EM forces or their KEM fields

Andre Ampere

(20 January 1775 – 10 June 1836)

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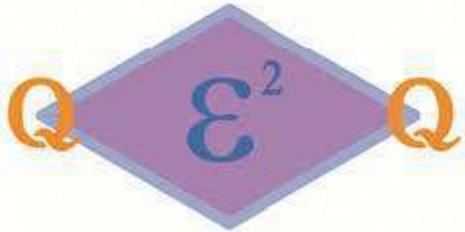
Neutral Particle interactions

Opposites Attract

Classical Forces of interaction
are unable to explain
how Neutral particles
are attracted to other particles

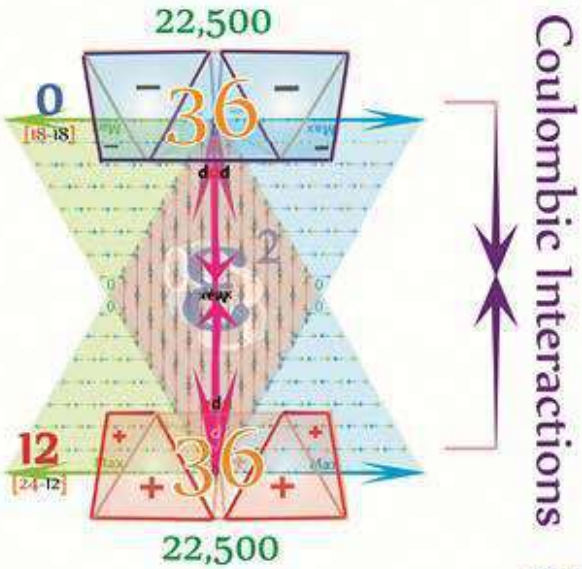
Similars Repel

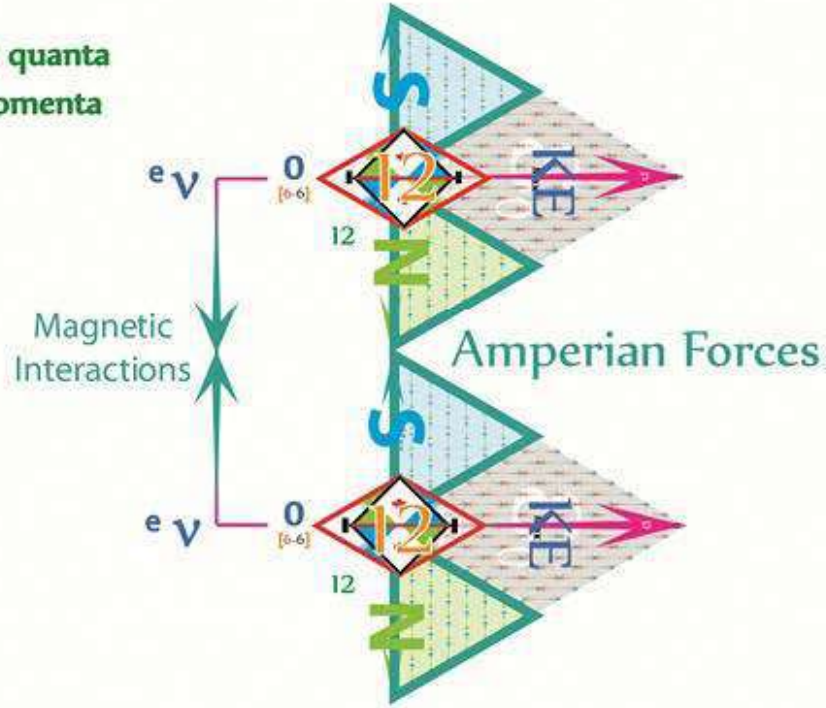
Tetryonic charge geometry



reveals the equilateral field mechanics behind
EM Induction and all the physical forces

All Matter topologies are comprised of charged mass-energy quanta that effect atomic interactions via their KEM field energy momenta





All Matter in motion produces a secondary interactive KEM field

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Coulombs

C

kg.s

mass seconds

$1\,\mathrm{C} = 1\,\mathrm{A} \cdot 1\,\mathrm{s}$

An elementary charge is 1.602216081 e-19 C

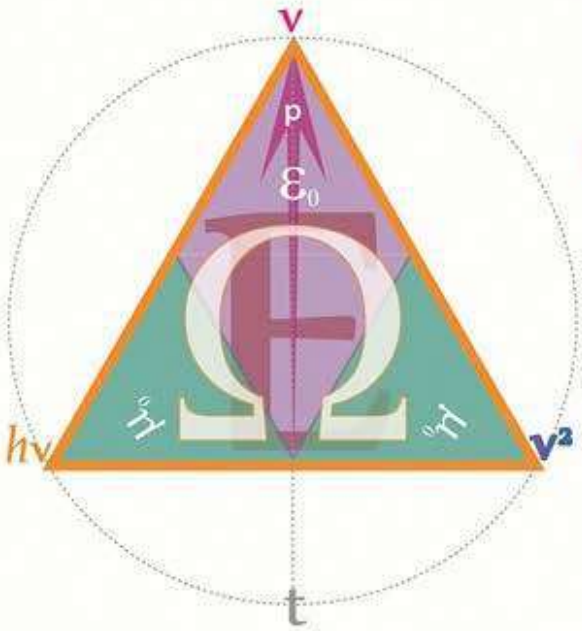
Charge is measured by the linear forces produced by the 2D equilateral geometry of mass-energy momenta

2D kEM angular mass-energy momenta

It is defined as the charge provided by a steady current of one ampere in one second.

Charged mass-Matter

All particles and fields have charged mass-energy geometries



CHARGE

One coulomb of charge flowing per second equals one ampere of current.

CURRENT

$$Q = I \,.\, t$$

Charge and Current are related to each other through time

Amperes

A

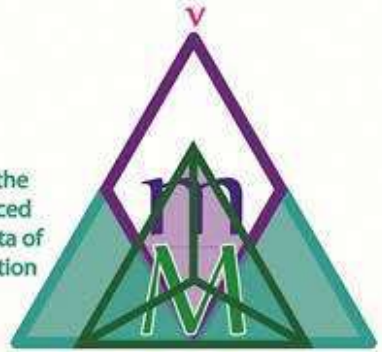
KG

mass-Matter per second

$1\,\mathrm{A} = 1\frac{\mathrm{C}}{\mathrm{s}}$

6.241355408 e18 electrons /sec constitutes one ampere.

Current is measured by the transverse forces produced by mass-energy momenta of Matter topologies in motion per unit of time



3D mass-Matter momentum

The amount of charged mass- Matter passing a point per unit time

Charge

Q

Current

I

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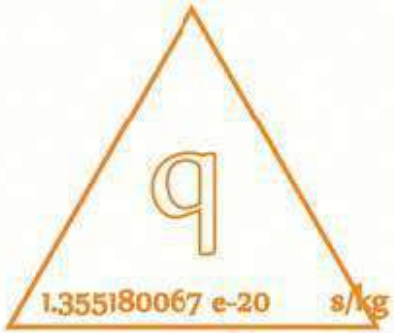
C As Charge kg.s

$C \approx kg.s \approx A$

KG $\frac{C}{s}$ Current A



Planck Charge

quantised angular momenta per scalar mass

$\frac{\Omega}{c^2}$

$\frac{E}{c^2}$

Planck mass

scalar EM energies per second

1.602216081 e-19 C

elemental charge

8.851486361 e-31 kg

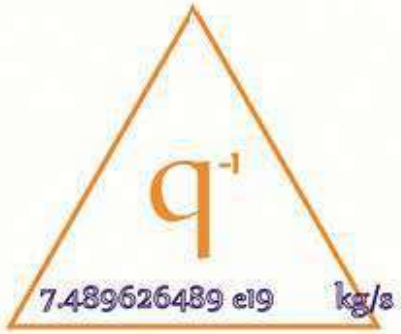
electron mass

Inverse Planck mass momenta

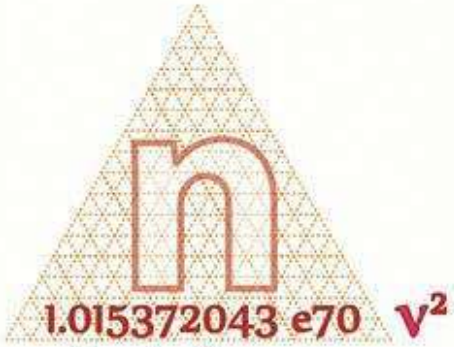
1.810109642 e30 C/kg

There exists an inverse spatial relationship between mass & charge that supports an earlier determination that quantised angular momentum [equilateral geometry] creates Charged mass-Energy-Matter

scalar mass per quantised angular momenta



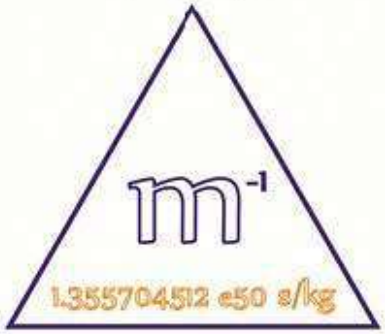
$\frac{c^2}{\Omega}$



Compton frequency

$\frac{c^2}{E}$

seconds per scalar EM energies



KG A

Fine-tuning this relationship of Planck mass-energies to quantised angular momenta at the quantum scale to equilibrium will provide an exact determination of all macroscale physical properties of mass-energy, charge, physical constants etc directly from theory

C kg.s

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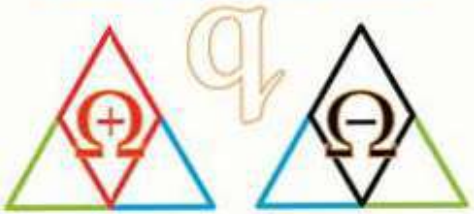
Electricity

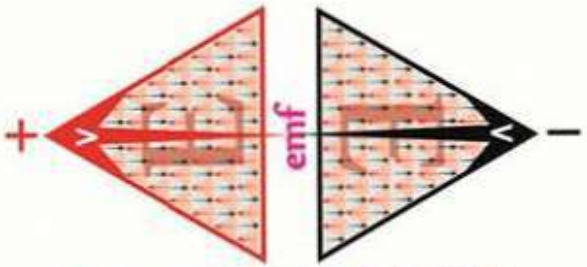
"There exists Negative and Positive electrical quanta"



Electromagnetism: a fundamental interaction between the magnetic field and the presence and motion of an electric charge topology.

Electric charge: the geometry of EM energy momenta, also determines their electromagnetic interactions.

Electrically charged Matter topologies are influenced by, and produce, electromagnetic fields when in motion



Electric potential: the capacity of an electric field to do work on an electric charge, typically measured in volts..

Benjamin Franklin

(January 17, 1706 – April 17, 1790)

Charles-Augustin_de_Coulomb
(14 September 1736 – 23 August 1806)

Andre Ampere
(20 January 1775 – 10 June 1836)

Georg Simon Ohm
(16 March 1789 – 6 July 1854)

Carl Friedrich Gauss
(30 April 1777 – 23 February 1855)

Heinrich Lenz
(February 12, 1804 – February 10, 1865)

Michael Faraday
(22 September 1791 – 25 August 1867)

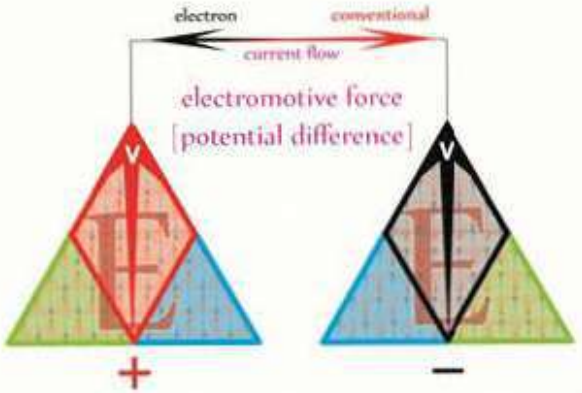
James Clerk Maxwell
(13 June 1831 – 5 November 1879)

James Prescott Joule
(24 December 1818 – 11 October 1889)

John Henry Poynting
(9 September 1852 – 30 March 1914)

Nikola Tesla
(10 July 1856 – 7 January 1943)

Electric field: an influence produced by one electric charge on other charges in its vicinity.



Electricity is the flow of Energy between separated Charge potentials when an electric circuit is formed measured in Volts [Joules/C]

Electric current: is a secondary effect resulting from electrical energy in a circuit it is the movement or flow of electrically charged particles, typically measured in amperes.

Electricity is a general term encompassing a variety of phenomena resulting from the presence and flow of electric charge. These include many easily recognizable phenomena, such as lightning, static electricity, and the flow of electrical current in an electrical wire. In addition, electricity encompasses less familiar concepts such as the electromagnetic field and electromagnetic induction.

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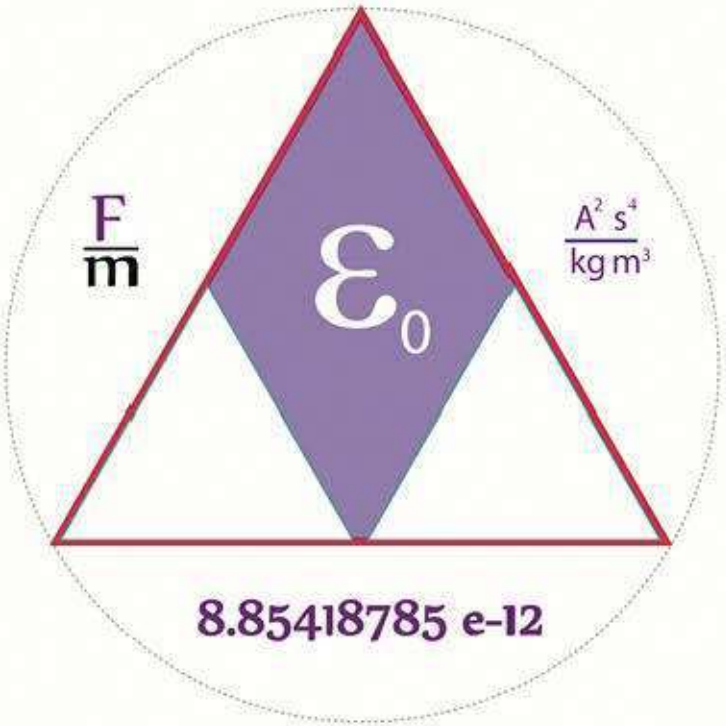
EM field Permittivity

The Electric constant, commonly called the vacuum permittivity, or permittivity of free space, relates the units for electric charge to mechanical quantities such as length and force.

The name Vacuum Permittivty is a misnomer and should be replaced with the correct term EM field Permittivity

The strength of Electric fields is determined by the Electrical Permittivity Constant

$$E = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}$$

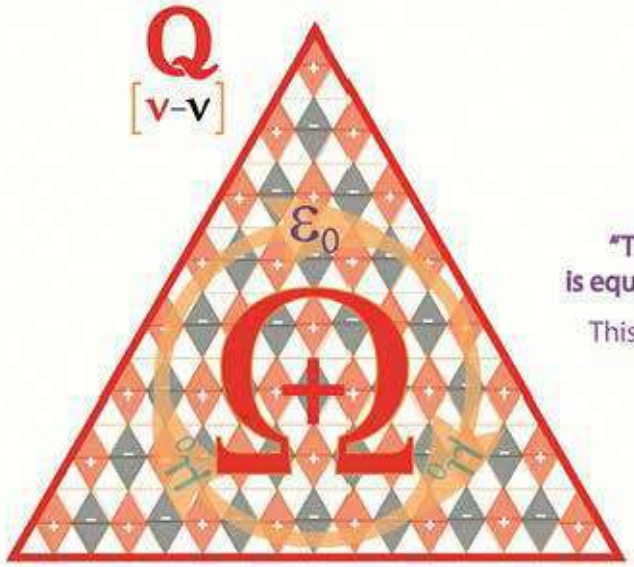


The permittivity of empty space, equal to 1 in centimeter-gram-second electrostatic units and to 107/4πc2 farads per meter or, numerically, to 8.854 × 10-12 farad per meter in International System units, where c is the speed of light in meters per second.

$$\varepsilon_0 = \frac{1}{\mu_0 c^2}$$

"Ampere's Law states that for any closed loop path, the sum of the quantities (B.ds) for all path elements into which the complete loop has been divided is equal to the product of μ0 and the total current enclosed by the loop."

$$k = \frac{1}{4\pi\varepsilon_0}$$



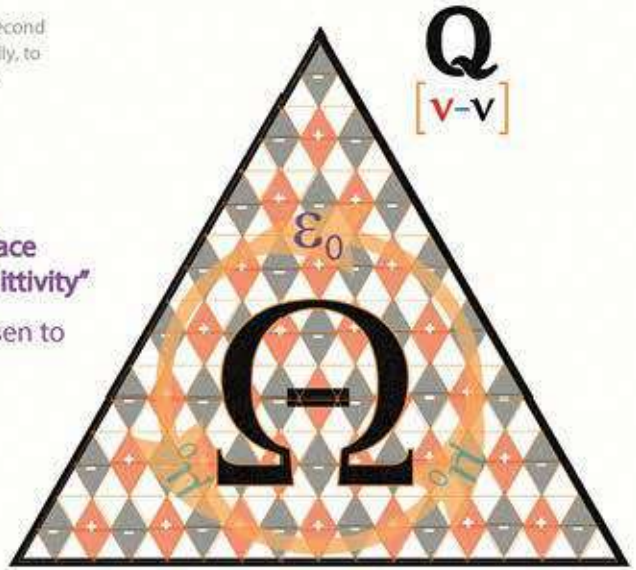
Positive Charge Electric Field

Gauss' Law:

"The total of the electric flux out of a closed surface is equal to the charge enclosed divided by the permittivity"

This applies equally to any integral geometry chosen to tessellate a surface area

Superpostioned E fields gives rise to Coulomb Forces



Negative Charge Electric Field

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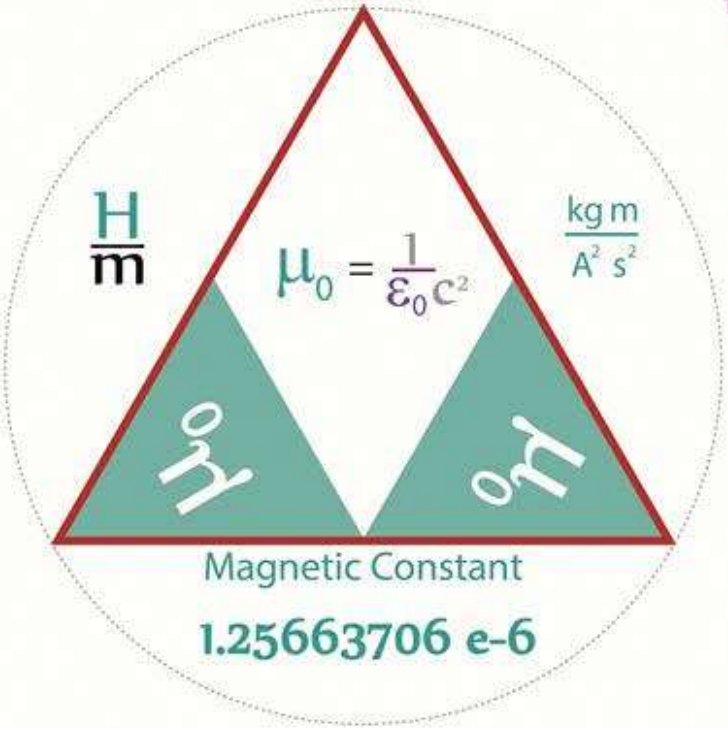
EM field Permeability

The permeability of free space,
also called absolute permeability.

The name Vacuum Permeability is a misnomer and should be replaced with the correct term EM field Permeability

The magnetic constant has the value of
$4\pi \times 10\text{-}7$ henry per meter.

The strength of Magnetic fields is determined by the Magnetic Permeability Constant



μ_0

The magnetic field is most commonly defined in terms of the Lorentz force it exerts on moving electric charges.

F

The magnetic field generated by a steady current (a constant flow of electric charges in which charge is neither accumulating nor depleting at any point) as described by the Biot–Savart law

$B=\mu_0 H$

Positive Magnetic Moment

Magnetic monopoles do NOT exist

they are a mathematical identity
and not physically possible due to
the equilateral geometry
of Planck energies

Negative Magnetic Moment

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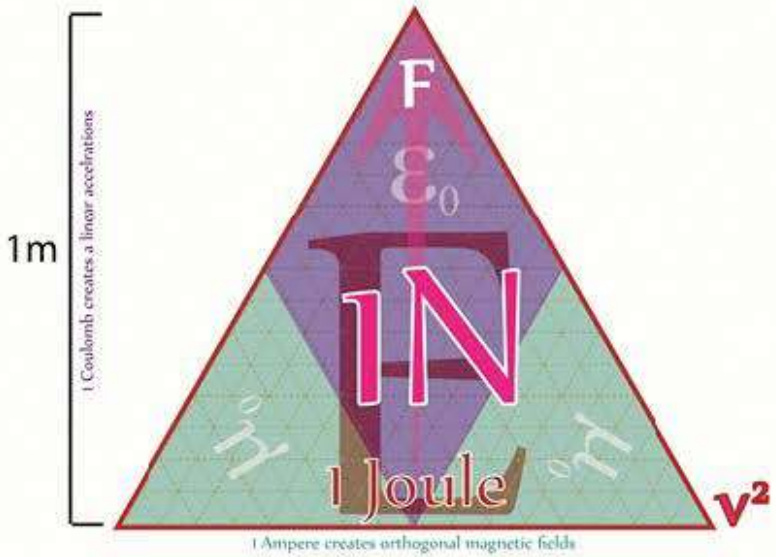
James Prescott Joule

(24 December 1818 – 11 October 1889)



Joule

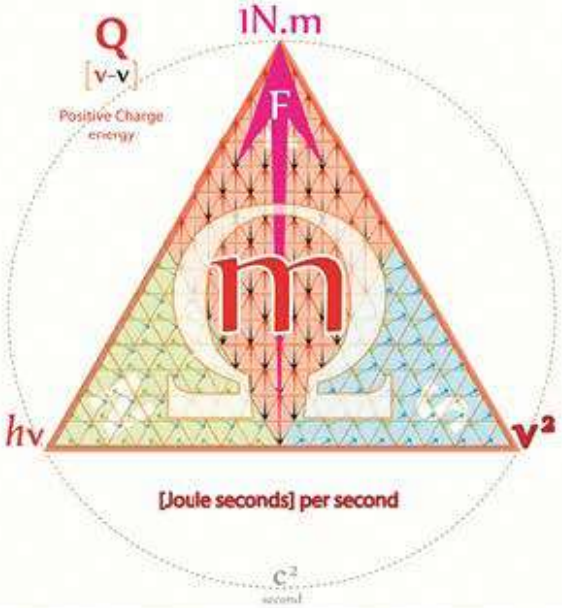
A measure of the equilateral charged mass-energy momenta that can to do work

... the mechanical power exerted in turning a magneto-electric machine is converted into the heat evolved by the passage of the currents of induction through its coils; and, on the other hand, that the motive powe: of the electro-magnetic engine is obtained at the expense of the heat due to the chemical reactions of the battery by which it is worked (1845)

$$n\pi \left[\left[\varepsilon_0 \mu_0 \right] . \left[m \Omega v^2 \right] \right]$$

mass; EM Field; ElectroMagnetic; Planck quanta; mass; velocity

It is equal to the energy expended (or work done) in applying a force of one newton through a distance of one meter (1 newton metre or N·m), or in passing an electric current of one ampere through a resistance of one ohm for one second



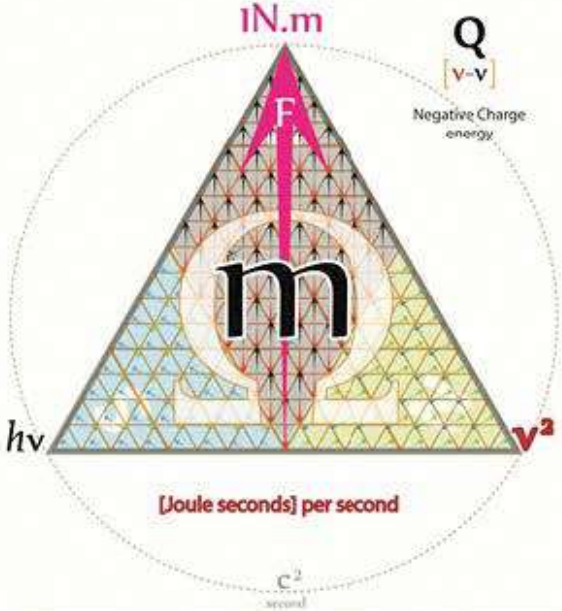
Energy $kg.\frac{m^2}{s^2}$

$$J = \frac{kg \cdot m^2}{s^2} = N \cdot m = Pa \cdot m^3 = W \cdot s$$

Planck's Constant x frequency $\left[kg.\frac{m^2}{s}\right].s^{-1}$

mass x velocity squared $kg.\left[\frac{m}{s}\right]^2$

Momentum x velocity $\left[kg.\frac{m}{s}\right].\frac{m}{s}$



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Volts

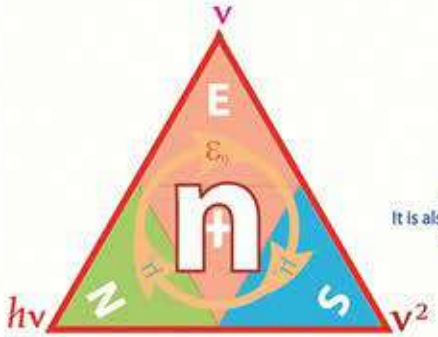
[Joules per Coulomb]

The volt is the unit for electric potential (voltage), electric potential difference, and electromotive force.

$$V = \frac{W}{A} = \frac{J}{A \cdot s} = \frac{N \cdot m}{A \cdot s} = \frac{kg\,m^2}{A\,s^3} = \frac{kg \cdot m^2}{C \cdot s^2} = \frac{N \cdot m}{C} = \frac{J}{C}$$

A single volt is defined as the difference in electric potential across a wire when an electric current of one ampere dissipates one watt of power.
It is also equal to the potential difference between two parallel, infinite planes spaced 1 meter apart that create an magnetic field of 1 newton per coulomb.
Additionally, it is the potential difference between two points that will impart one joule of energy per coulomb of charge that passes through it

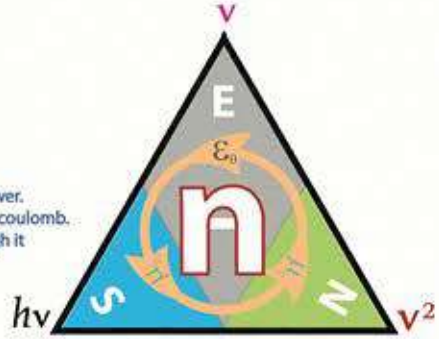
Positive charge



1V = 1J/C

One Volt is defined as energy consumption of one joule per electric charge of one coulomb

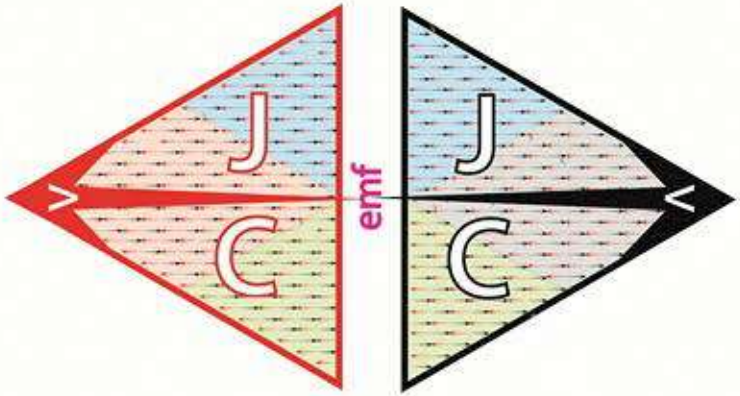
Negative charge



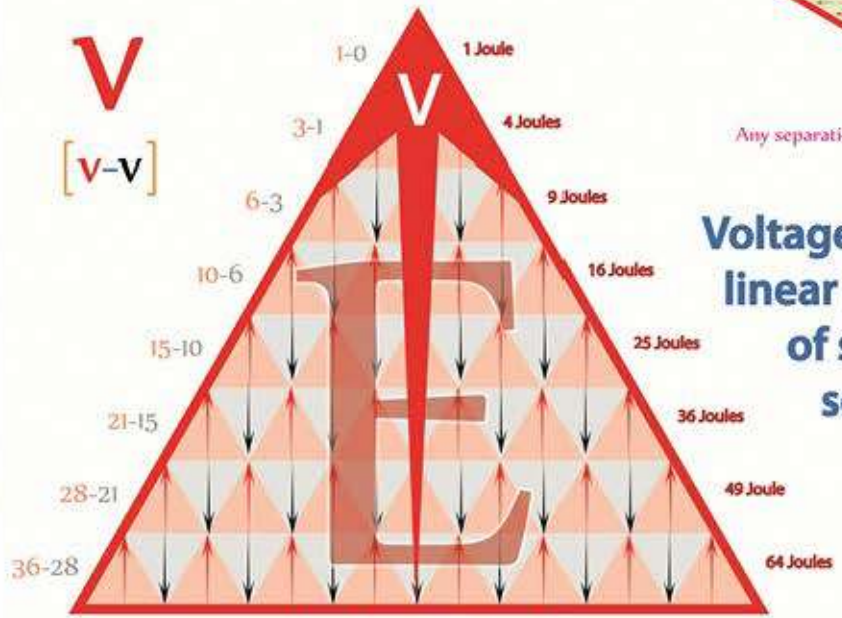
1V = 1A · 1ohm

One volt is equal to current of 1 amp times resistance of 1 ohm

Positive voltage

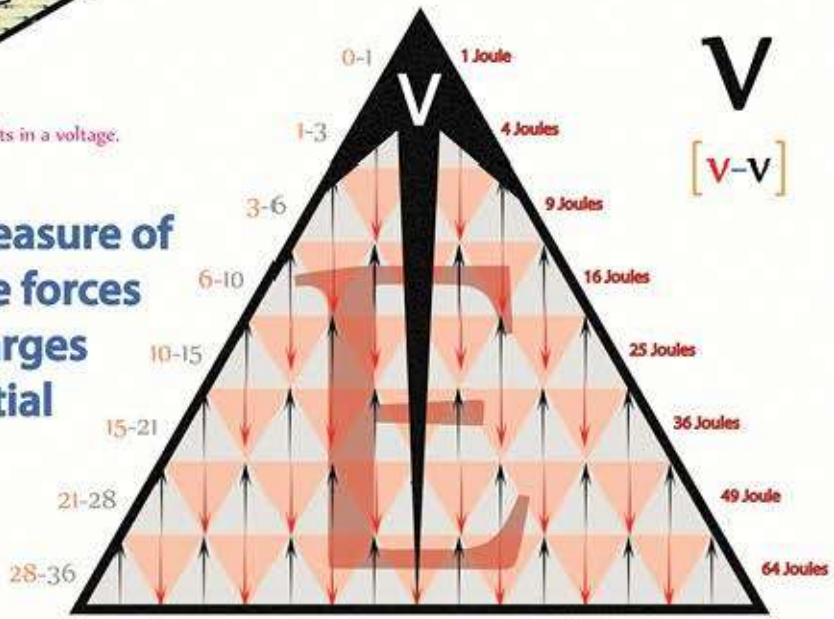


Negative voltage



Any separation of electrostatic charges, results in a voltage.
[Potential Difference]

Voltage is a scalar measure of linear electromotive forces of separated charges seeking potential equilibrium



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Positive charged mass-energy

1
[1-0]

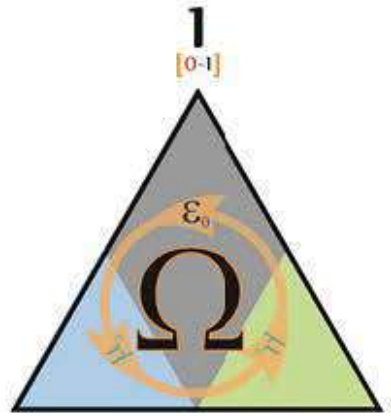
Clockwise inductive energy flux

Charge is the equilateral geometry of Energy that gives form to all mass & Matter

charge time

Negative charged mass-energy

1
[0-1]



Counter clockwise energy flux

q

$$\frac{\Omega}{c^2}$$

$$\frac{m^2}{s}\frac{s^2}{m^2}$$

s
seconds

q

t t

ElectroMagnetic Charge is a quantum property resulting from the equilateral QAM geometry of mass-Energy

1.33518 e-20 s

Changes to nett quantised angular momenta [charged mass-energies] within any space-time co-ordinate system forms the basis of time

The two ElectroMagnetic charge geometries possible can be created through tesselation of electrical energy in ideal inductive loops

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Coulombs

are a measure of 2D charged mass geometries
and the electromagnetic forces they produce per unit time

W+ boson integrals
nett positive charged
mass momenta

Q
[v-v]

Charles-Augustin de Coulomb

(14 September 1736 – 23 August 1806)

Derived in 1785 Coulomb's Law is a law of physics describing the electrostatic interaction between any two charged particles (and forms the basis for Ampere's Law)

Q
[v-v]

W- boson integrals
nett negative charged
mass momenta

Electric forces

$$m\frac{\Omega}{c^2}$$

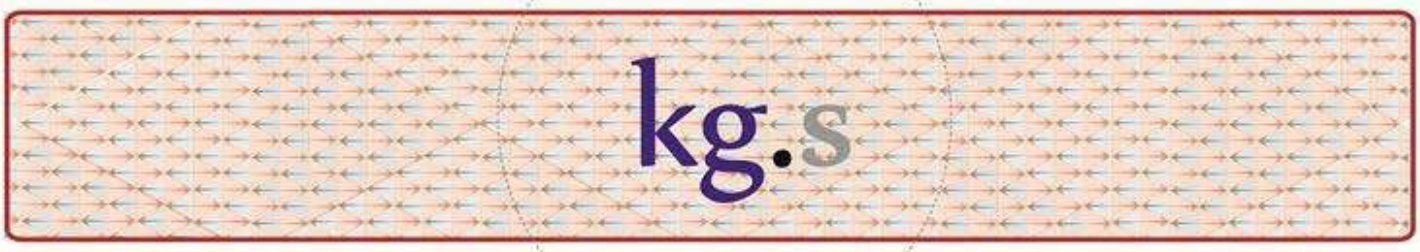
Magnetic forces

Coulombs

The coulomb (unit symbol: C) is the SI derived unit of electric charge (symbol: Q or q).
It is defined as the charge transported by a steady current of one ampere in one second:

Amperes

As



$\frac{C}{s}$

Interactive linear momenta of super-positioned E-fields creates Coulomb's force law

1A.1s

c²
sec

1F.1V

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$1C = 1A \cdot 1s$

1 COULOMB is a measure of linear 2D electric field energy momenta in EM field geometries

1 AMPERE is a measure of orthogonal 2D magnetic field forces produced by Matter topologies in motion

$1A = 1\frac{C}{s}$

C

quantised electrical energy momenta

1C is the quantity of charged masses which pass any point in a circuit in which a current of 1A flows for 1s

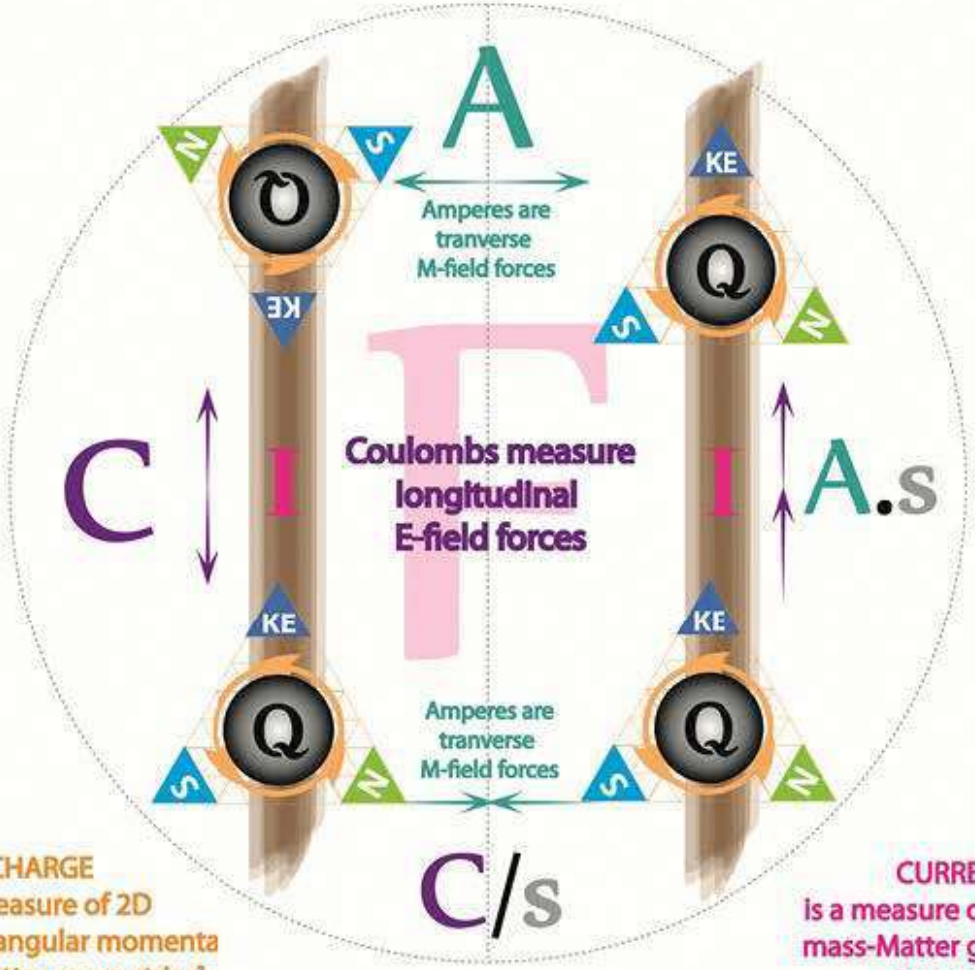
A

Coulombs

Amperes

kg.s

KG



linear acceleration energy momenta

magnetic perturbation energy momenta

Q

CHARGE is a measure of 2D quantised angular momenta [mass -Matter geometries]

CURRENT is a measure of charged mass-Matter geometries in motion

I

Charge

$Q = I.t$

quantity of charge = rate of flow of charge x time

Current

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Current

is a measure of charged Matter in motion in a circuit per unit of Time

An elementary charge is
1.602216081 e-19 C

C

Coulombs

It is defined as the charge transported by a steady current of one ampere in one second.

I

Amperes

The amount of electric charge passing a point per unit time

A

6.2413354 e18 electrons passing a given point each second constitutes one ampere.

charged masses

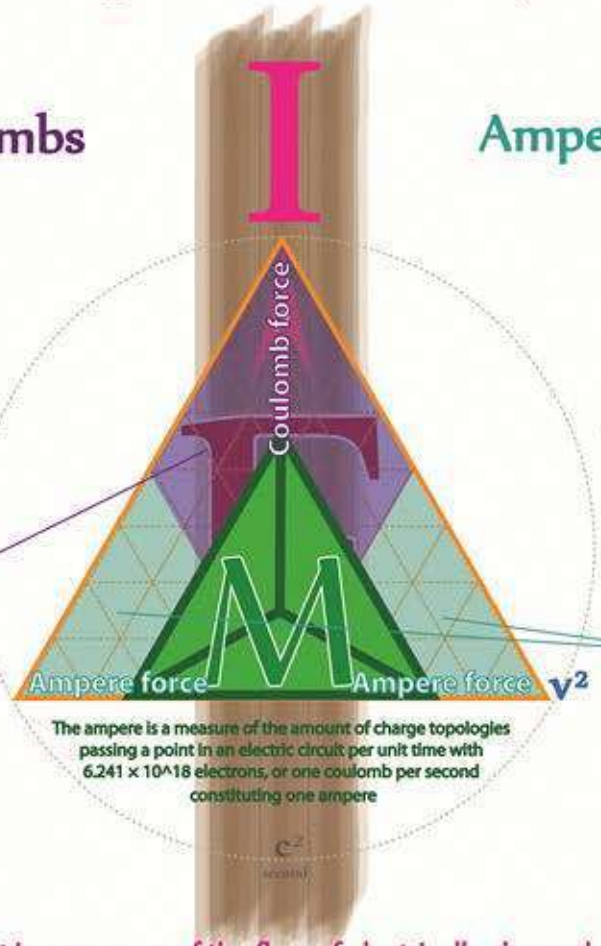
kg.s

1.33518 e-20 kg.s

7.489626 e19 kg

Matter

KG



The 2D linear mass-energy momenta capable of accelerating charged particles

The transverse magnetic forces produced by Matter in motion

The ampere is a measure of the amount of charge topologies passing a point in an electric circuit per unit time with 6.241 x 10^18 electrons, or one coulomb per second constituting one ampere

$1C = 1A \cdot 1s$

Electric current is a measure of the flow of electrically charged mass-Matter in a circuit as a result of an electrical Voltage potential

$1\,A = 1\frac{C}{s}$

As

5.524527227 e-12 kg

Charged mass — 1 second — Matter in motion

6.241355408 e18 electrons

$\frac{C}{S}$

Voltage [emf] is a measure of the energy momenta per coulomb available to exert a force on charged Matter in a circuit

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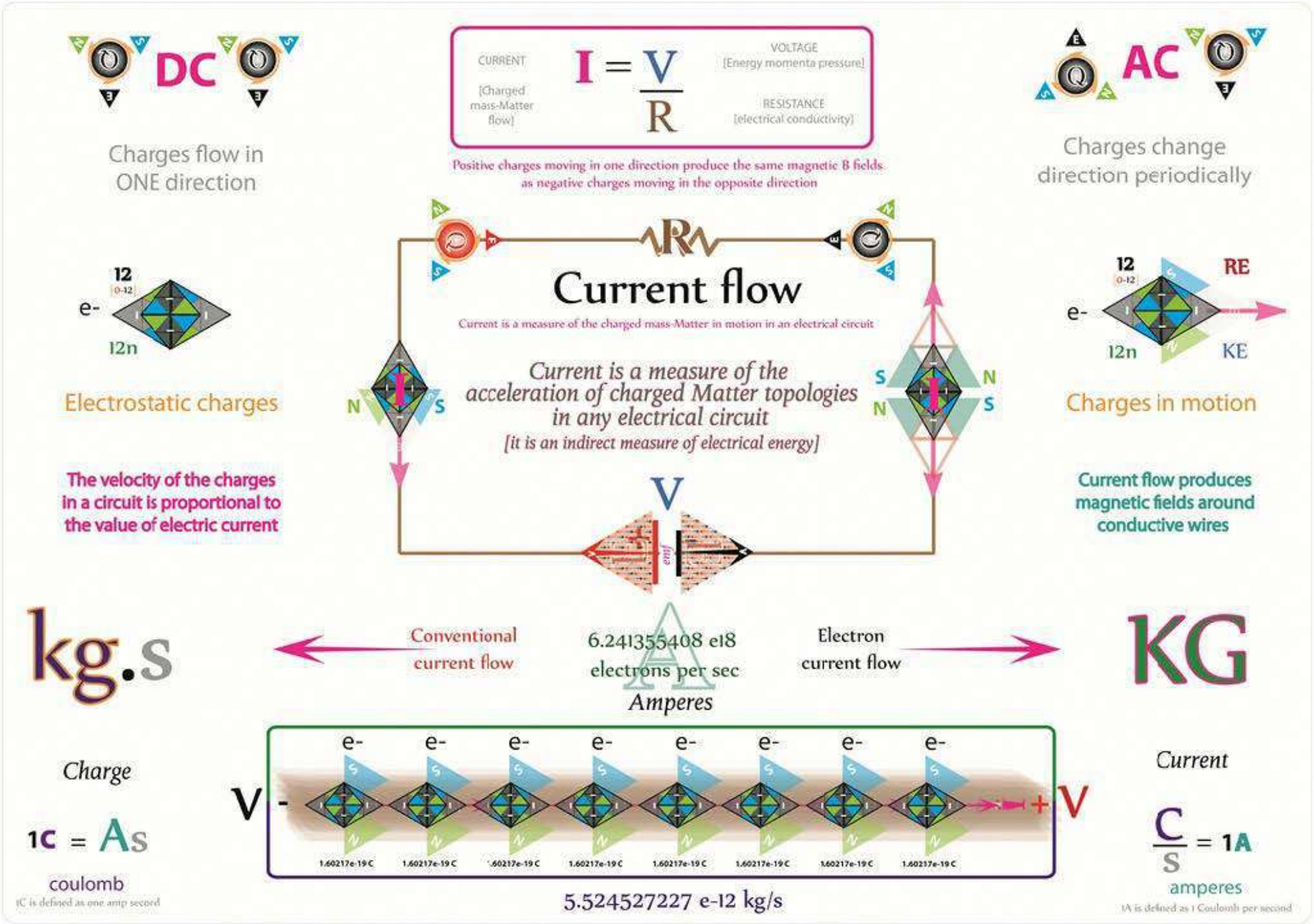

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The electrical resistance of a conductor is a measure of how much it opposes the passage of an electric current through it

OHM's Law

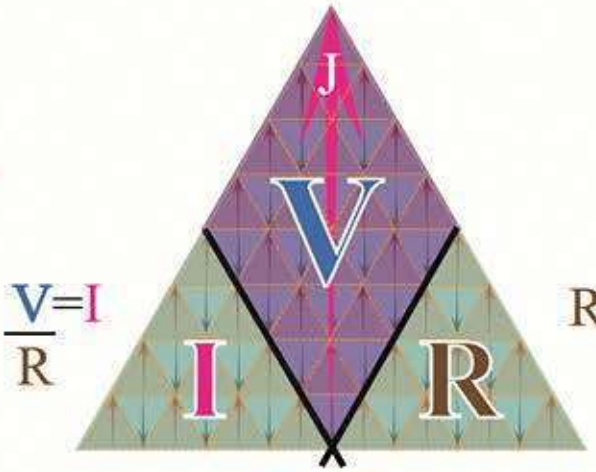
Georg Simon Ohm

(16 March 1789 – 6 July 1854)

$$\mathcal{E} = \rho J$$

Electric field — resistivity — Current density

General vector equation



$$\frac{V}{R} = I \qquad R = \frac{V}{I}$$

$$V = I.R$$

$$P = I.V = I^2.R$$

Power is the amount of current times the voltage level at a given point measured in watts.

Current is the flow of charged mass-Matter resulting from an electromotive force

Resistance determines how much current will flow through a conductor

Current [I.V] Voltage
POWER
Current squared [I^2R] Resistance

Ohm's law states that the current through a conductor between two points is directly proportional to the potential difference across the two points.

By introducing the constant of proportionality, Resistance, one arrives at the usual mathematical equation that describes this relationship

Voltage is the force motivating charges to "flow" in a circuit, it is measured as the difference in electrical potential between two points in a circuit

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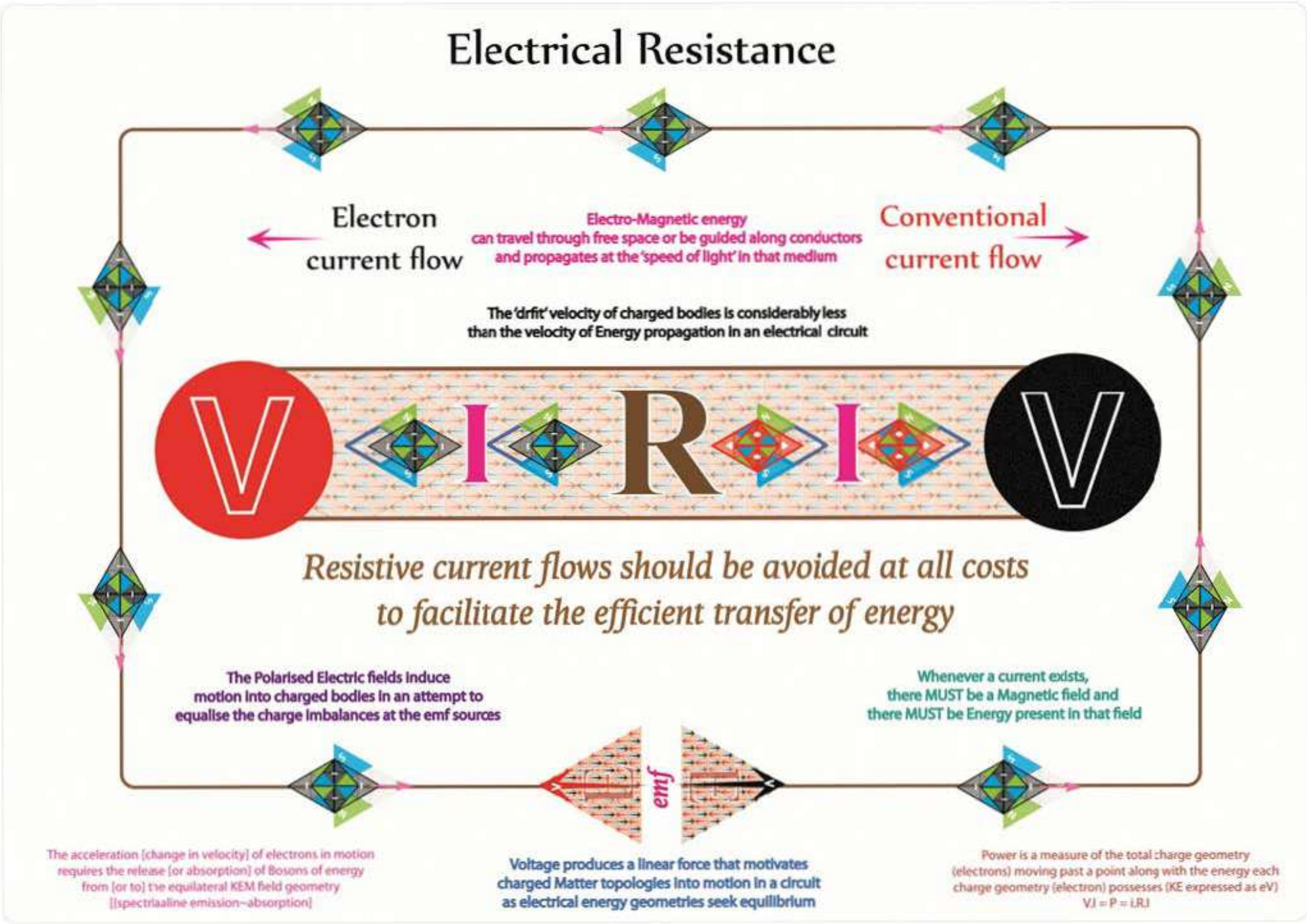
Electrical Resistance


Electron current flow
Electro-Magnetic energy can travel through free space or be guided along conductors and propagates at the 'speed of light' in that medium
Conventional current flow
The 'drfit' velocity of charged bodies is considerably less than the velocity of Energy propagation in an electrical circuit
V I R I V
Resistive current flows should be avoided at all costs to facilitate the efficient transfer of energy
The Polarised Electric fields Induce motion into charged bodies in an attempt to equalise the charge imbalances at the emf sources
Whenever a current exists, there MUST be a Magnetic field and there MUST be Energy present in that field
emf
The acceleration (change in velocity) of electrons in motion requires the release (or absorption) of Bosons of energy from (or to) the equilateral KEM field geometry [(spectrlaaline emission~absorption]
Voltage produces a linear force that motivates charged Matter topologies into motion in a circuit as electrical energy geometries seek equilibrium
Power is a measure of the total charge geometry (electrons) moving past a point along with the energy each charge geometry (electron) possesses (KE expressed as eV)
V.I = P = I.R.I

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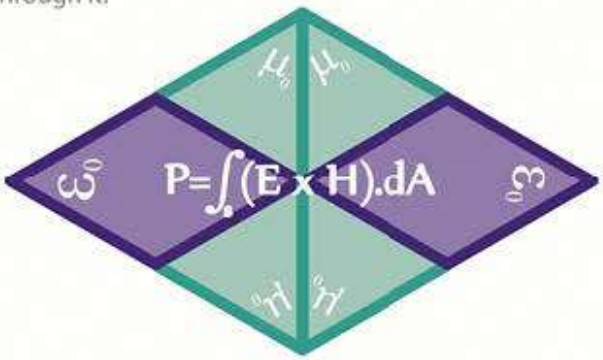
James Prescott Joule verified Ohm's Law and determined that the heat delivered by a conductor is directly proportional to its resistance and to the square of the current through it.

He defined Power physically to be the rate at which electrical energies are created or transferred in an electric circuit

All energy is comprised of 2D charged masses

Electrical Power

Power is the integral of the cross-product of all electrical and magnetic field vectors produced by scalar energy momenta within a specific area defined by time



The scalar surface integral of the Poynting vector.

The SI unit of power is the watt, one joule per second.

Electrical power flows wherever Electric and Magnetic fields exist together and change over time

Electrical power propagates at the speed of light in an electrical circuit [dependent on the voltage source] electrons have a vastly slower 'drift' velocity resulting from their inertial interaction with energy momenta of the Voltage [emf] field

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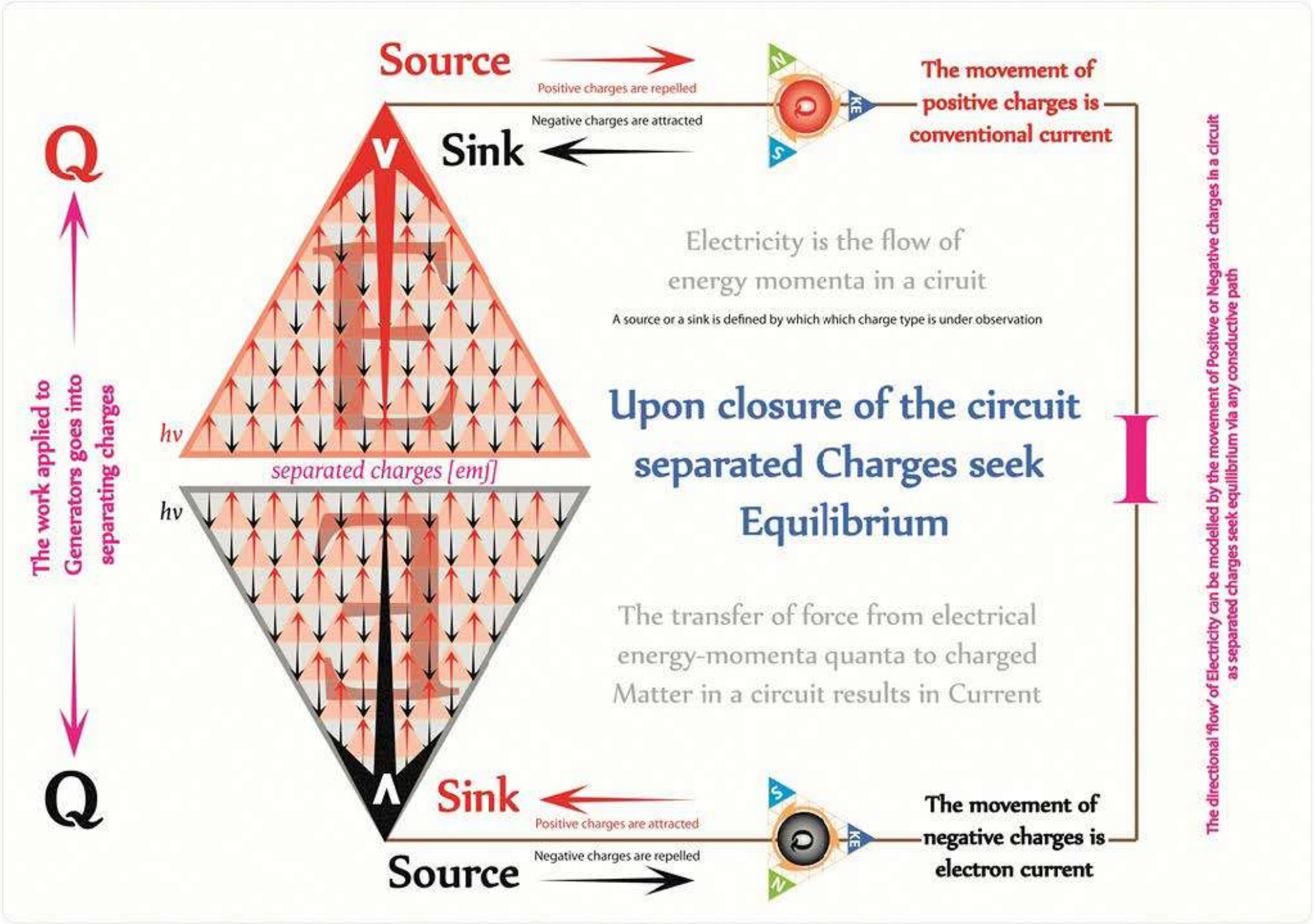
Source
Positive charges are repelled
Negative charges are attracted
Sink
The movement of positive charges is conventional current
Q
The work applied to Generators goes into separating charges
Q
hν
separated charges [emf]
hν
Electricity is the flow of energy momenta in a ciruit
A source or a sink is defined by which which charge type is under observation
Upon closure of the circuit separated Charges seek Equilibrium
The transfer of force from electrical energy-momenta quanta to charged Matter in a circuit results in Current
I
The directional 'flow' of Electricity can be modelled by the movement of Positive or Negative charges in a circuit as separated charges seek equilibrium via any consductive path
Sink
Positive charges are attracted
Negative charges are repelled
Source
The movement of negative charges is electron current

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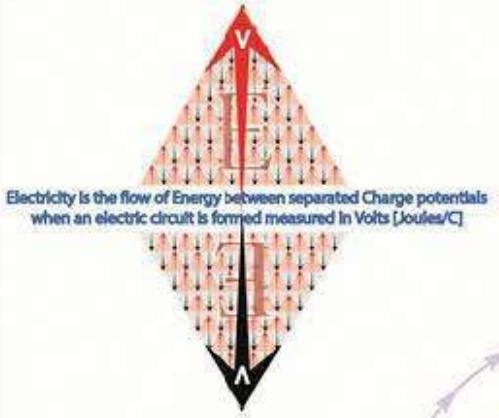
EM Inductive circuits



Electricity is the flow of Energy between separated Charge potentials when an electric circuit is formed measured in Volts [Joules/C]

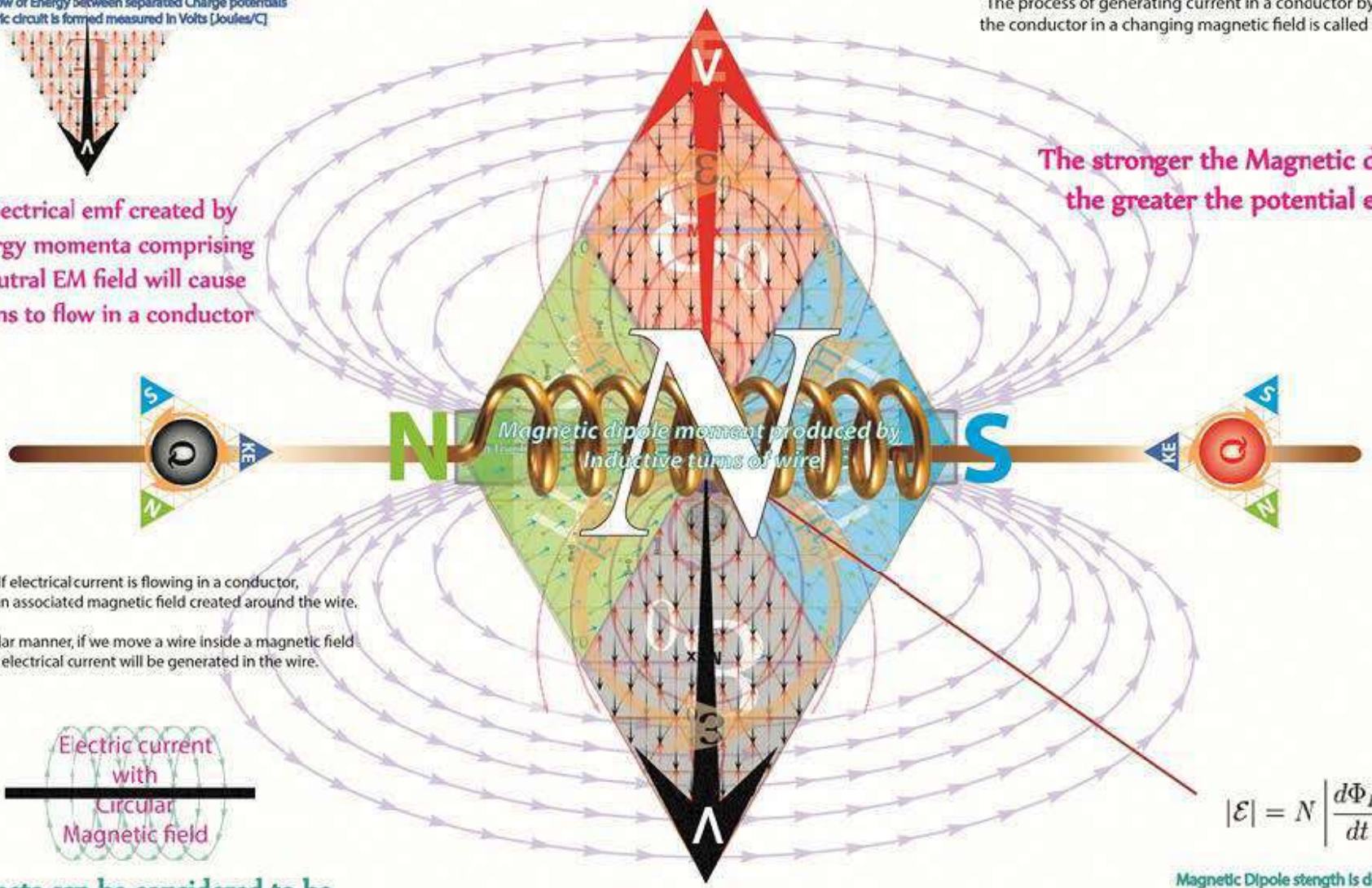
The Electrical emf created by the energy momenta comprising the neutral EM field will cause electrons to flow in a conductor

Neutral Electric field with Magnetic dipole

Current is produced in a conductor when it is moved through a magnetic field because the neutralised Electric field lines are applying a emf on the free electrons in the conductor and causing them to move.

The process of generating current in a conductor by placing the conductor in a changing magnetic field is called induction

The stronger the Magnetic dipole the greater the potential emf



If electrical current is flowing in a conductor, there is an associated magnetic field created around the wire.

In a similar manner, if we move a wire inside a magnetic field an electrical current will be generated in the wire.

Magnets can be considered to be static stores of potential [emf fields]

Magnetic DIpole with Neutral Electric field

$$|\mathcal{E}| = N\left|\frac{d\Phi_B}{dt}\right|$$

Magnetic DIpole stength is dependent on:

The total Number of turns in the Inductor & the current flowing through the circuit

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Electron Volts

The electron volt can also be used as a unit of mass-energy by applying Einstein's relation $E = mc^2$.

For example, the rest mass-energy of electron topologies if 496,532 eV (496.532 MeV).

Chemically, for 1 mole of electrons
1 eV ~ 100 kJ mol-1 (96.49 kJ mol-1)

eV

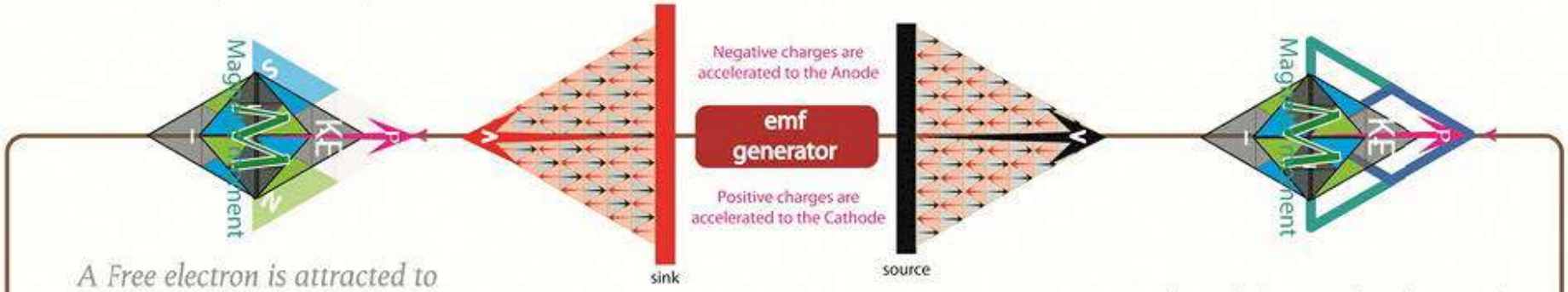
A unit of energy
equal to the work required to move
one electron through a potential
difference of 1 volt.

An Electron Volt is also
a measure of Electrical Kinetic Energy

$$\frac{1}{2}\left[4\pi\underset{\text{Tetryons}}{}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]\right]$$

(EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

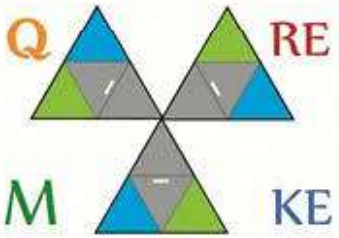
As distinct from Matter's ENERGY
Kinetic Energy is 'extended from the
Tetryonic geometry of all Matter in motion
in a separate 2D KEM field



A Free electron is attracted to Positive anode of an emf source

The application of UFE to Kinetic energy calculations reveals the underlying processes of the Photo-electric effect and Light-Energy interactions with respect to Kinetic energy

Accelerated electrons have increased KE, Magnetic moments & momentum

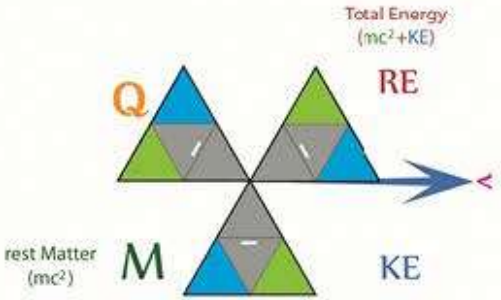


$$12\pi\underset{\text{Fermions}}{}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

$$\frac{P^2}{2m} = KE = \frac{1}{2}Mv^2$$

By definition, it is equal to the amount of kinetic energy momenta gained by a single unbound electron when it accelerates through an electric potential difference of one volt.



(Total Energy = Absolute rest Matter + Kinetic energy)
additionally the Lorentz relativistic correction factor (β)
presents itself naturally from the UFE when velocity is applied

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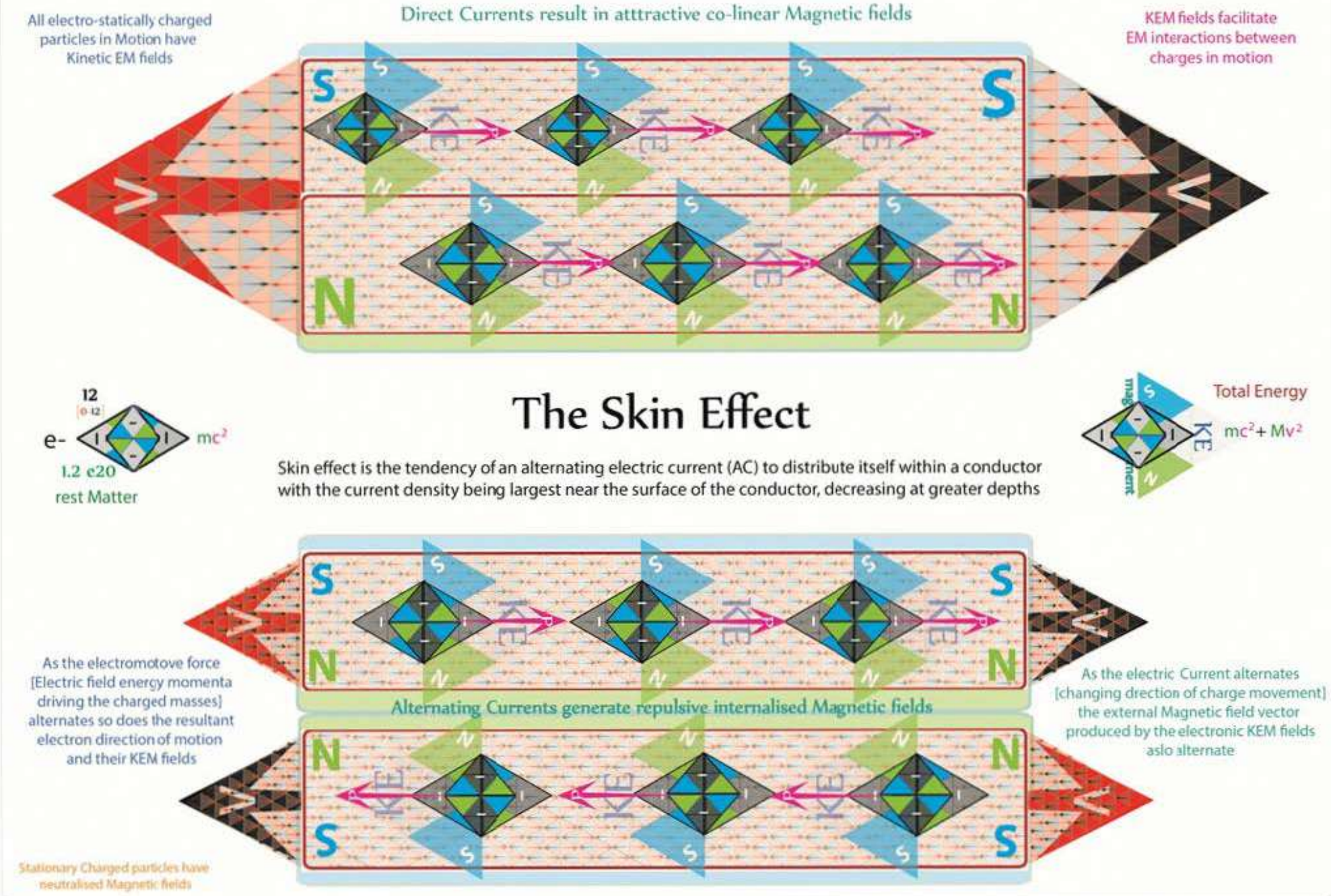
The Skin Effect

Skin effect is the tendency of an alternating electric current (AC) to distribute itself within a conductor with the current density being largest near the surface of the conductor, decreasing at greater depths


All electro-statically charged particles in Motion have Kinetic EM fields
Direct Currents result in atttractive co-linear Magnetic fields
KEM fields facilitate EM interactions between charges in motion
S
N
V
KE
12
e-
mc²
1.2 e20
rest Matter
Total Energy
mc²+ Mv²
magnetic
KE
Alternating Currents generate repulsive internalised Magnetic fields
As the electromotove force [Electric field energy momenta driving the charged masses] alternates so does the resultant electron direction of motion and their KEM fields
As the electric Current alternates [changing drection of charge movement] the external Magnetic field vector produced by the electronic KEM fields aslo alternate
Stationary Charged particles have neutralised Magnetic fields

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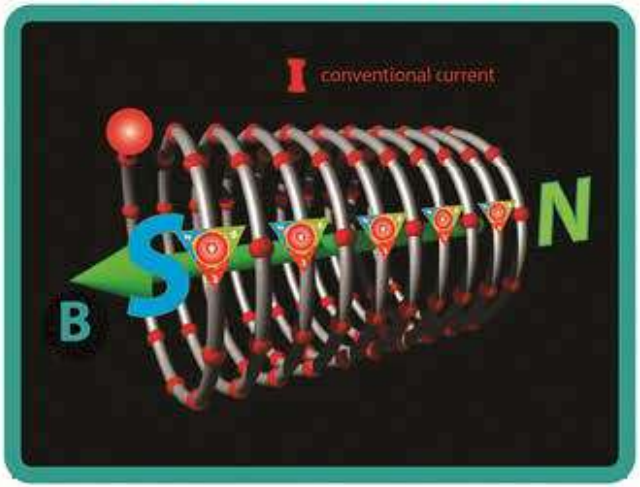
EM fields of particles in Motion

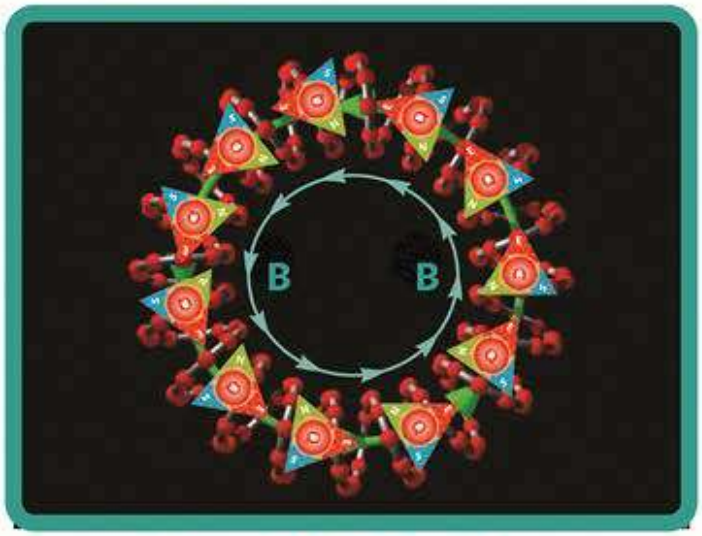
Positive changed quanta traveling anti-clockwise in a solonoid creates a North-South magnetic field orientated in the direction shown

Negative charged quanta create a reversed Magnetic dipole field and reversing the direction of particle motion also reverses the magnetic vector

Solenoidal Motion



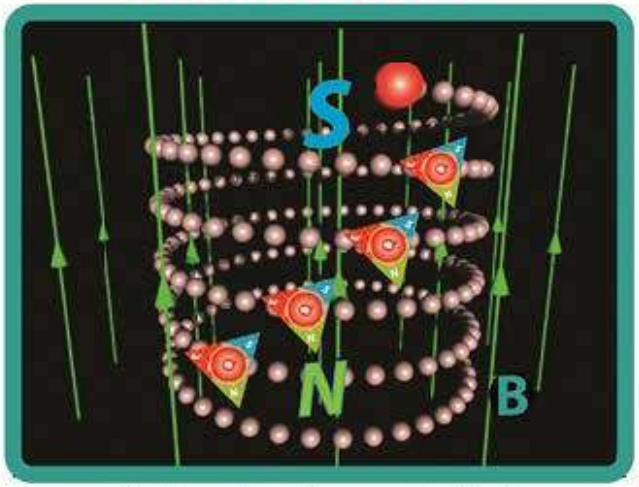
Charged particles moving in a spiral produce a Circular Magnetic field



Toroidal Motion

A toroidally wound conductor produces a Circular Magnetic field

Helical Motion



Motion in a Magnetic field

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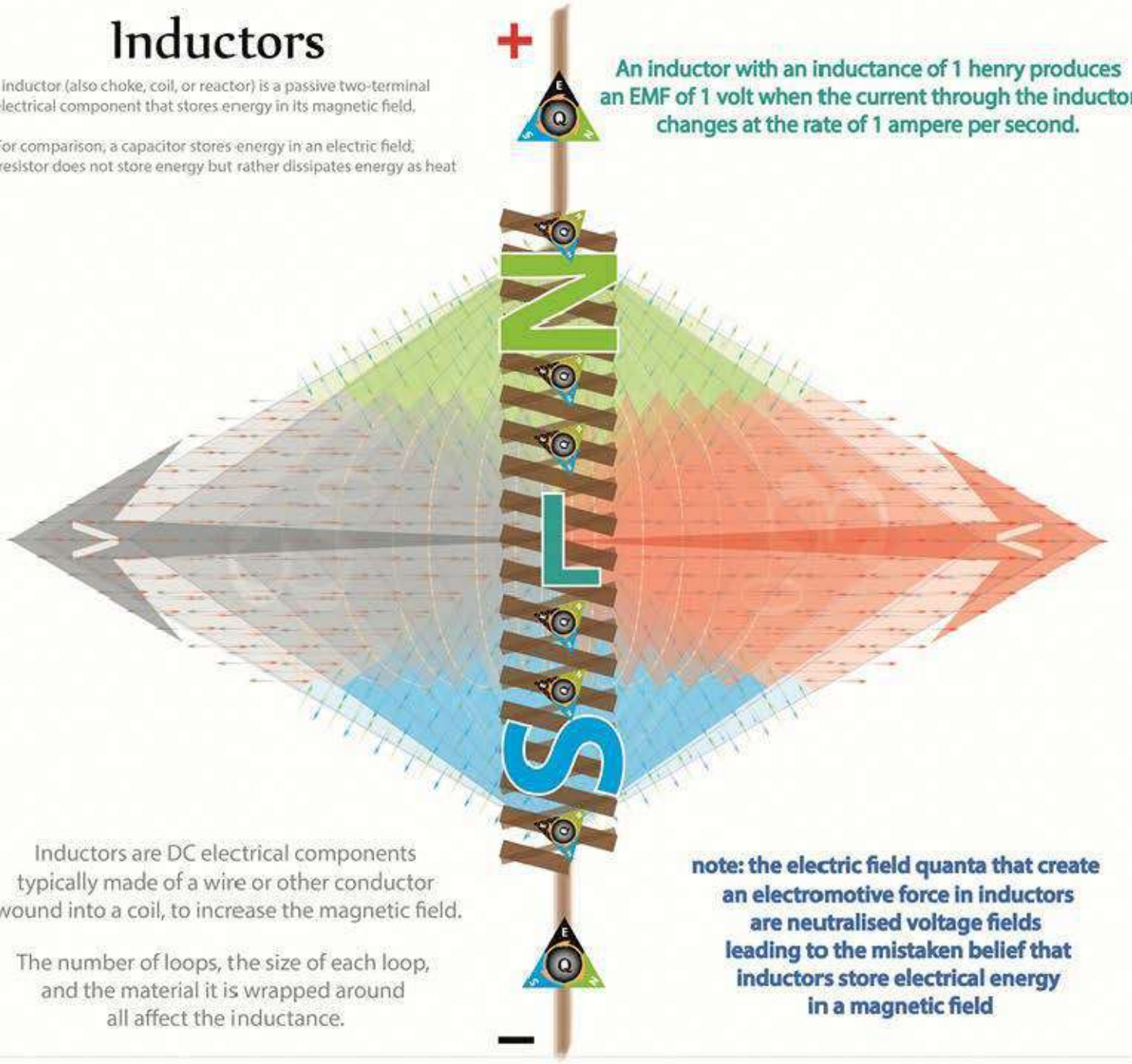
Inductors

An inductor (also choke, coil, or reactor) is a passive two-terminal electrical component that stores energy in its magnetic field.

For comparison, a capacitor stores energy in an electric field, and a resistor does not store energy but rather dissipates energy as heat

An inductor with an inductance of 1 henry produces an EMF of 1 volt when the current through the inductor changes at the rate of 1 ampere per second.

When the current flowing through an inductor changes, a time-varying electromagnetic field is created around the coil, and a changing emf voltage is formed



Tetryonics reveals the Magnetic fields of Inductors to be neutral Electro-Magnetic fields

Magneto-static fields

Inductors are DC electrical components typically made of a wire or other conductor wound into a coil, to increase the magnetic field.

The number of loops, the size of each loop, and the material it is wrapped around all affect the inductance.

note: the electric field quanta that create an electromotive force in inductors are neutralised voltage fields leading to the mistaken belief that inductors store electrical energy in a magnetic field

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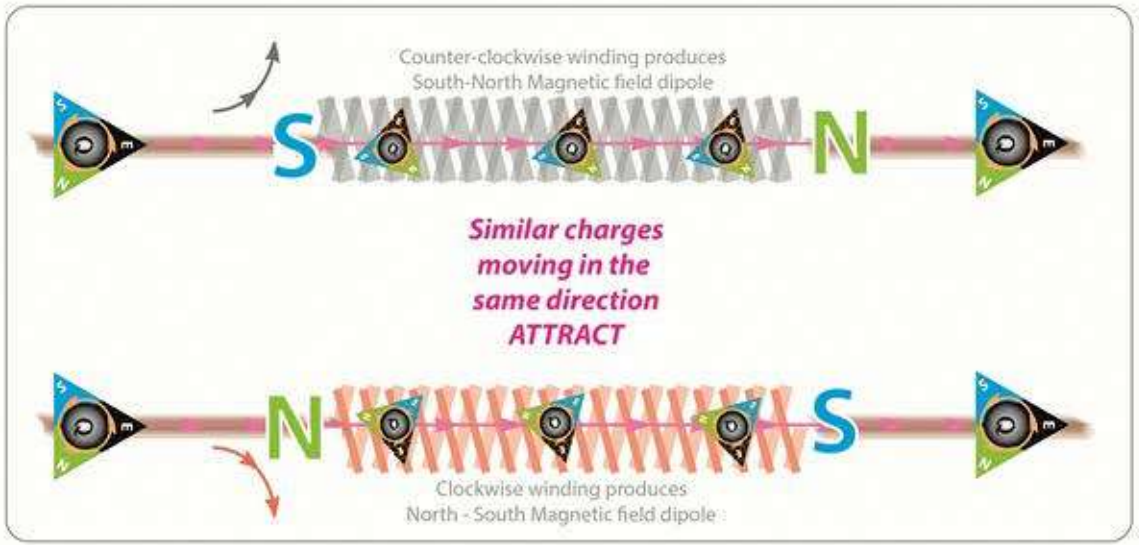
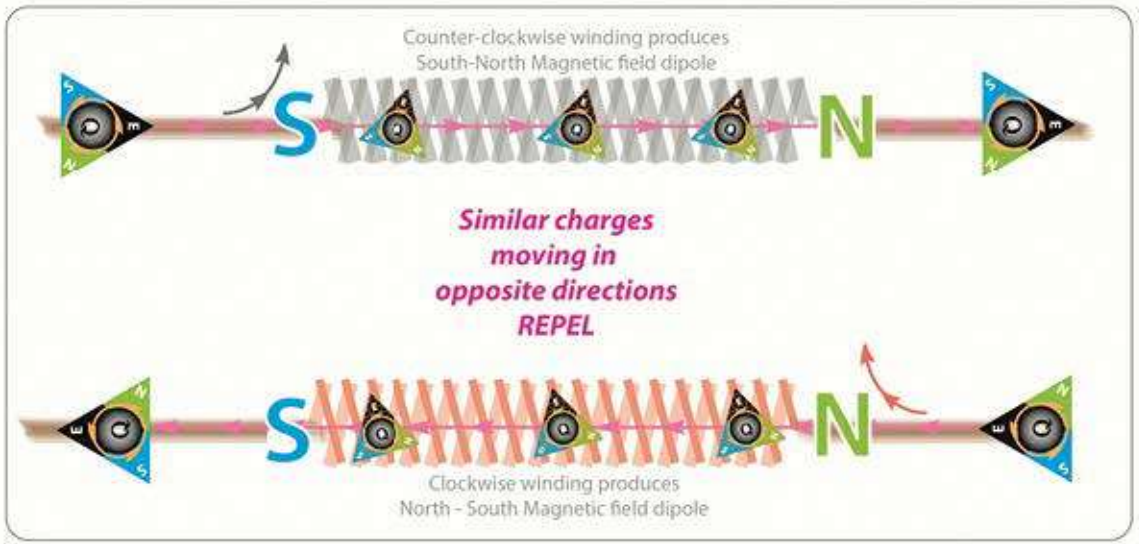
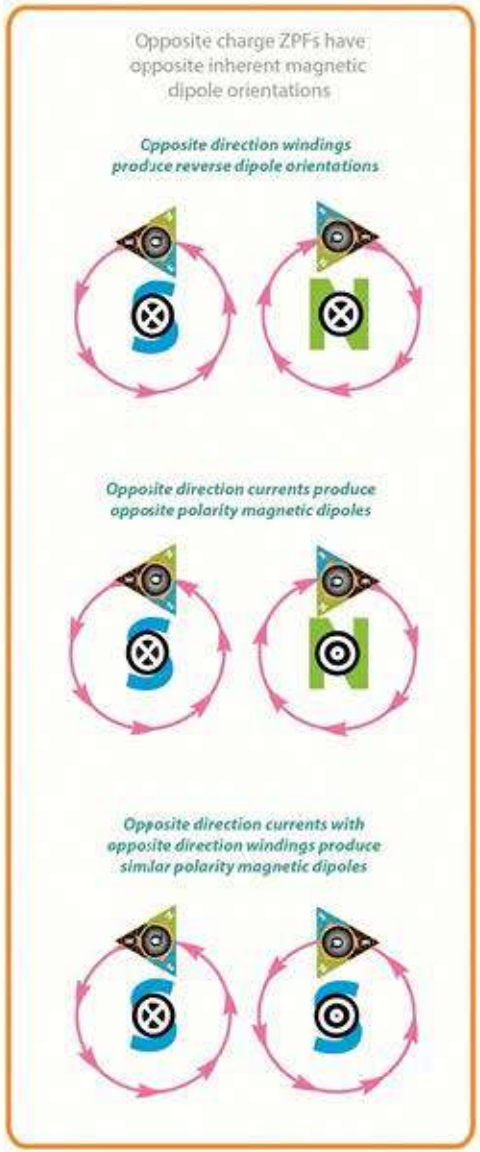




Charges moving in an Inductive winding



This is best viewed using physical models

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Capacitors

Changing Electric fields
create
changing Magnetic fields

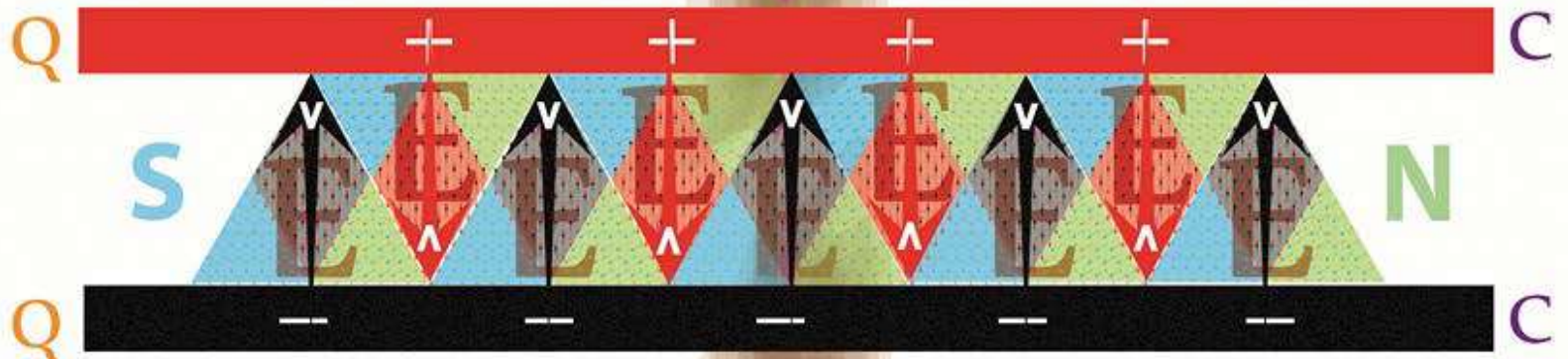
A capacitor is a passive two-terminal AC electrical component
used to store alternating electrical energy in an electric field.
It blocks the block of direct currents.

Changing Magnetic fields
create
changing Electric fields

Capacitors store & pass electrical energy as charged 2D masses

Capacitors store EM Energy
as transverse Bosons

Capacitors store charged
masses between their plates



Charged Matter [current] does not
flow between the plates
of a Capacitor

ODD.hv

charge

A common form of energy storage device is a parallel-plate capacitor whose capacitance is directly proportional to the surface area of the conductor plates and inversely proportional to the separation distance between the plates.

volts

hv^2

Capacitance

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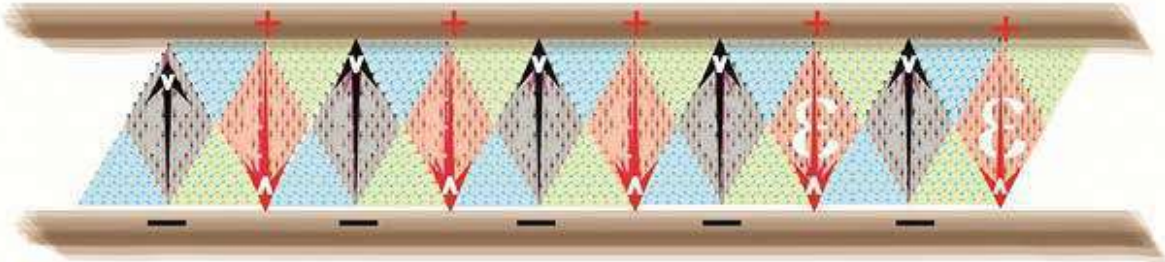
Capacitance

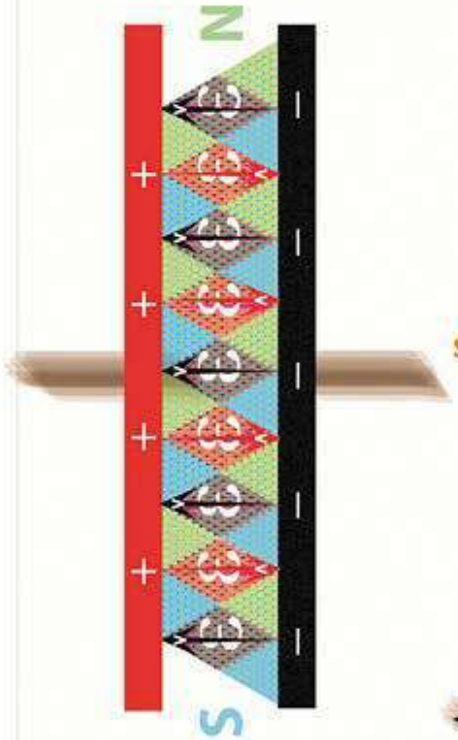
The SI unit of capacitance is the farad (symbol: F), named after the English physicist Michael Faraday

In general any separated charges will create a emf voltage

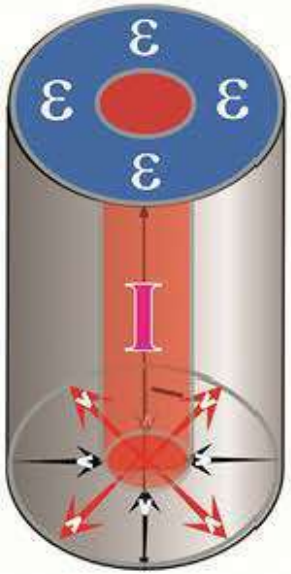


Any two electrical conductors separated by a non-conducting (or very high resistance) medium is a capacitor
[these can be plates, conductive wires or coaxial cables etc]

Plate capacitors



Coaxial cables



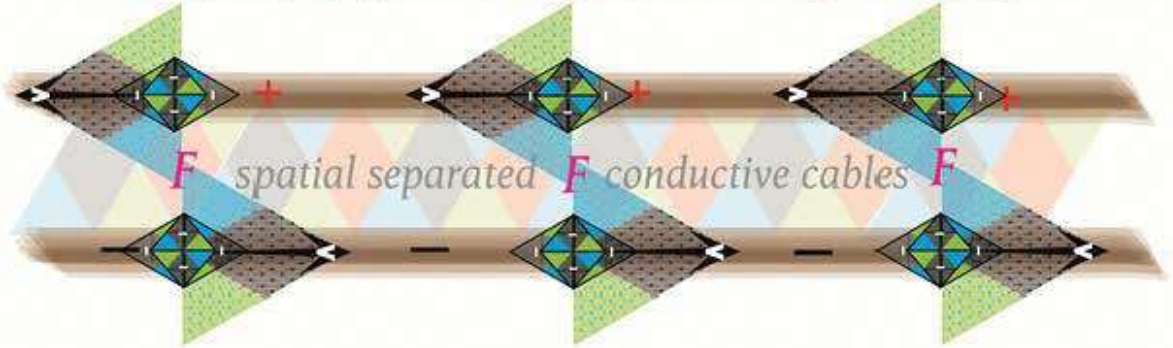
Capacitance is the ability of a body to store an electrical charge.

$$C = \frac{Q}{V}$$

Any object that can be electrically charged exhibits capacitance

A 1 farad capacitor when charged with1 coulomb of electrical charge will have a potential difference of 1 volt between its plates.

should a current flow in the conductors the capacitive field will be dominated by orthogonal, superpositioned Amperian M-fields of greater strength



Capacitance is a function only of the physical dimensions (spatial geometry) of conductors and the permittivity of the dielectric separating them

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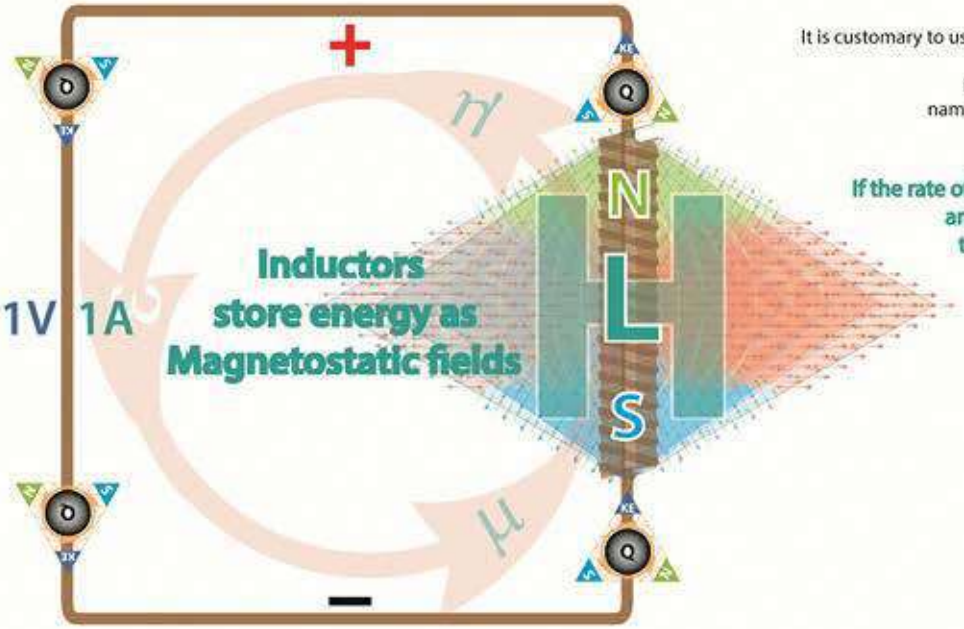
Inductive and Capacitive energy storage



It is customary to use the symbol L for inductance, in honour of the physicist Heinrich Lenz.

In the SI system the unit of inductance is the Henry, named in honor of the scientist who discovered inductance, Joseph Henry.

If the rate of change of current in a circuit is one ampere per second and the resulting electromotive force is one volt, then the inductance of the circuit is one henry

$$v_m = \sum_{n=1}^{K} L_{m,n} \frac{di_n}{dt}.$$

The voltage across an inductor is equal to the product of its inductance and the time rate of change of the current through it

Joseph Henry

[17 December 1797 – 13 May 1878]

Michael Faraday

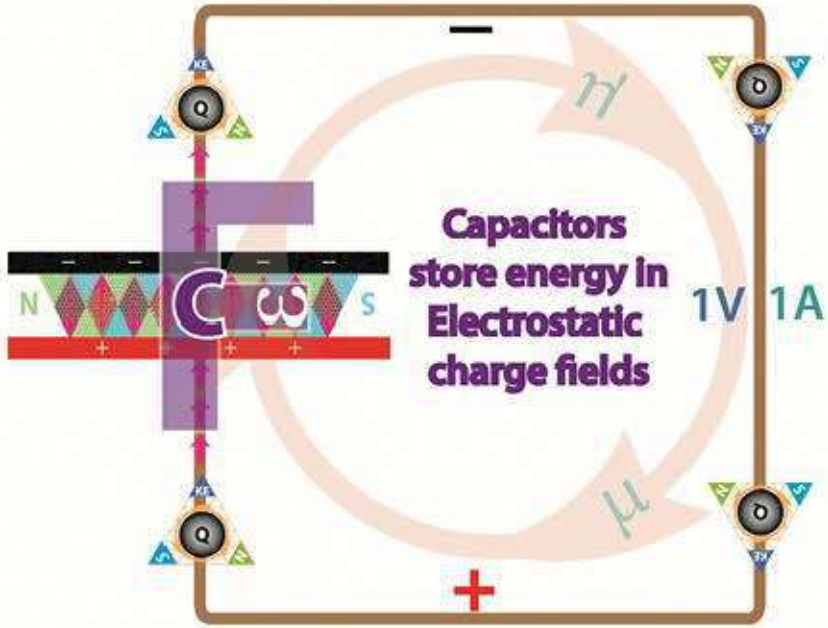
[22 September 1791 – 25 August 1867]

The SI unit of capacitance is the farad (symbol: F), named after the English physicist Michael Faraday

a 1 farad capacitor when charged with 1 coulomb of electrical charge will have a potential difference of 1 volt between its plates.

$$W_{\text{stored}} = \frac{1}{2}CV^2 = \frac{1}{2}\varepsilon_r\varepsilon_0\frac{A}{d}V^2.$$

Capacitance is the ability of a body to store an electrical charge. Any object that can be electrically charged exhibits capacitance.



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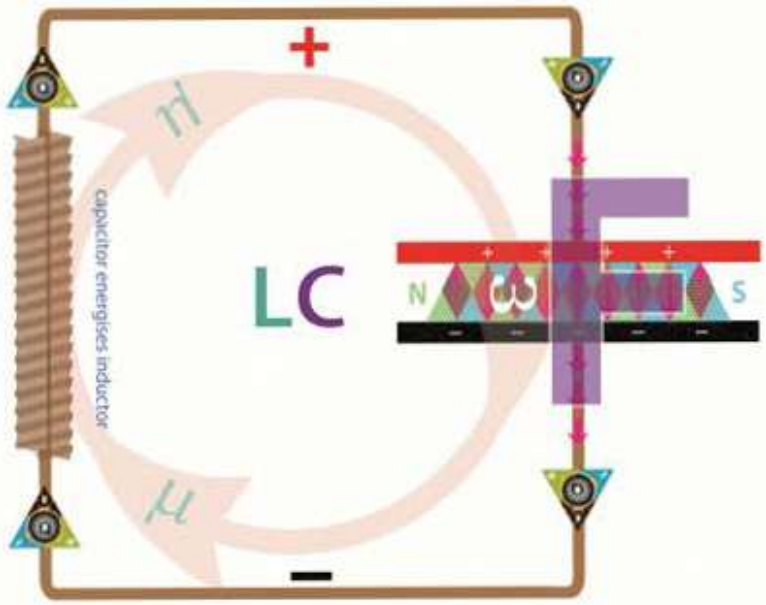
Inductive - Capacitive circuits

An LC circuit, also called a resonant circuit, tank circuit, or tuned circuit, consists of an inductor, represented by the letter L, and a capacitor, represented by the letter C.

LC

When connected together, they can act as an electrical resonator, an electrical analogue of a tuning fork, storing energy oscillating at the circuit's resonant frequency

These LC circuits are idealised models assuming there is no dissipation of energy due to resistance over time, with the circular EM vectors representing electron current flow in the circuit and its translation between inductive and capacitive forms of energy storage.



If a charged capacitor is connected across an inductor, charge will start to flow through the inductor, building up a magnetic field around it and reducing the voltage on the capacitor.

Eventually all the charge on the capacitor will be gone and the voltage across it will reach zero.

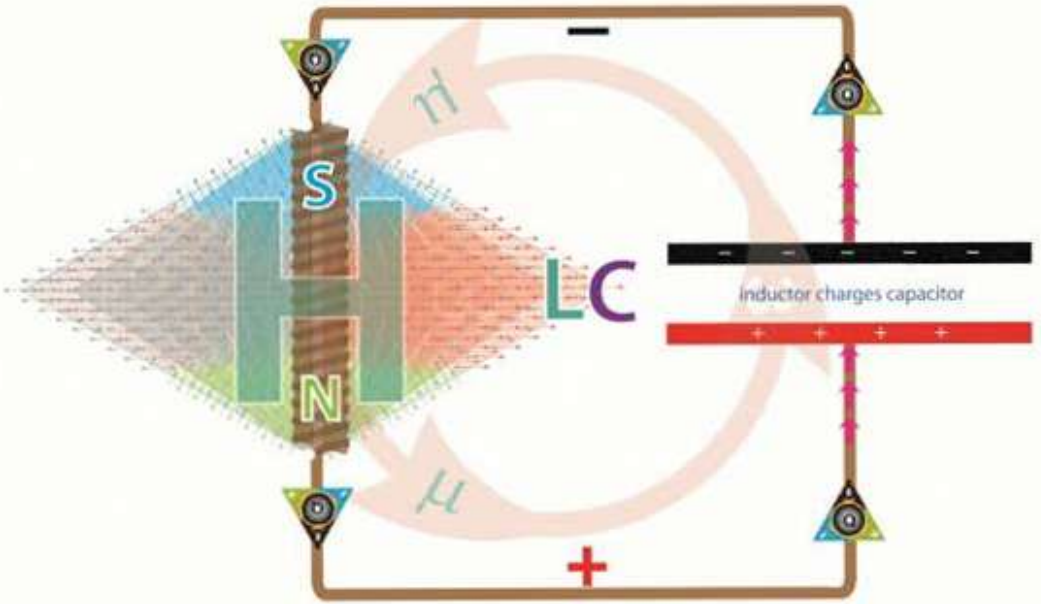
However, the current will continue, because inductors resist changes in current.

The energy to keep it flowing is extracted from the magnetic field, which will begin to decline.

The current will begin to charge the capacitor with a voltage of opposite polarity to its original charge.

When the magnetic field is completely dissipated the current will stop and the charge will again be stored in the capacitor, with the opposite polarity as before.

Then the cycle will begin again, with the current flowing in the opposite direction through the inductor.



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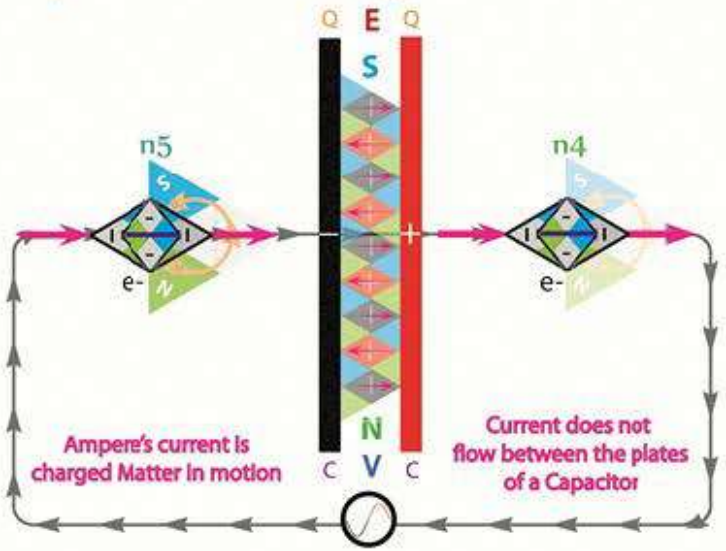
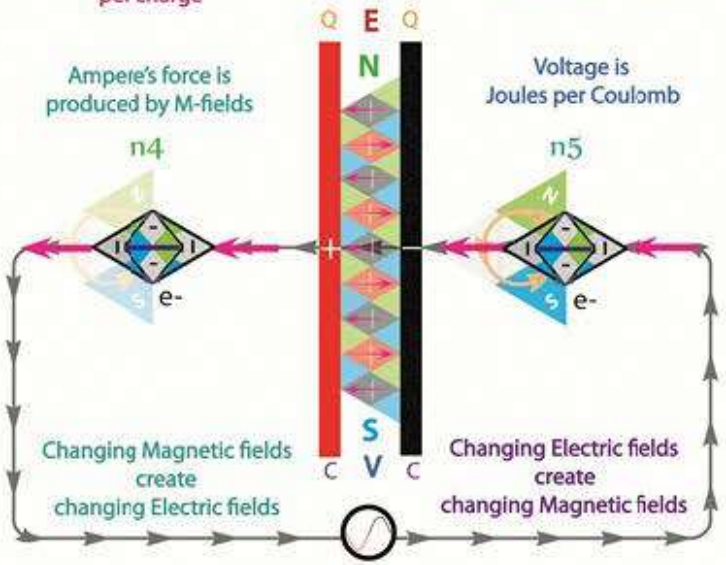
Capacitors store EM Energy as transverse Bosons



Capacitors store Energy as Joules per charge

Capacitors store & pass energy as charged masses



Capacitors store charged masses between their plates

Displacement Current

Maxwell's displacement current is better termed a 'displacement voltage' in light of the fact the charged Matter does not move/flow between the charged plates of a capacitor only the charged mass-energies.

Changing Electric fields produce changing Magnetic fields and vice versa as a direct result of their respective E&M field geometries within the Planck quanta of EM fields

$$\nabla \times \mathbf{B} = \epsilon_0\mu_0 \frac{\partial \mathbf{E}}{\partial t} + \mu_0 \mathbf{J},$$

As opposed to Maxwell's view of a 'stretching ether' that stores energy between the capacitive plates

As the energy content of a charge increases so does its voltage

Equilateral energy momenta is stored compressively in the inductive quantum fields [ZPF] as it increases, and is released via charged exchange W-Bosons

Producing a capacitive region of ElectroMagnetic fields and stress energies

Bosons are transverse stores of energy momenta

$$\mathbf{J}_D = \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$$

'Displacement Currents' between charged surfaces are produced by a increasing Electric Field component that seeks equilibrium

It must be carefully borne in mind that we have made only one step in the theory of the action of the medium. We have supposed it to be in a state of stress, but we have not in any way accounted for this stress, or explained how it is maintained. This step, however, seems to me to be an important one, as it explains, by the action of the consecutive parts of the medium, phenomena which were formerly supposed to be explicable only by direct action at a distance.

Maxwell - On Physical Lines of Force (1861)

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mass

$$\frac{E}{c^2} = m$$

mass-energy momenta in a 2D equilateral geometry

Radiant waveform
EM mass-energies

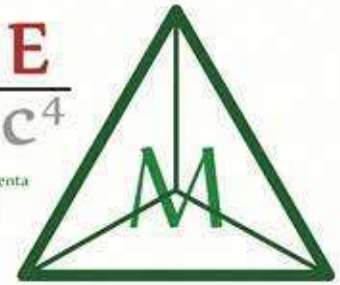
$$mc^2 = E = Mc^4$$

A clear geometric distinction can now be made between **EM mass geometries** and standing wave **Matter topologies**

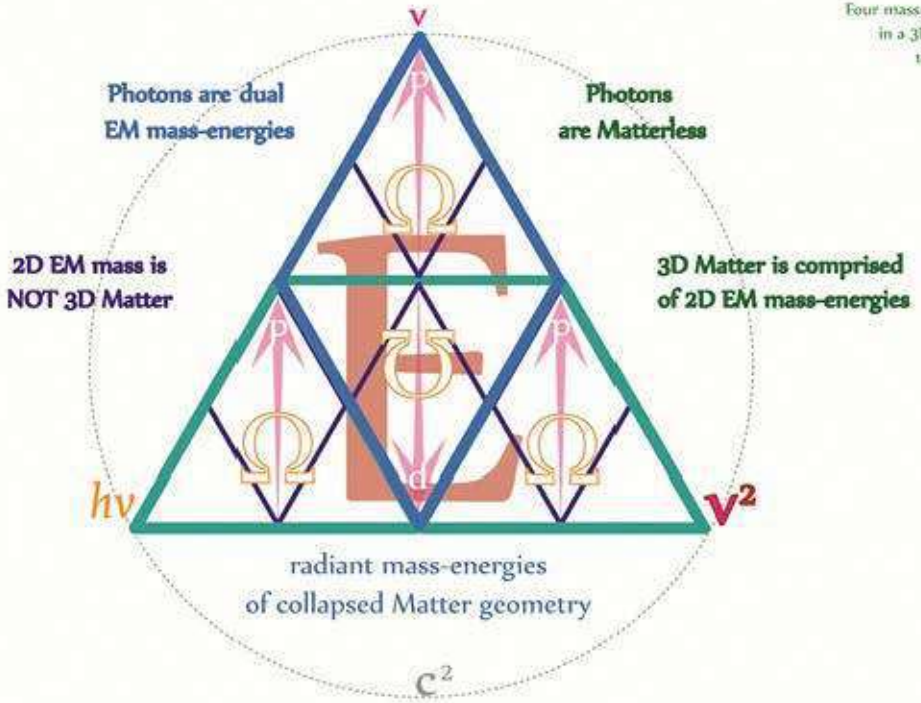
Matter

$$M = \frac{E}{c^4}$$

Four mass-energy momenta in a 3D tetrahedral topology



Standing waveform
EM energies



$$n\pi_{\text{mass}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

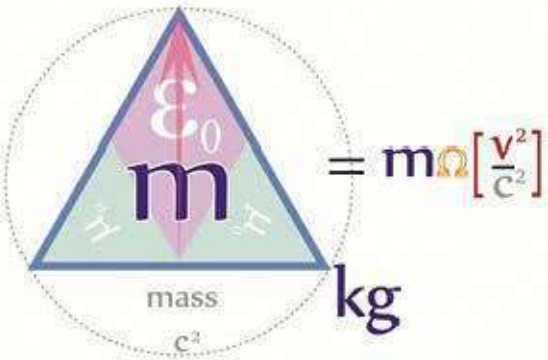
EM Field · Planck quanta
ElectroMagnetic · mass · velocity

$$T\pi_{\text{Matter}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta
ElectroMagnetic · mass · velocity

ρ/second

ρ/second²



$$= m\Omega\left[\frac{v^2}{c^2}\right]$$

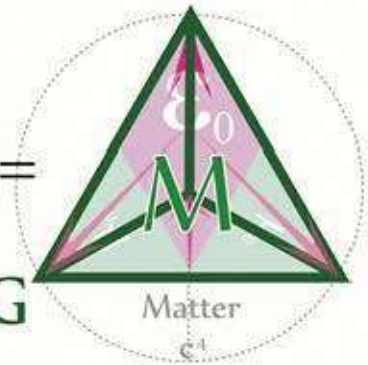
kg

Radiant EM masses

$$\frac{4\pi m}{c^2} = M$$

Standing-wave mass-Matter

$$m\Omega\left[\frac{v^2}{c^4}\right] =$$



KG

massless particles are a scientific misnomer and massless must now be re-termed Matterless

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de Broglie Matter-waves

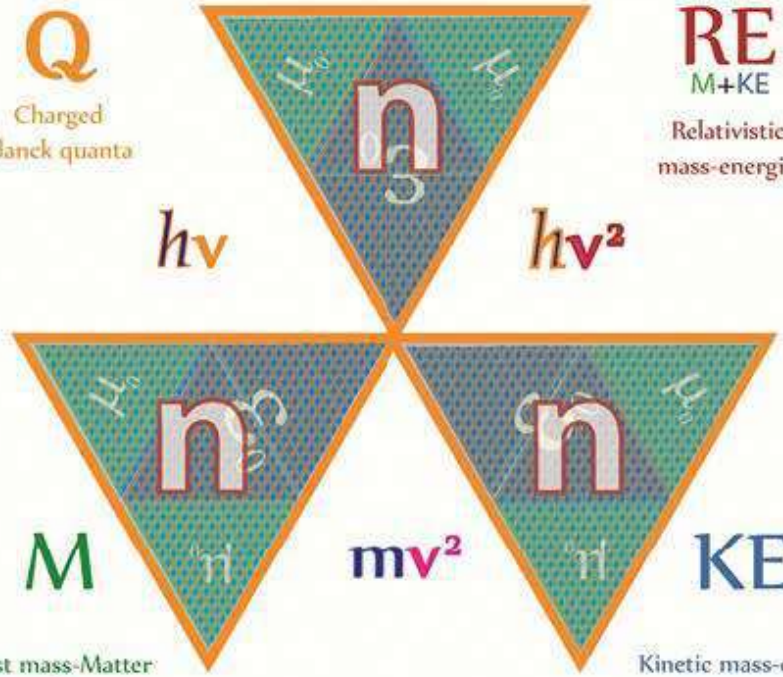
EM CHARGE
provides the foundational interaction geometry for all mass & Matter

In quantum mechanics, a Matter wave or de Broglie wave is the probabilistic electromagnetic quantum wave-form created by the Planck elements constituting Matter

Relativistic mass-energy is the total sum of all Planck energy momenta in any spatial co-ordinate system

Q
Charged Planck quanta

RE
M+KE
Relativistic mass-energies



M
rest mass-Matter topologies

KE
Kinetic mass-energy geometries

All EM waves and Matter are made up of integral Planck quanta [any imbalance results in Charge] as the number of Planck quanta increases their associated wavelengths decrease

The relativistic stress tensor mass-energies of Matter in motion is the sum of its standing-wave mass-Matter topology and its Lorentz corrected kEM field mass-energy geometries

3D MATTER
is the charged topology created by standing-waves of 2D mass-energies

Kinetic EM mass-energy levels depend on the velocity of the Matter particle in motion
[in Matter energy travels in a standing wave at the speed of Light]

Kinetic EM fields are the mass-energy fields created by Matter in motion

The rest mass-energy geometries comprising all Matter topologies are velocity invariant

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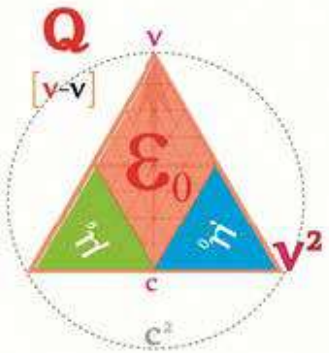
Material EM masses

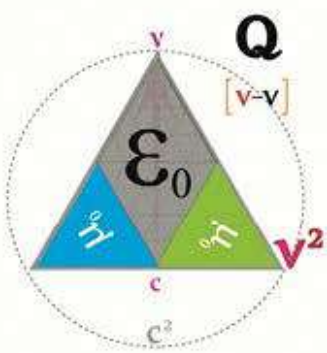
deBroglie wavelength & Compton frequency



λ

Any increase in Energy quanta results in a decrease in EM mass quanta wavelengths

v^2



In Matter all energy propagates at c

$$mv^2 = E = hv^2$$

in Standing wave Matter

v=c

Number of Quanta comprising rest Matter

Compton Frequency

$$\frac{mc^2}{h} = 1 \times 10^{19}$$

Electron Compton Frequency

$= 1.2 \times 10^{20}$ quanta

v^2

Wavelength of Quanta comprising rest Matter

de Broglie wavelength

$$\frac{h}{mc} = 2.99792456 \times 10^{-33}\ m$$

Electron de Broglie wavelength

$= 4.002769142 \times 10^{-11}$ m

λ

Linear momentum of standing wave Energy comprising Matter

Intrinsic Particle Momenta

$$mc = 2.211340633 \times 10^{-23}\ N_s$$

Intrinsic Electron momenta

$= 2.95253793 \times 10^{-22}$ N_s

p

The Compton frequency, deBroglie wavelength and Energy momenta of any physical system are all related through the speed of Energy [c]

The examples above are for stationary Electrons any motion will NOT affect the results for the electron itself (however a extended KEM field will be produced by the motion and its properties will be affected by changes in velocity)

In Lorentz invariant Matter the standing wave Energy always propagates at the speed of Light [c] (with the KEM field subject to Lorentz corrections)

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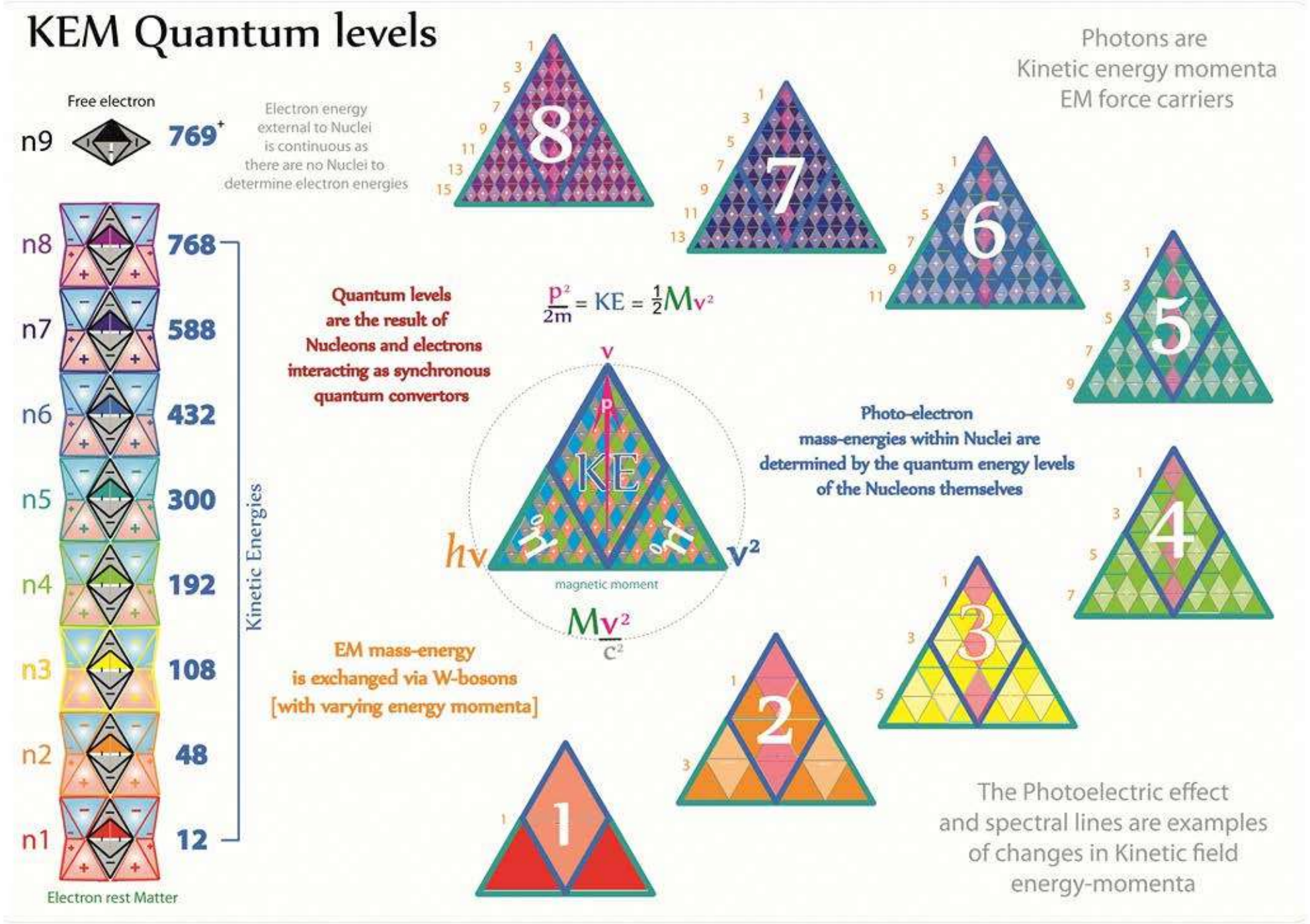

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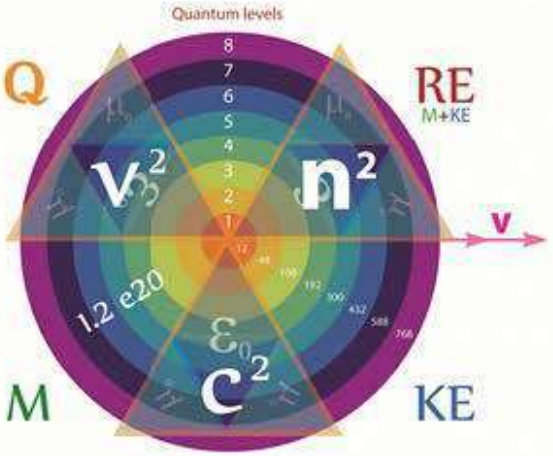
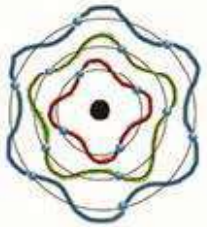
deBroglie relationships



rest mass-Matter is velocity invariant

" The electron which is moving in a sine wave circular path, will repeat the same sine wave path in each successive orbit. The sine wave paths in consecutive orbits will exactly overlap. The electron wave reconnects with itself and is in phase with itself. "

An electron bound in a atomic nuclei will trace a toroidal path around the nuclei mapped by the sine wave motion of any point on its charged geometric surface



$$\lambda = \frac{h}{p}$$

$$f = \frac{E}{h}$$

Louis de Broglie

(15 August 1892 – 19 March 1987)

$$p = \frac{h}{\lambda} = \frac{h}{2\pi}\frac{2\pi}{\lambda} = \hbar k$$

Although Mathematically correct the illustrative model commonly used to depict the deBroglie relationships is incorrect

The relativistic energy of Matter in motion is a measure of its standing wave mass-energies, and the object's velocity related kinetic energy and magnetic moment in the form of a KEM wave geometry

The greater the KEM field energy level the smaller the quantum wavelength of the KEM field's EM mass

All mass-Matter topologies are Lorentz velocity invariant, only the EM mass-energy content and quantised angular momentum of the Kinetic EM fields vary

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Electron Positions in Atomic Orbitals

Werner Heisenberg

(5 December 1901 – 1 February 1976)

Atomic orbitals are typically described as "hydrogen-like" (meaning one-electron) wave functions over space, categorized by n, l, and m quantum numbers, [as covered in Tetryonic Chemistry] which correspond to the electron's energy, angular momentum, and an angular momentum vector component, respectively

Using Tetryonics as a EM field model, an electron's position and velocity CAN be modelled simultaneously (but any attempt to measure or interact with it, will affect its energy levels)

Quantum Mechanics is a statistical [mathematical] representation of equilateral, charged geometries and EM energy interactions

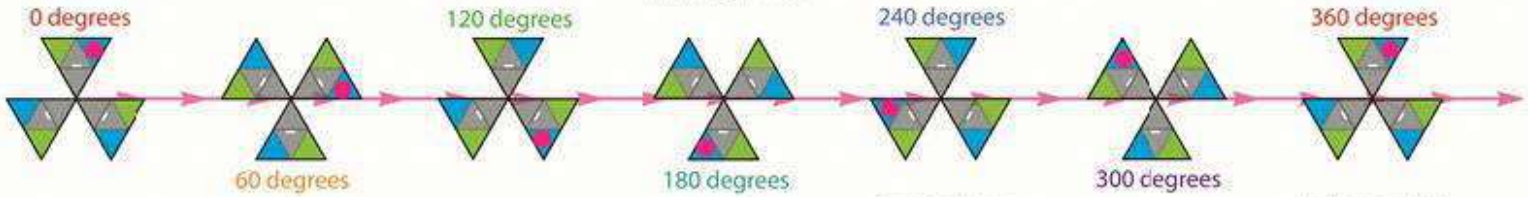
Erwin Schrödinger

(12 August 1887 – 4 January 1961)

The unique 12 facet topology of Leptons results in the same geometry being presented every 120° rotation of the particle

Leacing to the interpretation that the Lepton disappears and re-appears when being measured

Making accurate measurement of its rotational dynamics incorrect without correct models

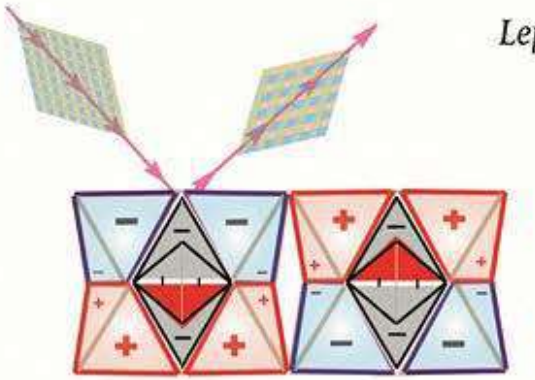


Additionally, every radial arm of the Lepton's topology is identical to every other

Including Electric fields and Magnetic dipole orientations

Tetryonics resolves these issues with an accurate 3D model of Leptons

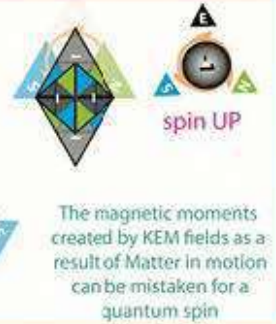
And Quantum Levels thus providing a solid foundation for explaining Electro-Dynamics



Leptons are 6 loop quantum loop inductive rotors

Lepton's are Spin 1 particles that can easily be misinterpreted as 1/2 or 3 quantum spin numbers without the correct physical models to interpret physcical observations on

The charged facia presented changes continously, with a complete fascia change occuring in every 30 degrees of rotation



The magnetic moments created by KEM fields as a result of Matter in motion can be mistaken for a quantum spin

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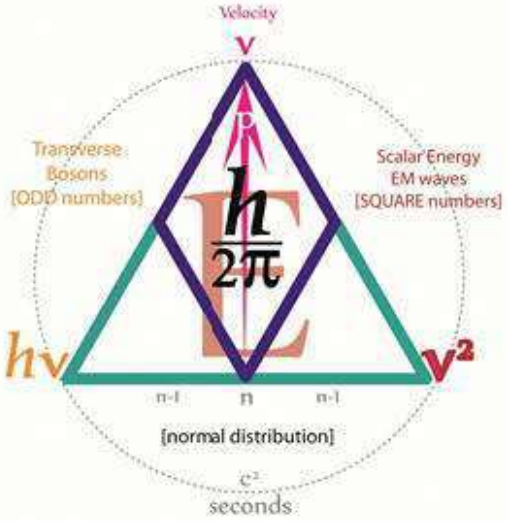
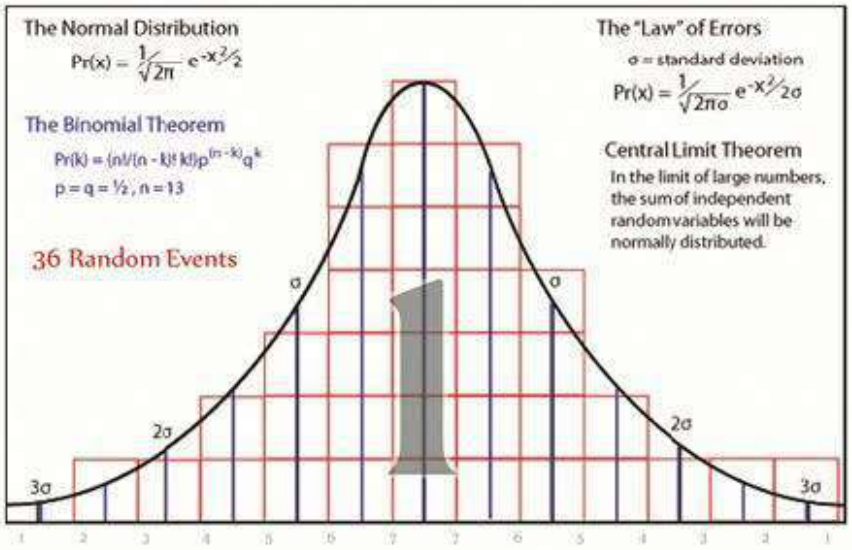
Distributions and Uncertainty

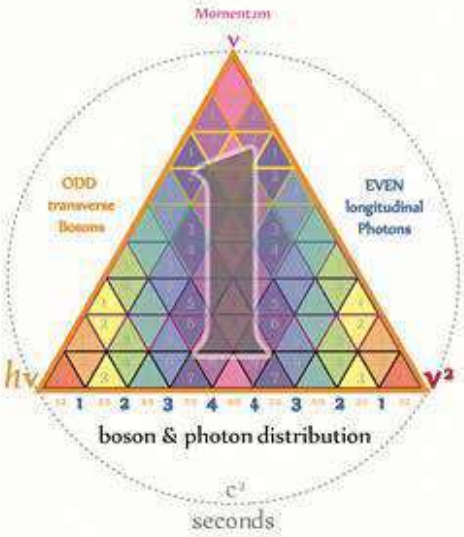
A Bell Curve (Normal Distribution) is a mathematical reflection of the integral Planck mass-energy momenta quanta distributions found in all equilateral charge geometries

Probabilities are the square of the Amplitude





All probabilities are re-normalisable and sum to Unity



All Matter and EM fields are comprised of equilateral mass-energy momenta and any attempt to measure the system involves the introduction of additional Planck EM quanta into the systems

John Stewart Bell

(28 June 1928 – 1 October 1990)

No physical theory of local hidden variables can reproduce all of the predictions of quantum mechanics.

WRONG

$$\Delta p \, \Delta x \geq \frac{1}{2} \hbar$$

Quantum uncertainty formulation

$$\Delta E \, \Delta t \geq \frac{1}{2} \hbar$$

The more precisely the position is determined, the less precisely the momentum is known in this instant, and vice versa.

Heisenberg, uncertainty paper, 1927

WRONG

Werner Heisenberg

(5 December 1901 – 1 February 1976)

Chance is closely related to the ideas of uncertainty and indeterminacy.
Uncertainty today is best known from Werner Heisenberg's principle in quantum mechanics.
It states that the exact position and momentum of an atomic particle can only be known within certain limits.
The product of the position error and the momentum error is equal to a multiple of Planck's constant of action.
This irreducible randomness in physical processes established the existence of chance and indeterminism in physics

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Leptronic Self-energies

As the velocity of a charged particle increases
the energy level of its KEM field increases

$$\frac{4n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

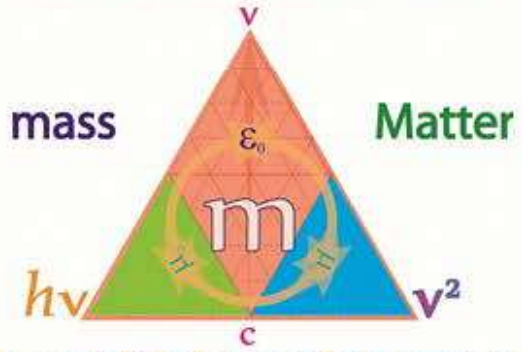
KEM field · Energy · Planck quanta · mass · velocity · momenta

mass

radiant energy per second

$$E/c^2$$

KEM field geometries generated as a product of Matter in motion are Lorentz variant



Quantum inductive loops resist changes to energies contained in their equilateral energy fields [inertial mass]

$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

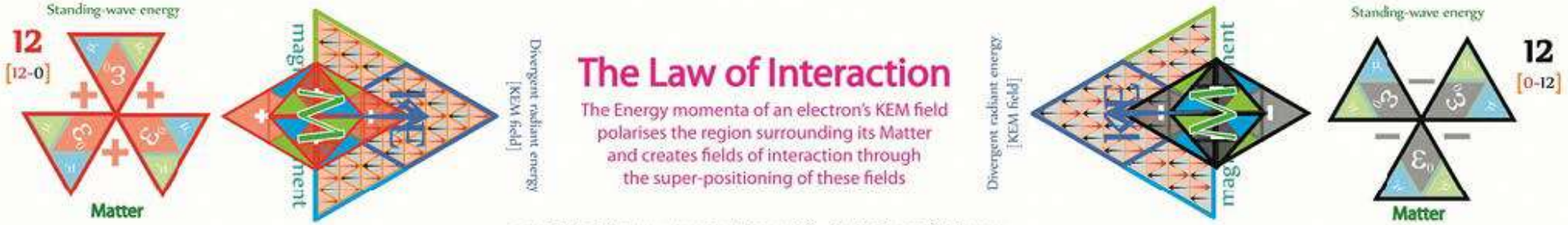
Matter · Energy · Planck quanta · mass · velocity · momenta

Matter

standing-wave energy per second squared

$$E/c^4$$

rest mass-Matter topologies are not affect by changes in velocity [Matter is Lorentz invariant]



a particle's self-energy represents the contribution to the particle's energy, or effective mass, due to interactions between the particle and the system it is part of.

$$KEM = Mv^2$$

All Matter topologies are made up of quantum inductive loops which extract energy from any EM field they move through

Matter stores energy in its 3D planar facsia as charged mass-energy

additional to creating the familiar laws of interaction [opposite attract - similars repel] the KEM fields of leptons can act as tuned antennas extracting energy from their environment

KEM fields store energy in their 2D planar EM field as neutral divergent mass-energies

$$E = Mc^4$$

All Matter contains EM energy propagating in a standing wave topology at the speed of light (the source of inertial mass)

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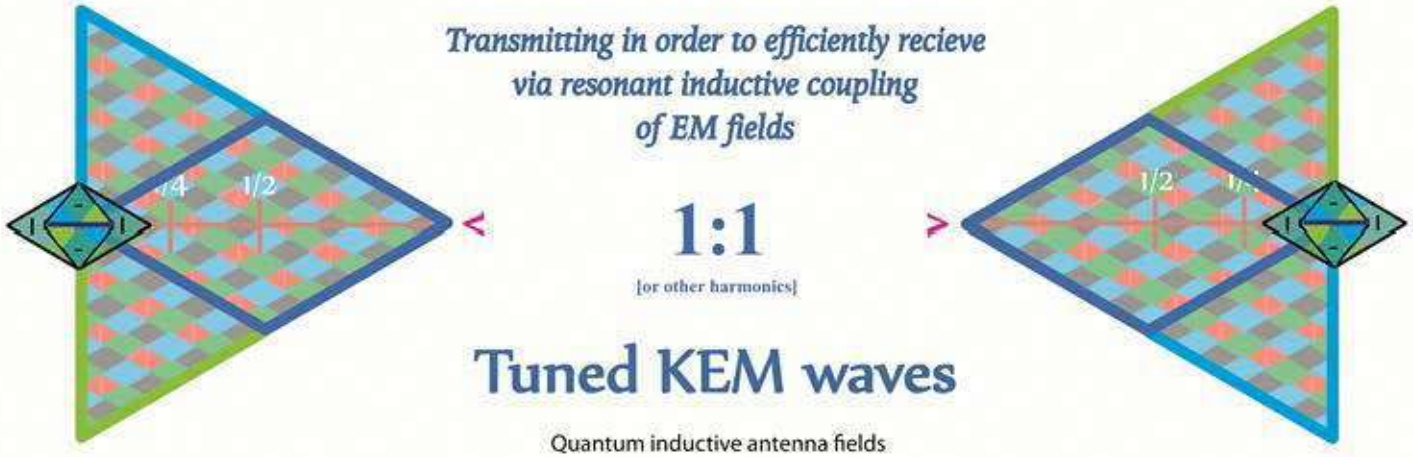
Resonant EM fields

Transmitting in order to efficiently recieve
via resonant inductive coupling
of EM fields

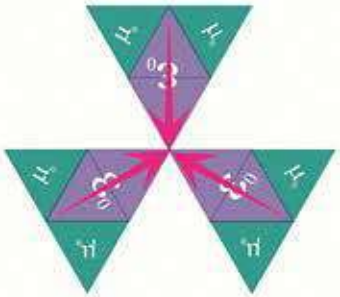


Tuned KEM waves

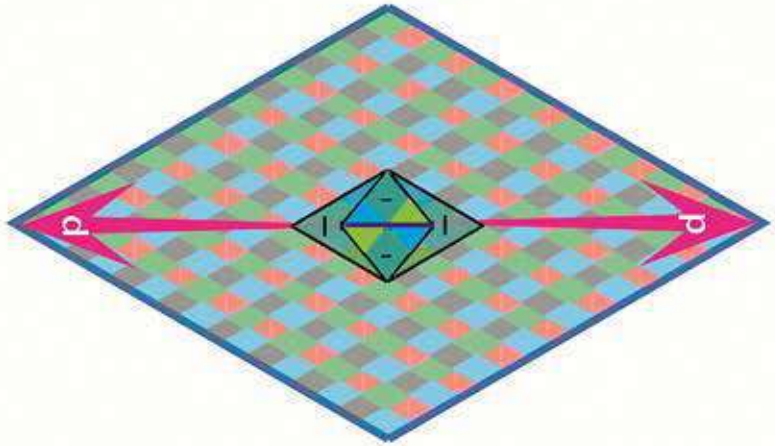
Quantum inductive antenna fields

Historically, all recieiving antennas have been mechanically tuned to match the sought EM wavelength
But if power is applied to a small wavelength electrostatic topology it creates a KEM field
that produces a much larger, tuned rhombic antenna field

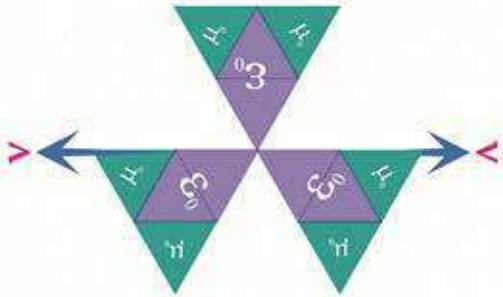
EM waves are hf geometries



Electron's rest Matter
stores EM mass-energy
in a standing wave



EM bosons have $h\nu$ geometries



Electrostatic particles of Matter
have dual KEM energy fields that
can act as resonant antennas

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Bosons

All Light is made of transverse EM energy Quanta

$$1\pi_{\text{Bosons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{EM Field}}.\left[m\Omega v^2\right]_{\text{Planck quanta}}\right]$$

ElectroMagnetic mass velocity

James Clerk Maxwell

$$\nabla\cdot\mathbf{D}=4\pi\rho$$

$$\nabla\times\mathbf{H}=\frac{4\pi}{c}\mathbf{J}+\frac{1}{c}\frac{\partial\mathbf{D}}{\partial t}$$

$$\nabla\times\mathbf{E}+\frac{1}{c}\frac{\partial\mathbf{B}}{\partial t}=0$$

$$\nabla\cdot\mathbf{B}=0$$

ElectroMagnetic waveforms propagate at the speed of light

Photons

All Light consists of longitudinal harmonic oscillators

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right]_{\text{EM Field}}.\left[m\Omega v^2\right]_{\text{Planck quanta}}\right]$$

ElectroMagnetic mass velocity

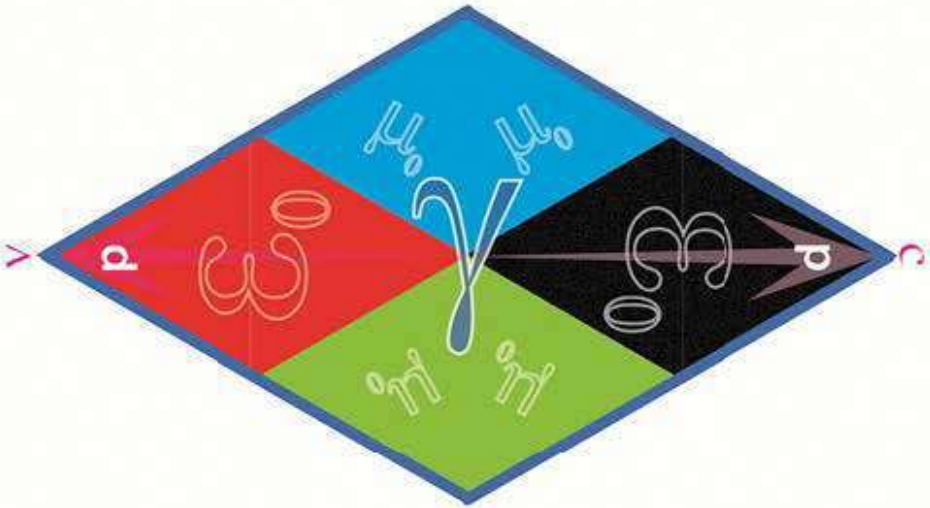
Energy is quantised

Max Planck

$$E = n.hv$$

All Photons have mass-Energy and momentum

$$\lambda=\frac{h}{p}=\frac{h}{mv}\sqrt{1-\frac{v^2}{c^2}}$$



Photons are particles

Albert Einstein

$$E = hf$$

All EM waves and Matter exhibit a Wave-Particle duality

$$i\hbar\frac{\partial}{\partial t}\Psi=\hat{H}\Psi$$

Matter is a probabilistic wave of EM particles

p

Louis de Broglie

Erwin Schrodinger

Ψ

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Photonic EM fields

James Clerk Maxwell

(13 June 1831 – 5 November 1879)

In 1865, James Clerk Maxwell's prediction that light was an electromagnetic wave, [which was confirmed experimentally in 1888 by Heinrich Hertz's detection of radio waves], seemed to be the final blow to particle models of light.

$$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity) · Photons

8.8541e-12

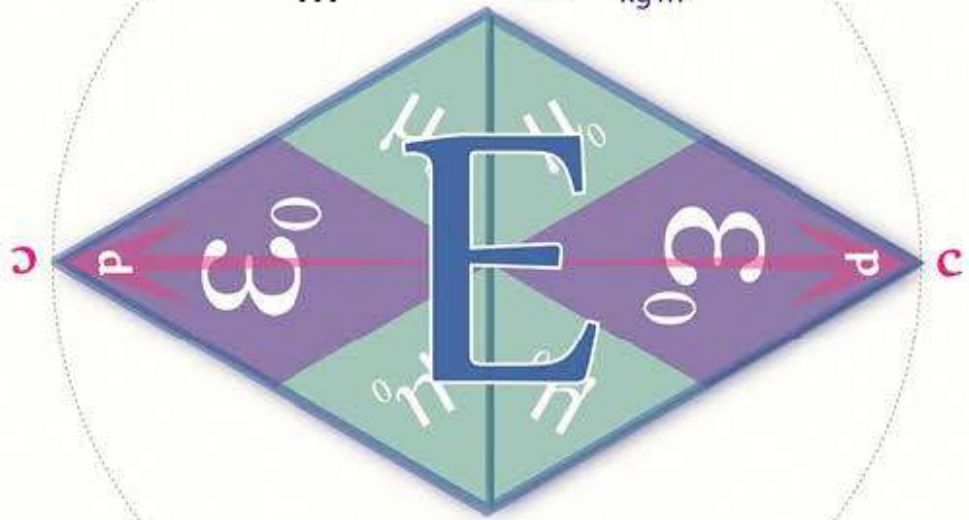
All EM mass-energy momenta propagates bi-directionally at c [the speed of light] in a vacuum

$$E = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}$$

Electric field strength

The strength of Electric fields is determined by the Electrical Permittivity Constant

$$\frac{F}{m}\quad \varepsilon_0 \quad \frac{A^2 s^4}{kg\, m^3}$$



$$\varepsilon_0\mu_0 = \frac{1}{c^2}$$

$$\frac{K_E}{K_M} = 9e16\ \frac{\frac{N\,m^2}{C^2}}{\frac{N\,s^2}{C^2}}$$

$$c^2 = 9e16\ \frac{m^2}{s^2}$$

$$c = 299{,}792{,}458\ \frac{m}{s}$$

The speed of light can be calculated using the Electric and Magnetic constants

The strength of Magnetic fields is determined by the Magnetic Permeability Constant

$$\frac{H}{m}\quad \mu_0 \quad \frac{kg\, m}{A^2 s^2}$$

$$B = \mu_0 H$$

$$[4\pi]e\text{-}7$$

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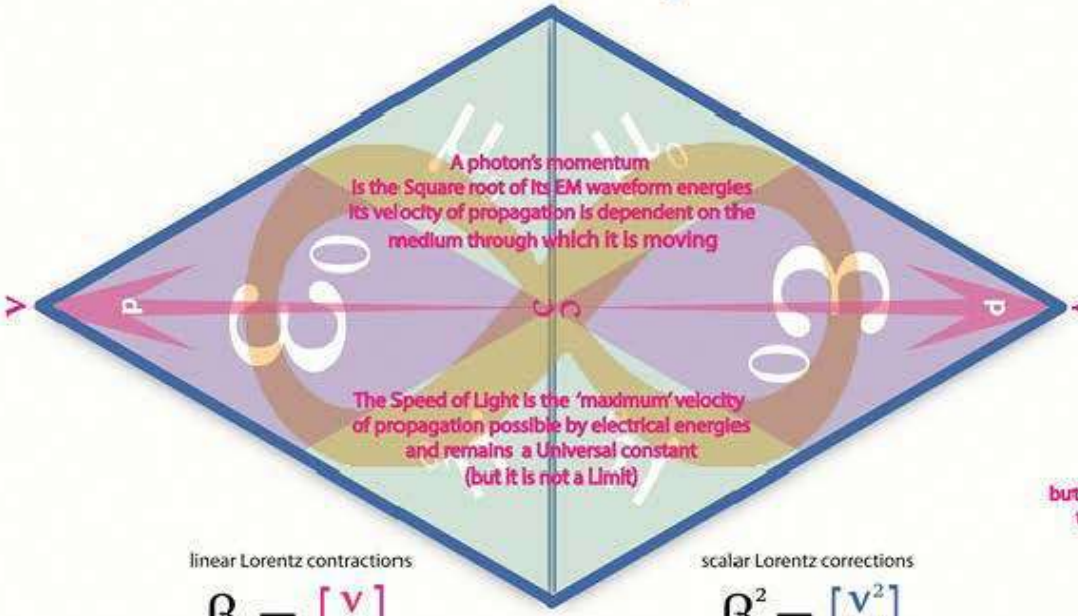
The ElectroMagnetic field geometry of Photons

$$2mv^2 = KE = hf$$

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[\,hv^2\,\right]\right]$$

(EM Field; Energy; momenta)

A photon's momentum
is the Square root of its EM waveform energies
its velocity of propagation is dependent on the
medium through which it is moving



Matter is comprised entirely of
equilateral electromagnetic energies

$$4n\pi_{\text{Matter}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(EM Field; Planck quanta; ElectroMagnetic mass velocity)

Matter topologies contain
standing-wave EM mass-energies
moving at the speed of light

The Speed of Light is the 'maximum' velocity
of propagation possible by electrical energies
and remains a Universal constant
(but it is not a Limit)

Photons are diamond geometry
ElectroMagnetic mass-energies

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega 0^2\right]\right]$$

(EM Field; Planck quanta; ElectroMagnetic mass velocity)

Light cannot have zero velocity or stand still
but it is possible (against Einstein's thought experiment)
to catch up to a photon and observe its waveform

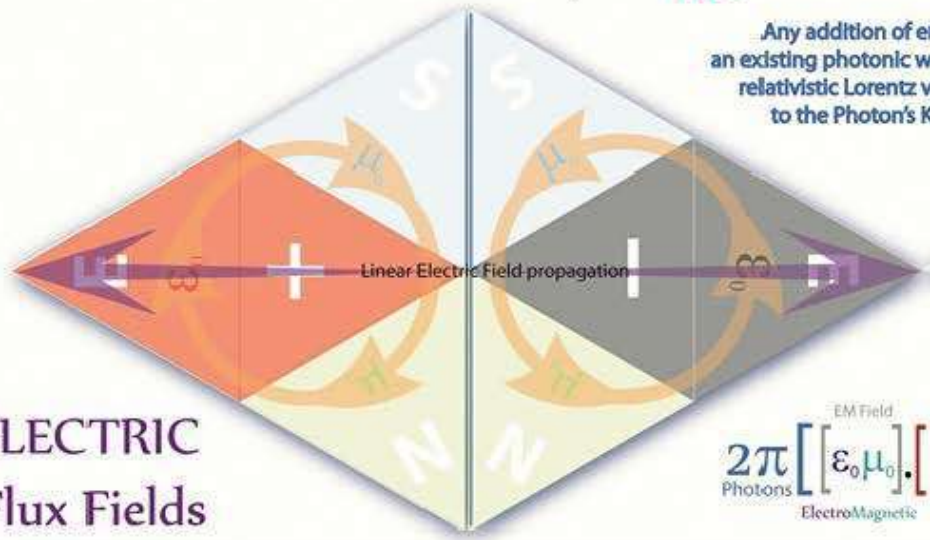
linear Lorentz contractions

$$\beta = \left[\frac{v}{c}\right]$$

scalar Lorentz corrections

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

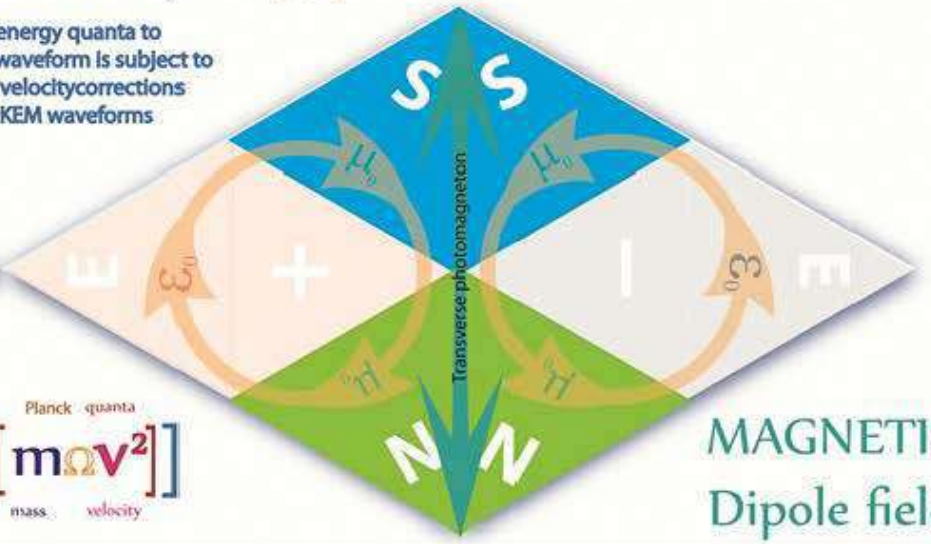
Any addition of energy quanta to
an existing photonic waveform is subject to
relativistic Lorentz velocitycorrections
to the Photon's KEM waveforms



ELECTRIC
Flux Fields

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(EM Field; Planck quanta; ElectroMagnetic mass velocity)



MAGNETIC
Dipole fields

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Photons and Charge bosons

Photons are dual [2π]
neutral charge quanta

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(EM Field: ElectroMagnetic; Planck quanta: mass, velocity)

Their Electric and Magnetic
fields are orthogonal to each other

**Bosons are transverse charge carriers
they combine to create ElectroMagnetic
photons which are longitudinal charge carriers**

They propagate
in differing mediums
at v/c

$$\text{EVEN}\,\pi_{\text{EM waves}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(EM Field: ElectroMagnetic; Planck quanta: mass, velocity)

nπ electromagnetic waves are comprised of
numerous 2π photons of the same wavelength
(save in superpositioned states - White light)

Photons are dual Boson waveforms

$$E = 2h\nu$$

$$E = hf$$

**A moving charge creates a magnetic field throughout space
that is perpendicular to the direction of motion.**

**Photons require NO ether to propagate
they are discrete bundles of EM energy-momenta**

**Similarly, a magnet has an intrinsic neutral electric field
that is perpendicular to its Magnetic Dipole.**

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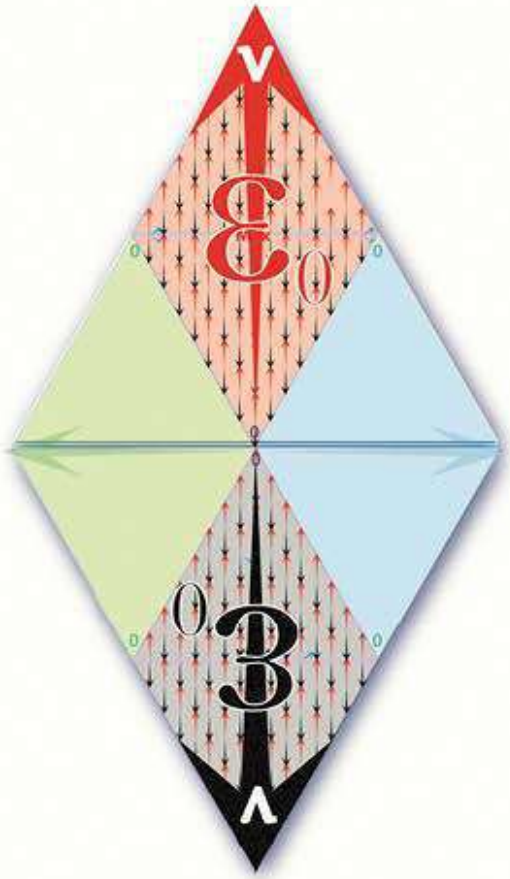
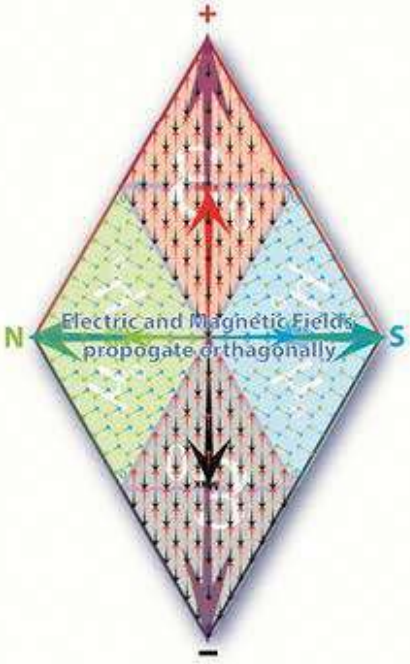
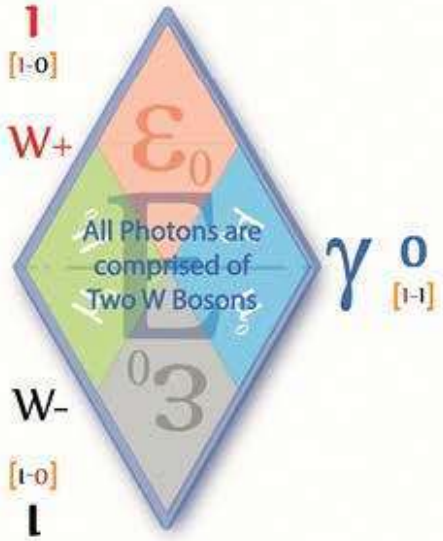
Photon EM strength vectors

Electric field force vectors

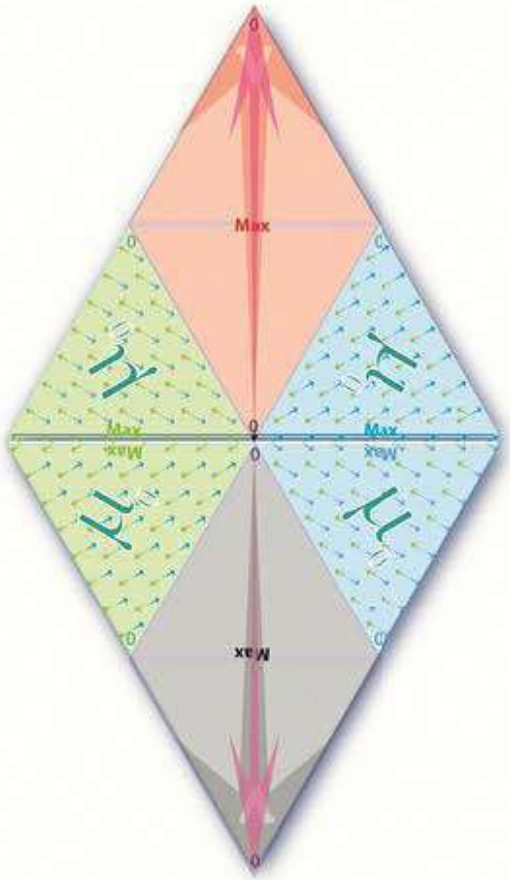


When E field flux is at Maximum
B field flux is at Minimum





Magnetic field force vectors



When B field flux is at Maximum
E field flux is at Minimum

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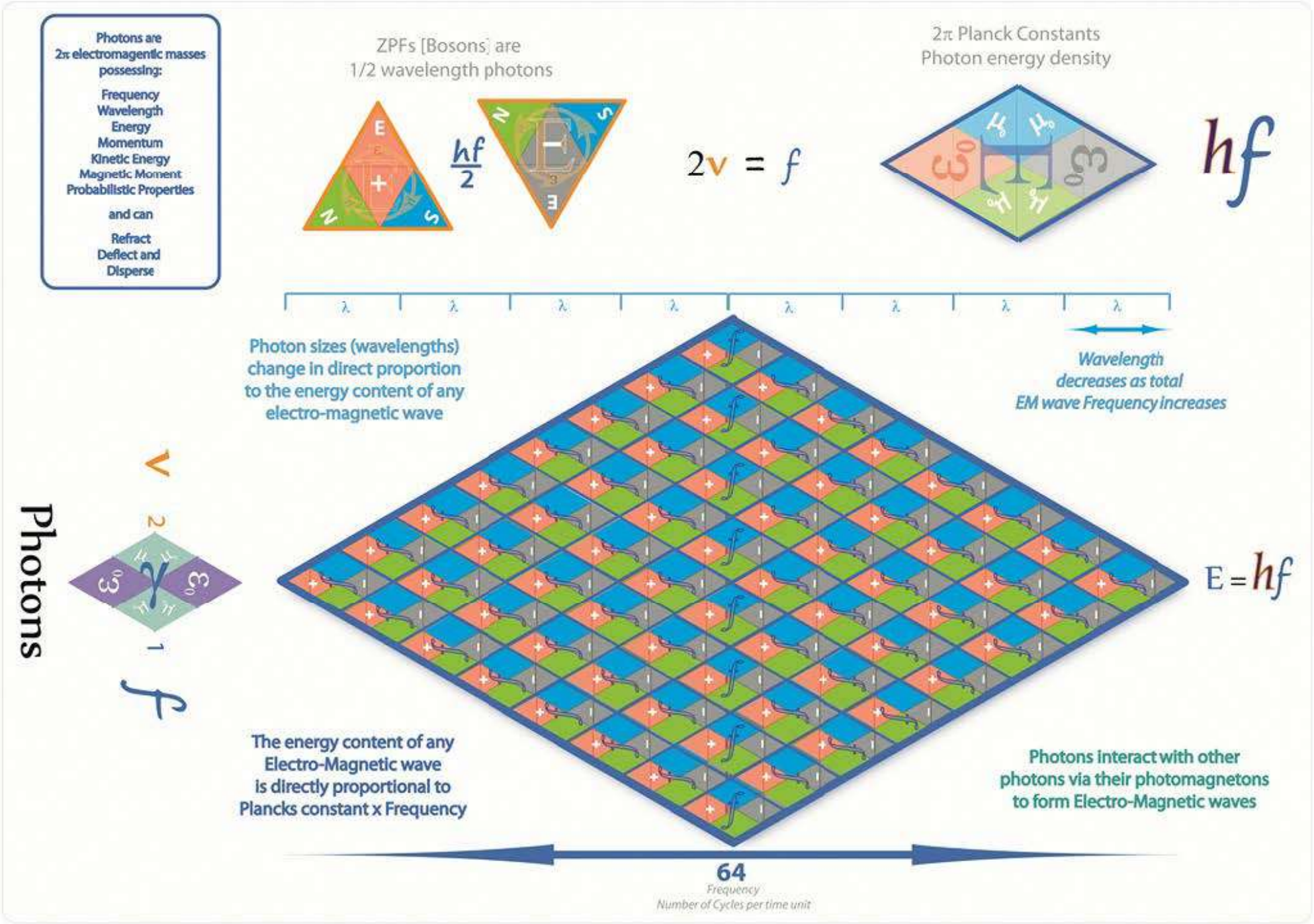

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Bosons in a EM wave

EM waves are comprised of transverse W Bosons

Odd numbers totaling to a Square number

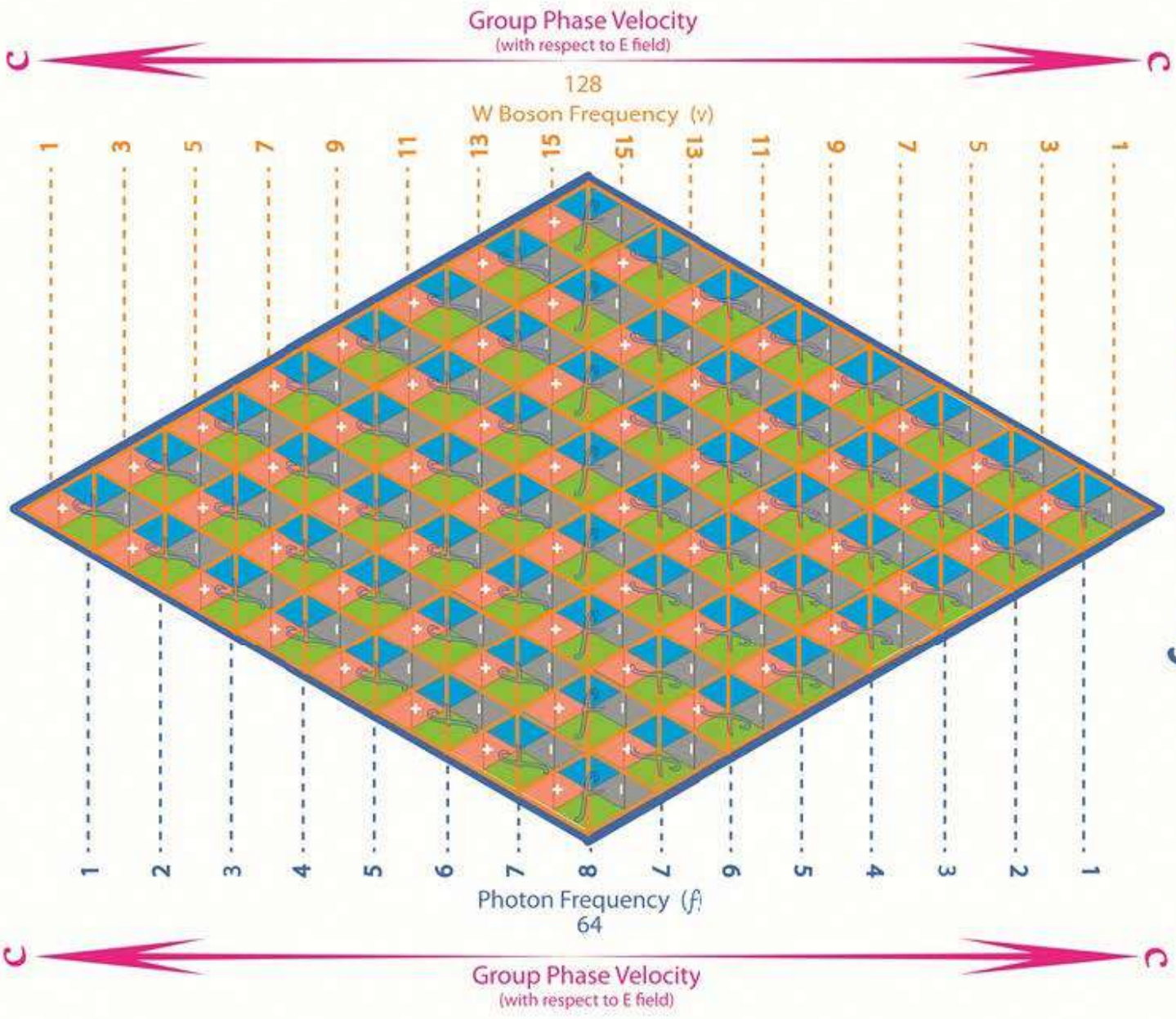
$E = h\nu$

$2\nu = f$

$E = hf$

Even numbers totaling to a Square number

EM waves are also comprised of longitudinal Photons


Group Phase Velocity
(with respect to E field)
c
c
128
W Boson Frequency (ν)
1 3 5 7 9 11 13 15 15 13 11 9 7 5 3 1
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
Photon Frequency (f)
64
c
c
Group Phase Velocity
(with respect to E field)

$2h\nu = E = hf$

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[Bosons]

ODD π

(1,3,5,7,9, ...)

Z BOSONS are 1/2 wavelength quantum levels

$E = h\nu$

vs.

1:1

PHOTONS are integer wavelength frequencies

$E = hf$

[Photons]

EVEN π

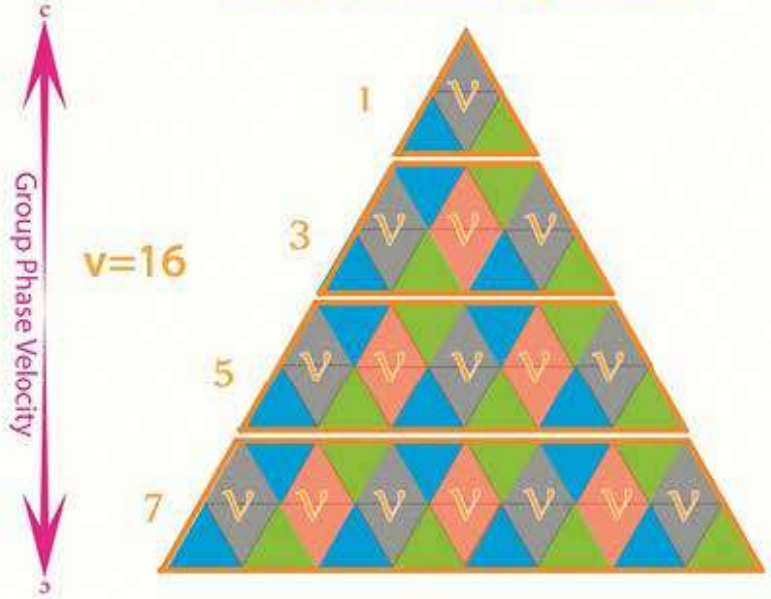
(2,4,6,8,10, ...)

$$1\pi_{\text{Bosons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta

ElectroMagnetic · mass · velocity

ZPFs are Boson quantums



$$\text{ODD}\pi_{\text{Bosons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta

ElectroMagnetic · mass · velocity

Charges are comprised of transverse Bosons

Bosons and Photons have differing EM geometries

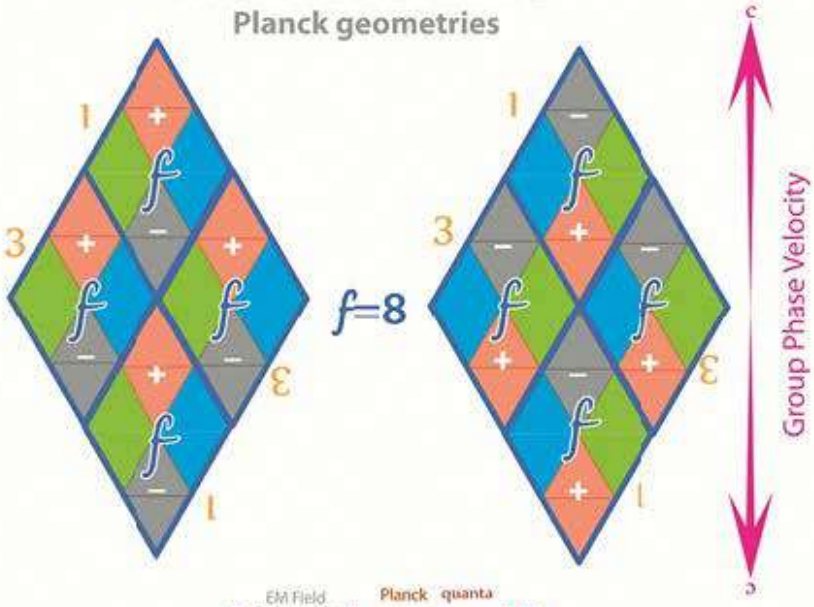
$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta

ElectroMagnetic · mass · velocity

Photons are comprised of Bosons

Photons are EVEN number Planck geometries



$$\text{EVEN}\pi_{\text{EM waves}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta

ElectroMagnetic · mass · velocity

EM waves are comprised of longitudinal Photons

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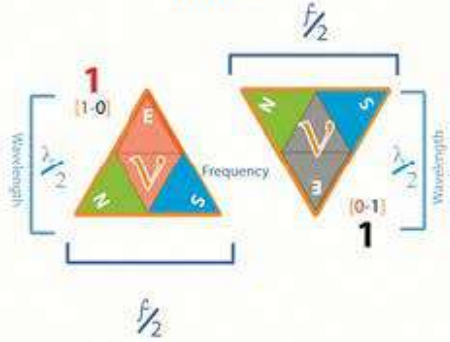
ZPF Wavelet



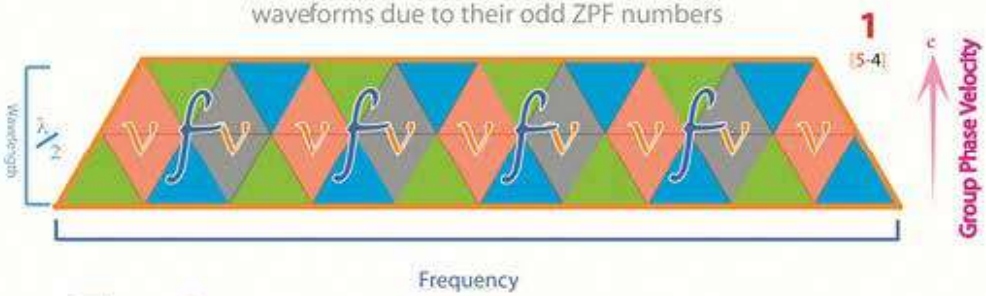
Bosons

Charge Carriers

$E = h\nu$

W+ boson

Bosons are half wavelength - non-Integer frequency waveforms due to their odd ZPF numbers



$$m\nu^2 = E = h\nu^2$$

All Bosons are transverse ODD quanta EM masses

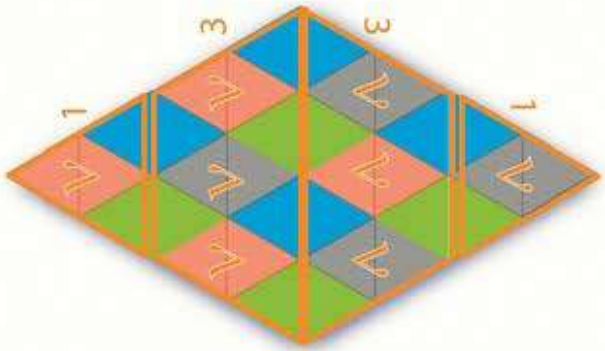
The interchanging of Quantum number [ν]

$$2\nu = f$$

with Photon Frequency [f] is a cause of confusion

All Photons are longitudinal EVEN quanta EM masses

Transverse Bosons



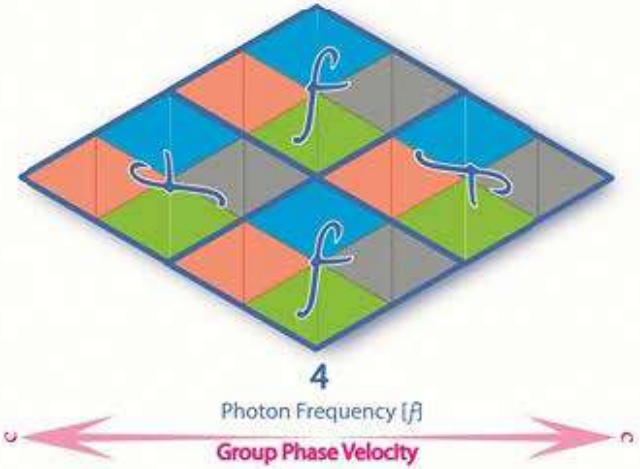
$$2h\nu = E = hf$$

EM Force Carriers

$E = hf$

Photons

Longitudinal Photons



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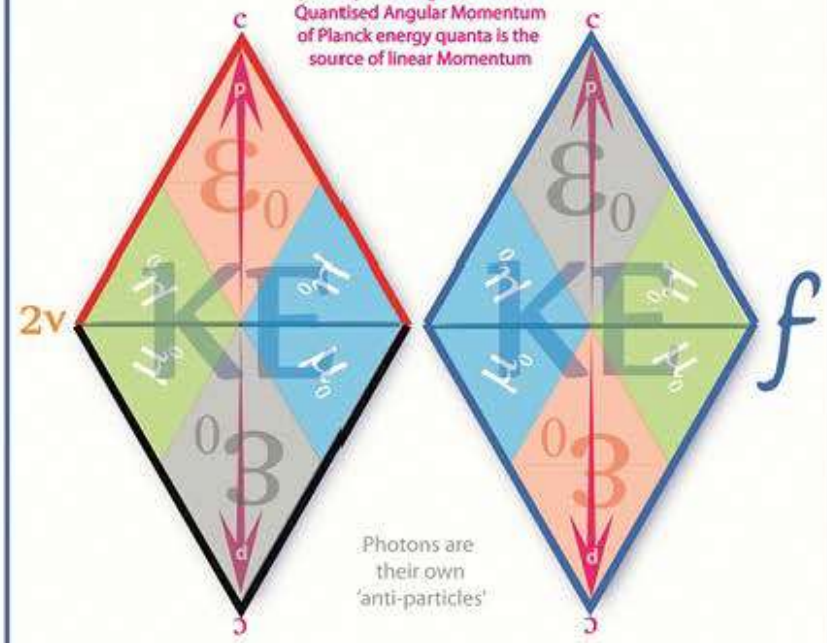
Photonic Energies

$$2p^2 = KE = 2mv^2$$

The equilateral geometries of Quantised Angular Momentum of Planck energy quanta is the source of linear Momentum



$$2h\nu = E = hf$$

$$E_\gamma = 2mc^2$$

As Photons are 2D EM energy waveforms they should always be referred to as having EM mass-energy equivalence

γ

$$2\pi\left[m\Omega v^2\right]$$

mass velocity; Planck quanta

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field; Planck quanta; ElectroMagnetic; mass; velocity

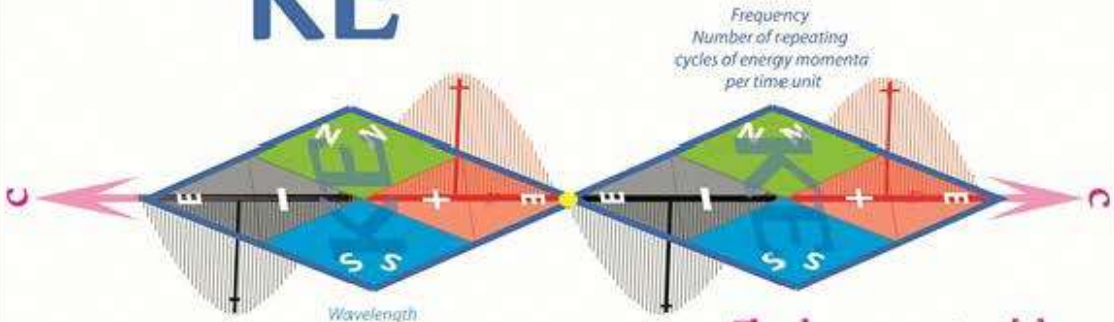
Photons are kinetic energy [KE] wave packets:

$KE = (1/2) * m_\gamma * v^2$

$= 1/2 * (E/c^2) * c^2$

$= E/2$

KE


Frequency
Number of repeating cycles of energy momenta per time unit
c
c
Wavelength decreases as Photon internal Frequency increases

They have momentum [p]:

$p = m_\gamma * v$

$= (E/c^2) * c$

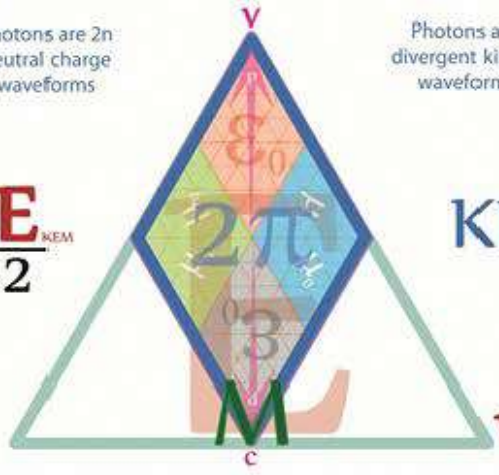
$= E * c$

0

[v-v]

Photons are 2n neutral charge waveforms

Photons are divergent kinetic waveforms



$KE = \frac{E_{KEM}}{2}$

$KE = \frac{1}{2}Mv^2$

v^2

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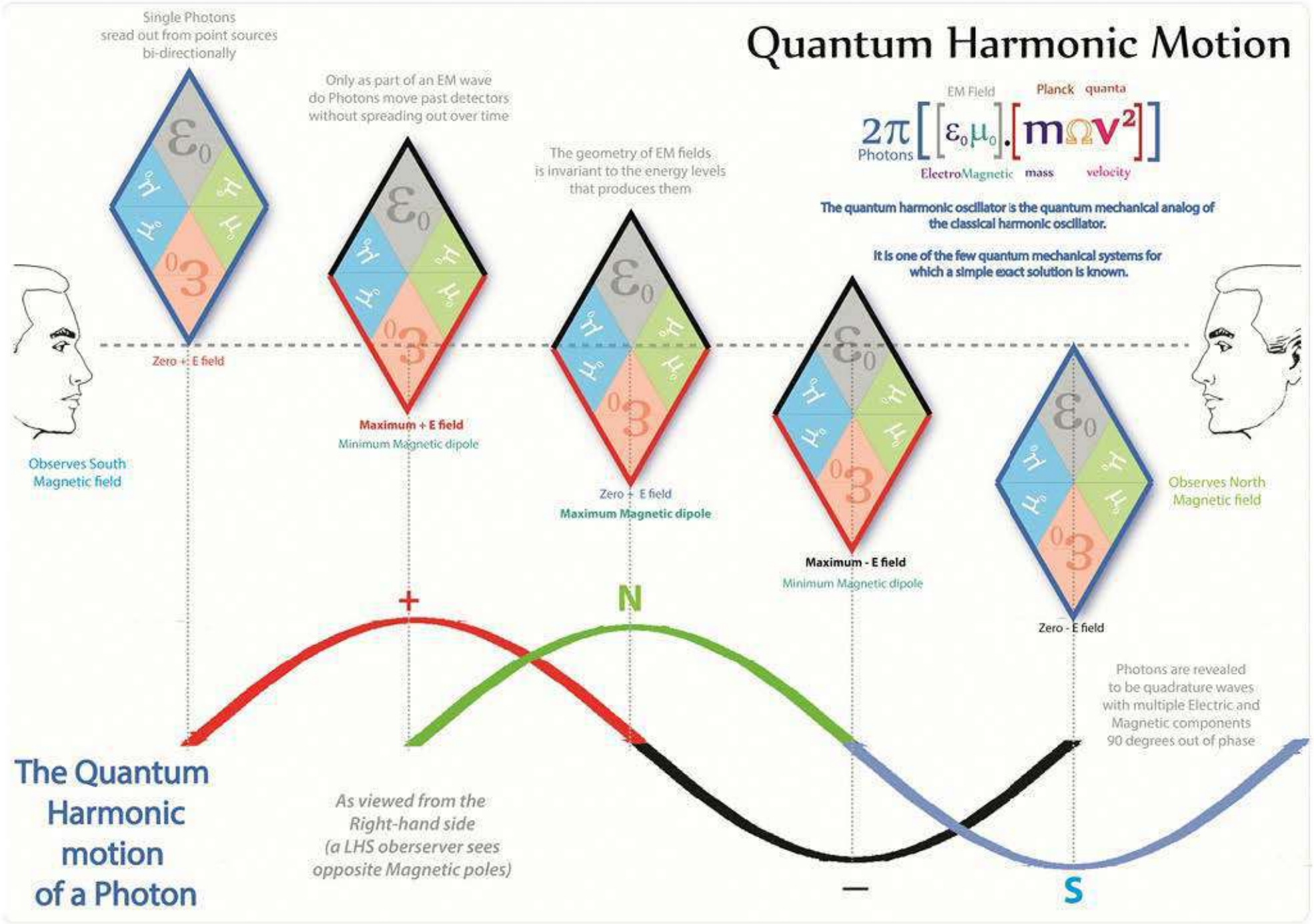
Quantum Harmonic Motion
EM Field
Planck quanta
$2\pi_{\text{Photons}}[[\varepsilon_0\mu_0].[m\Omega v^2]]$
ElectroMagnetic mass velocity
The quantum harmonic oscillator is the quantum mechanical analog of the classical harmonic oscillator.
It is one of the few quantum mechanical systems for which a simple exact solution is known.
Single Photons sread out from point sources bi-directionally
Only as part of an EM wave do Photons move past detectors without spreading out over time
The geometry of EM fields is invariant to the energy levels that produces them
Zero + E field
Maximum + E field
Minimum Magnetic dipole
Zero + E field
Maximum Magnetic dipole
Maximum - E field
Minimum Magnetic dipole
Zero - E field
Observes South Magnetic field
Observes North Magnetic field
+
N
—
S
Photons are revealed to be quadrature waves with multiple Electric and Magnetic components 90 degrees out of phase
The Quantum Harmonic motion of a Photon
As viewed from the Right-hand side (a LHS oberserver sees opposite Magnetic poles)

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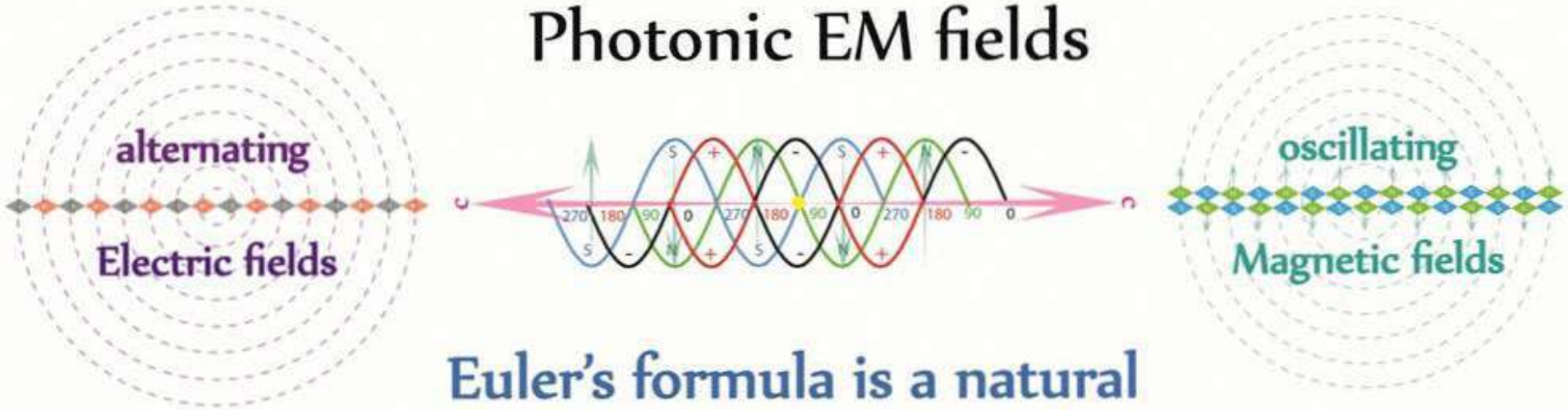
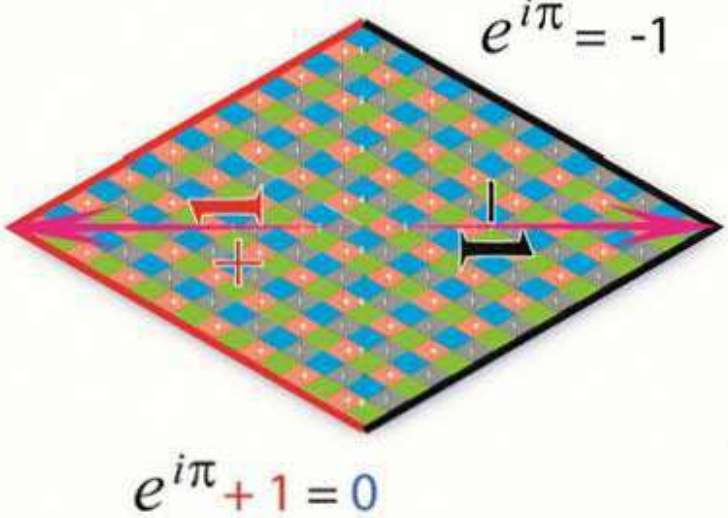
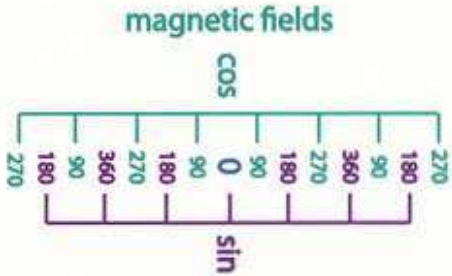
Photonic EM fields



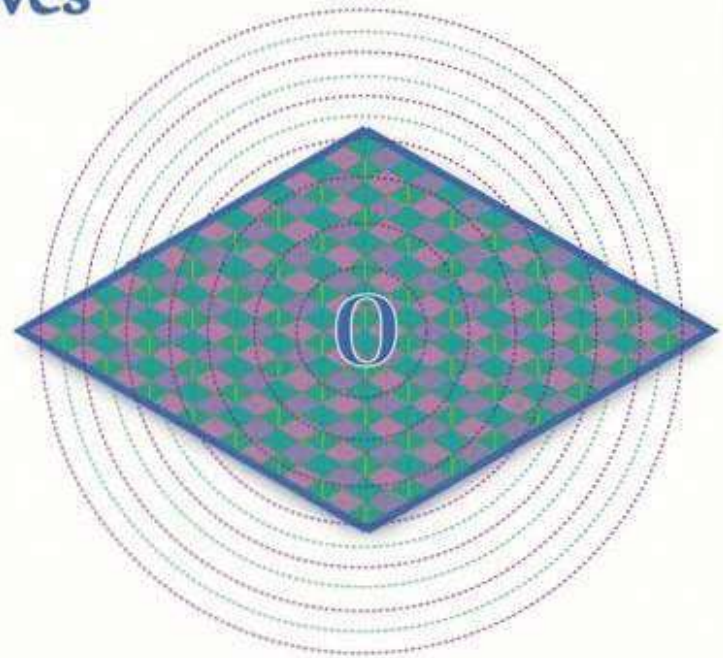
Euler's formula is a natural geometric expression of electromagnetic waves



$$e^{ix} = \cos x + i \sin x$$



Every field geometry in a EM wave is 90 degrees out of phase with the E or M field adjacent to it



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Euler's Formula

$$e^{i\pi} = -1$$

$$e^{i\pi} + 1 = 0$$

Euler's formula is often considered to be the basis of the complex number system. In deriving this formula, Euler established a relationship between the trigonometric functions, sine and cosine, and e raised to a power

$$e^{ix} = \cos(x) + i\sin(x)$$

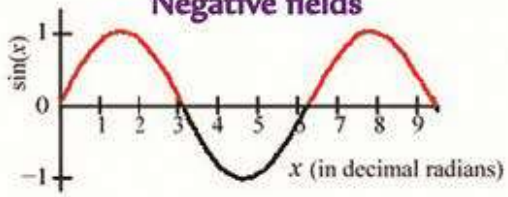
a mathematical description of EM-Energy waveforms

adjacent EM fields are 90-180° out of phase

Leonhard Euler

(15 April 1707 – 18 September 1783)

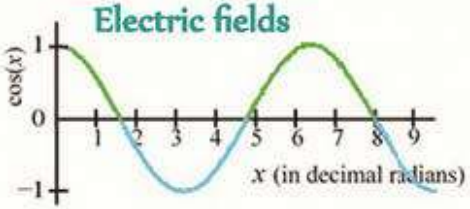
Positive E-fields are out of phase with Negative fields



$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \ldots$$

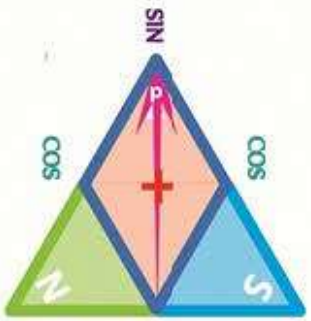
$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \ldots$$

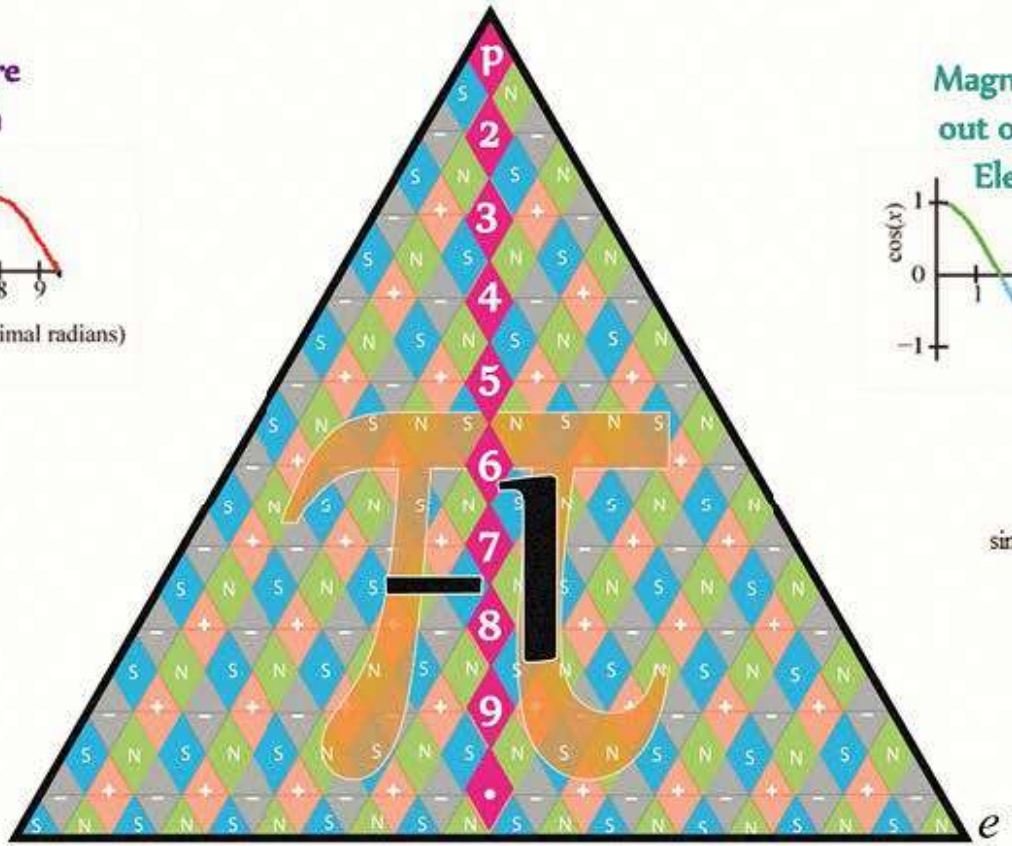
Magnetic fields are out of phase with Electric fields



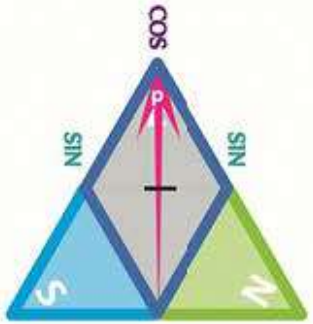
$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \ldots$$

$$\sin x + \cos x = 1 + x - \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \ldots$$





The above geometry is reflective of negative charge energy momenta Planck geometries
the momentum of the nett charged geometry is the Square root of Negative 1



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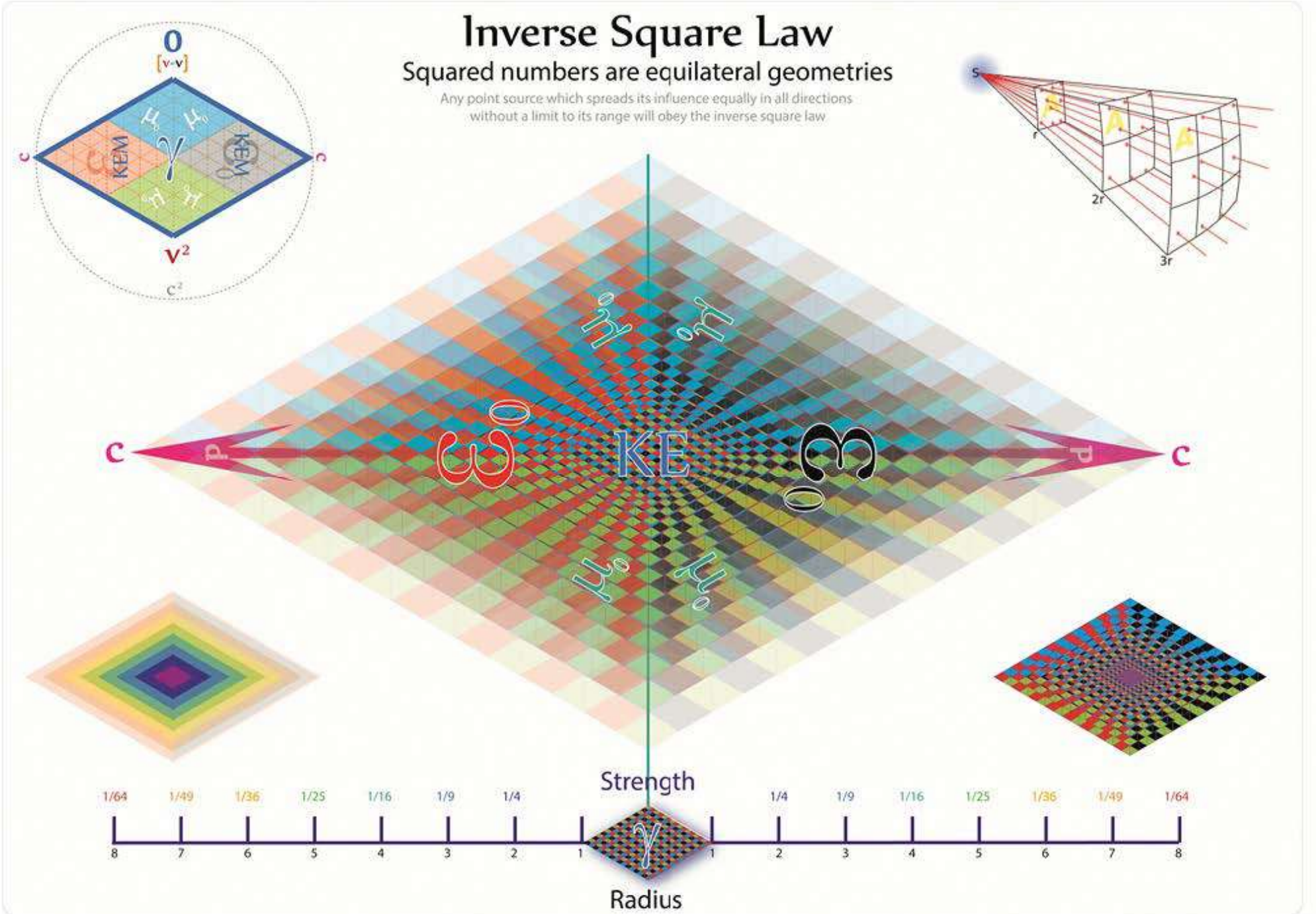

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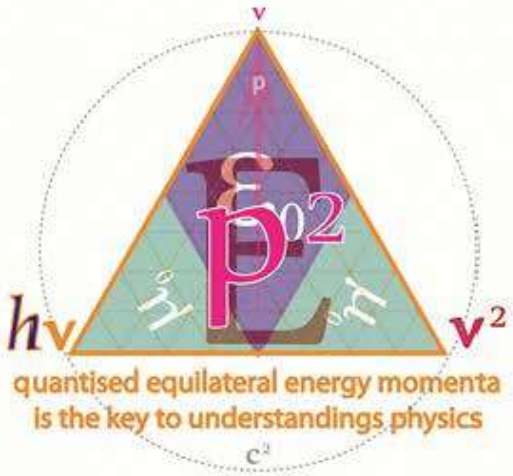
$$n\pi \left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta · mass · ElectroMagnetic mass · velocity

Throughout history Physicists have sought relationships between EM mass-Energy and momenta in an attempt to discern the true Nature of these physical properties



mass-Energy momenta

$$E$$

Energy

$$kg\,\frac{m^2}{s^2}$$

$$E = mv \qquad E = mv^2 \qquad v = \frac{1}{\sqrt{\varepsilon_0\mu_0}}$$

Newton *Leibnitz* *Maxwell*

Velocity of Light

$$v = \left[\left[\frac{c^2}{\Omega}\right]\cdot\left[\frac{\Omega}{c}\right]\right]$$

f Scalar Frequency · λ Linear Wavelength

Planck *Einstein* *de Broglie*

$E = h\nu$ $E = hf$ h/p

Planck's Constant

$$kg\,\frac{m^2}{s}$$

Compton Frequency

$$\left[\frac{E}{h}\right]$$

de Broglie wavelength

$$\left[\frac{E}{p}\right]$$

Wavelength

$$p$$

Linear momentum

$$kg\,\frac{m}{s}$$

Ryberg wavenumber

$$\left[\frac{p}{E}\right]$$

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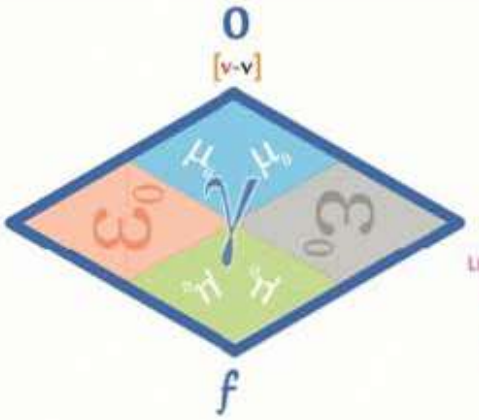
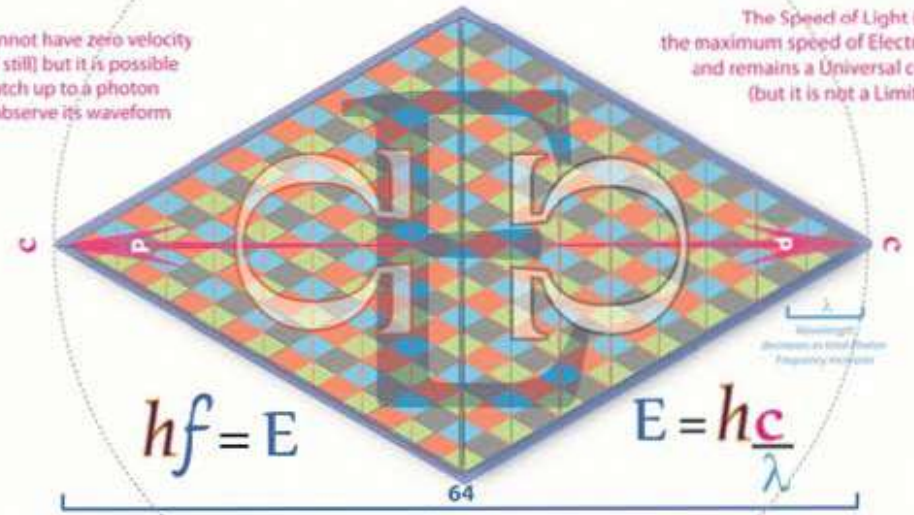


$$mv^2 = KE = hv^2$$

All Photons contain Energy momenta
and therefore have electromagnetic mass
but they are 'Matterless' geometries

Light cannot have zero velocity
[stand still] but it is possible
to catch up to a photon
and observe its waveform

The Speed of Light is
the maximum speed of Electrical energy
and remains a Universal constant
(but it is not a Limit)



$hf = E$

$E = h\frac{c}{\lambda}$

c^2

Wavenumber

$$\frac{m}{s}\cdot\frac{s}{m^2}\left[\frac{c}{\Omega}\right]\frac{1}{m}$$

Celeritas

[Frequency x Wavelength]

EM waves are typically described through any of their following three physical properties:

frequency *f*,
wavelength λ, or
photon energy E

ElectroMagnetic Fields

$\varepsilon_0\mu_0 = \frac{1}{c^2}$

1.112650056 e-17 $\frac{s^2}{m^2}$

Frequency, momentum, and Wavelength are all related through the geometries of c & c²

Velocity of Light

$$c = \left[\left[\frac{c^2}{\Omega}\right]\cdot\left[\frac{\Omega}{c}\right]\right]$$

f Frequency

λ Wavelength

$v = \frac{1}{\sqrt{\varepsilon_0\mu_0}}$

λ

$$m\left[\frac{\Omega}{c}\right]\frac{m^2}{s}\cdot\frac{s}{m}$$

Wavelength

f

$$\frac{m^2}{s^2}\cdot\frac{s}{m^2}\left[\frac{c^2}{\Omega}\right]\frac{1}{s}$$

Frequency

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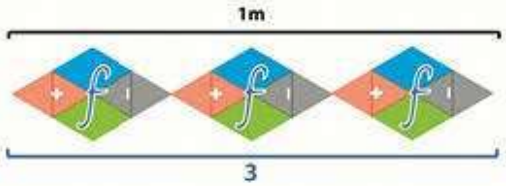
Frequency is the number of neutral quanta sets repeating per unit time in a EM wave



EM waves frequencies [photon number] change in direct proportion to the energy content of any electromagnetic wave

The specific wavelengths and frequencies of energy momenta in KEM fields form the basis for Spectral emission/absorption lines [care must be always taken to specify if quanta or photons are being measured]

$2v = f$

$E = hv$

Bosons are charged transverse energy momenta quanta

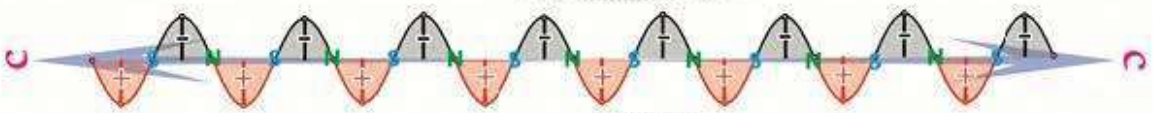
2 charge quanta

Photons are neutral longitudinal energy momenta waveforms

1 Photon

$E = hf$

c^2



Frequency
(Number of Neutral ZPE sets per unit of time)

Irrespective of whether its measured as a transverse or longitudinal electromagnetic wave

Frequency is the inverse of Charge

$$f \left[\frac{c^2}{\Omega}\right]$$

Frequency

is directly related to the nett quantised angular momentum of any space time geometry

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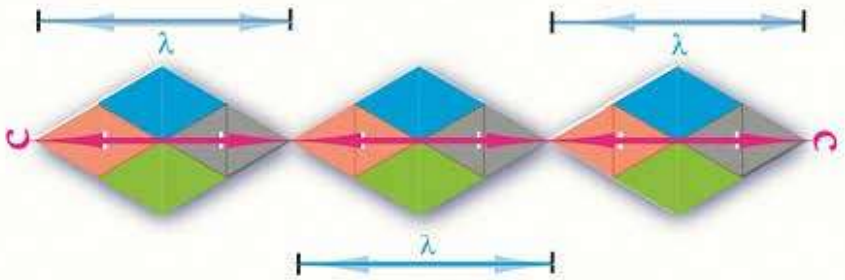
λ

Wavelength

Wavelength is a measure of the distance between repetitions of geometric features such as maximums, minimums, or zero-points of Electric and Magnetic fields



$\tilde{\nu}$

Wavelengths are the inverse of Wavenumbers

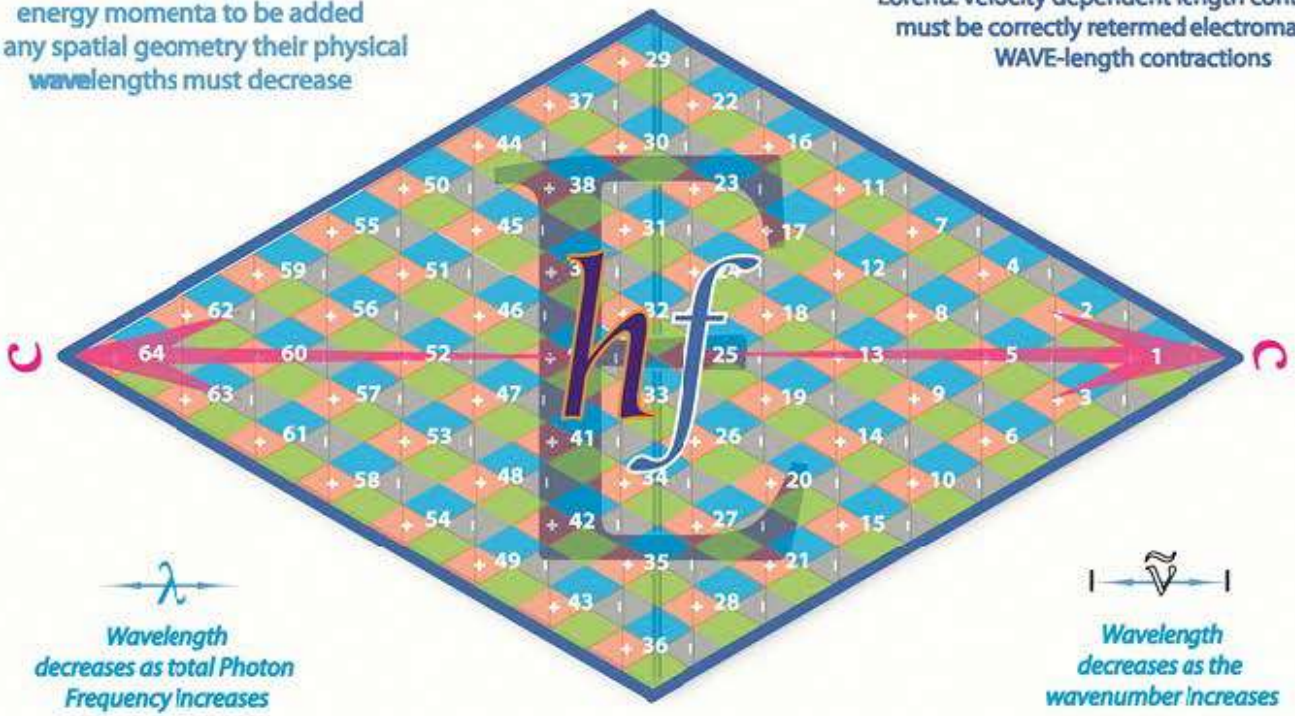
λ

For additional quantised energy momenta to be added to any spatial geometry their physical wavelengths must decrease

Lorentz velocity dependent length contractions must be correctly retermed electromagnetic WAVE-length contractions

$$\lambda \left[\frac{\Omega}{c}\right]$$

Wavelength



λ

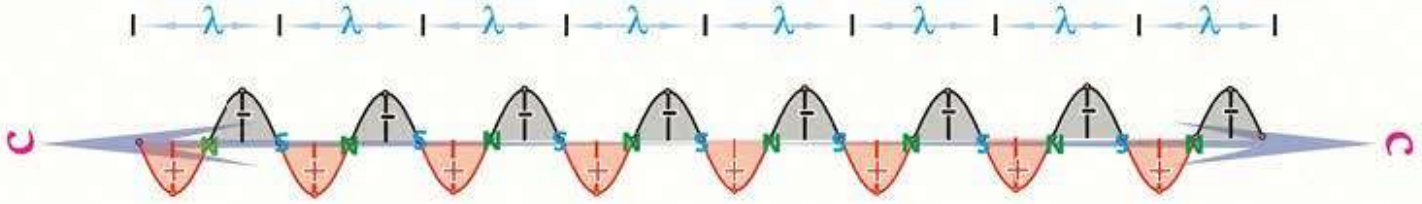
Wavelength decreases as total Photon Frequency increases

$\tilde{\nu}$

Wavelength decreases as the wavenumber increases

In physics, the wavelength of a sinusoidal wave is the spatial period of the wave – the distance over which the wave's shape repeats. It is usually determined by considering the distance between consecutive corresponding points of the same phase, such as crests, troughs, or zero crossings, and is a characteristic of both traveling waves and standing waves, as well as other spatial wave patterns.

The concept can also be applied to periodic complex or non-sinusoidal waves



299,792,458
linear metres per second

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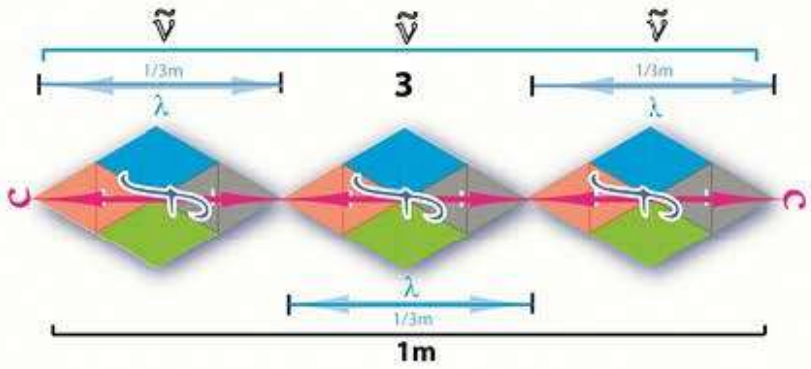
Wavenumbers

$\tilde{\nu}$

Wavenumbers are the inverse of Wavelengths

λ



Wavenumbers are the spatial equivalent of Frequency

$$\left[\frac{c}{\Omega}\right]$$

$$\lambda$$

$$\left[\frac{\Omega}{c}\right]$$

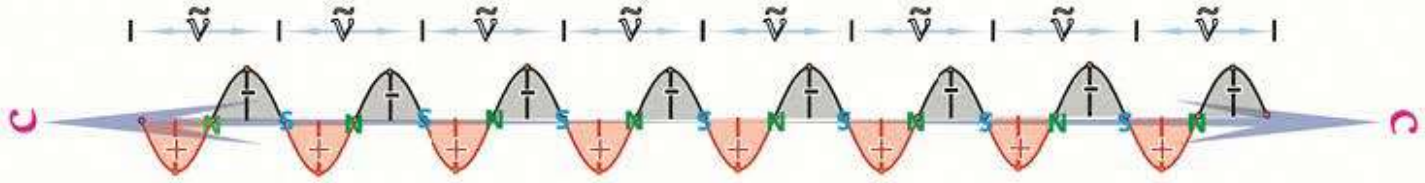
Wavelength and Frequency are related to the group velocity of quanta in an EM wave

$$\tilde{\nu} = 1/\lambda$$

Wavenumbers are inversely proportional to Wavelengths

Wavelength decreases as Frequency increases

Wavenumbers decrease as the wavelengths increase



299,792,458
linear metres per second

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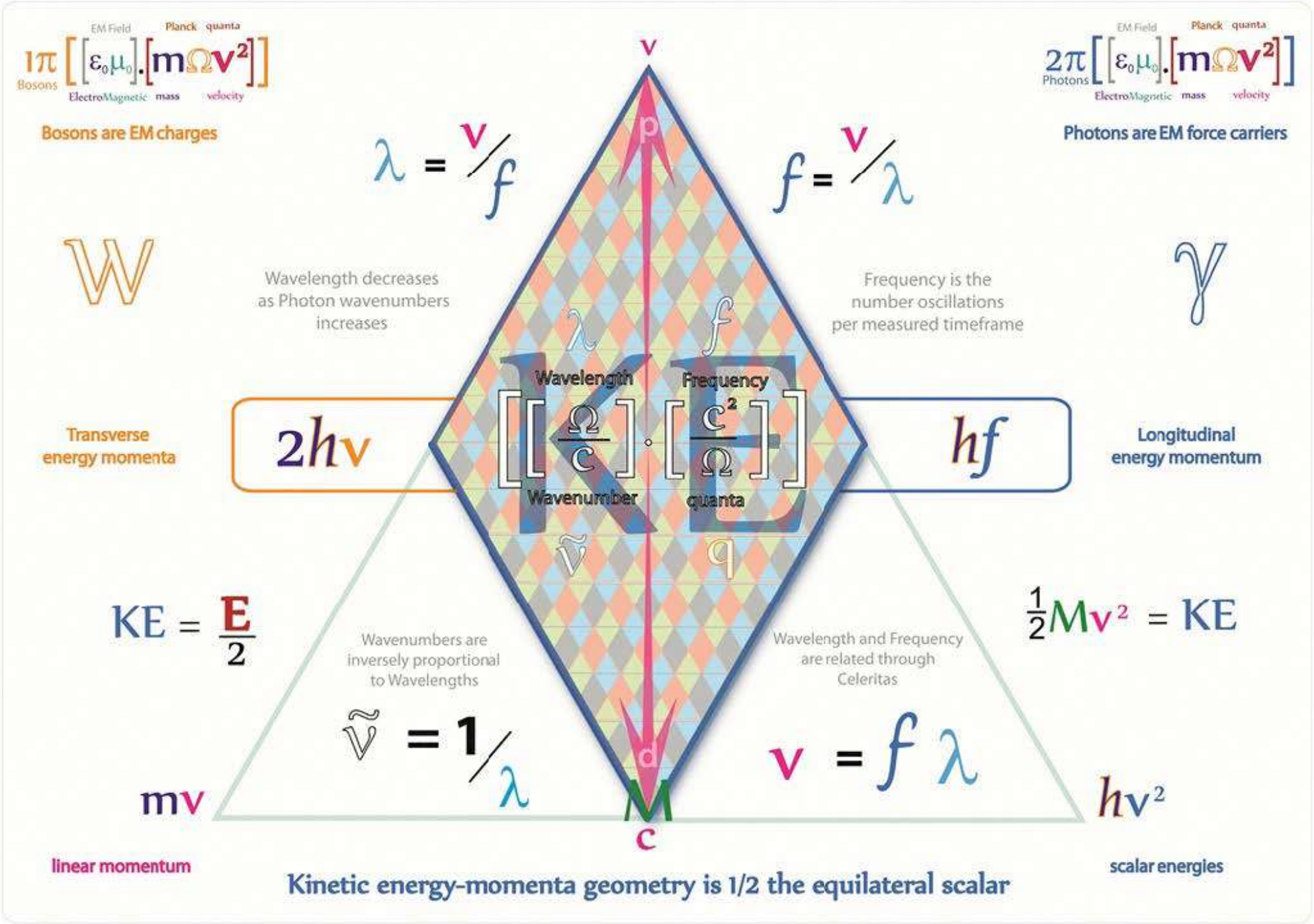

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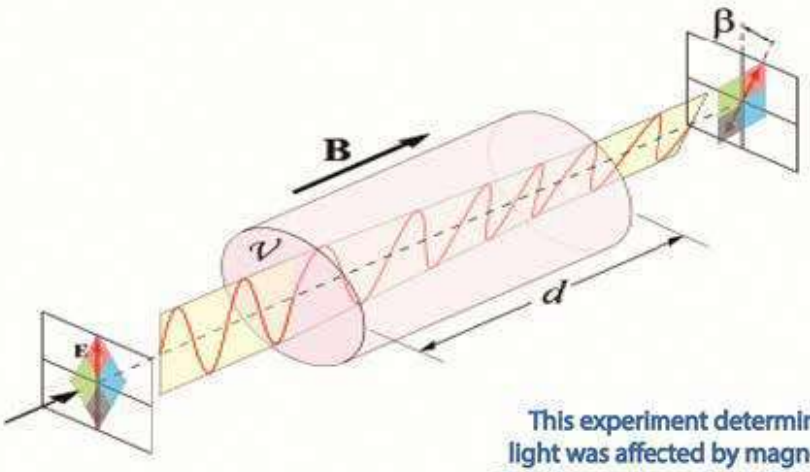
Faraday Rotation

The Faraday effect or Faraday rotation is a Magneto-optical phenomenon, that is, an interaction between light and a magnetic field in a medium. The Faraday effect causes a rotation of the plane of polarization which is linearly proportional to the component of the magnetic field in the direction of propagation.



Discovered by Michael Faraday in 1845, the Faraday effect was the first experimental evidence that light and electromagnetism are related

Faraday summarized the entire effect as follows:

"Magnetic lines, then, in passing through silicated borate of lead, and a great number of other substances, cause these bodies to act upon a polarized ray of light when the lines are parallel to the ray, or in proportion as they are parallel to it: if they are perpendicular to the ray, they have no action upon it.

They give the diamagnetic the power of rotating the ray; and the law of this action on light is, that if a magnetic line of force be going from a north pole, or coming from a south pole, along the path of a polarized ray coming to the observer, it will rotate that ray to the right-hand; or, that if such a line of force be coming from a north pole, or going from a south pole, it will rotate such a ray to the left hand."

Michael Faraday

(22 September 1791 – 25 August 1867)

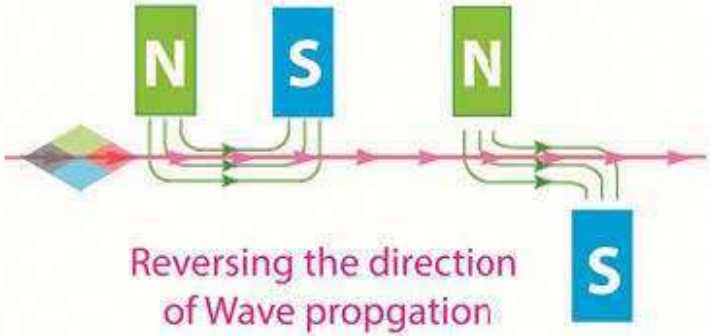
This experiment determined that light was affected by magnetic force. This "magneto-optical effect" was later termed the Faraday effect.

Faraday experimented with other substances that yielded similar results.

The resultant effect he termed "diamagnetism" concluding that magnetism was an inherent property of all EM mass-ENERGY-Matter

Before the Magnetic field

After the Magnetic field



Reversing the direction of Wave propgation reverses the rotation effected by the external magnetic field

Evan's Photomagneton

A photon has a magnetic dipole. It is an elementary magnet. Evans discovery of the photon's longitudinal magnetic field in 1992 is as significant, as Einstein's discovery of relativity.

It helps in giving a physical interpretation of wave mechanics, two-slit interference and the Faraday effect,

all accounted for in Tetryonic Theory.

Every Photon and EM wave has polarised magnetic apexes as a result of the Planck quanta constituing them (creating Magnetic moments)

These Photo-Magnetic Moments allow for the interaction of Photons with external magnetic fields resulting in Faraday rotation of Photons and EM fields

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Isaac Newton allowed sunlight from a small, circular hole to fall on a prism, producing a rainbow of color. Although the production of a rainbow by a clear crystal was known to the ancients, it was Newton who showed that the colors did not originate in the crystal, but rather were components of sunlight.

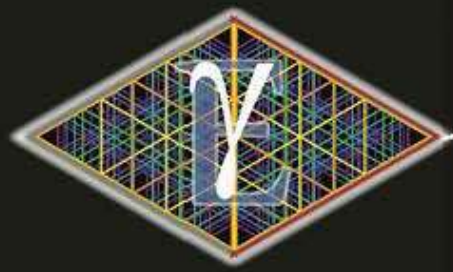
Spectral colours

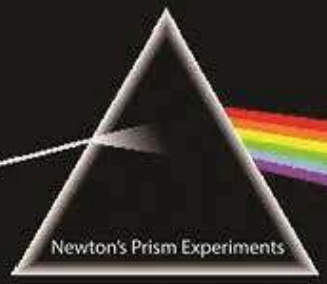
William Herschel:
The Discovery of Infrared Light

White Light is comprised of many coloured corpusles

Refracting Prism

White Light





This array of colors he called a spectrum.

Red
Orange
Yellow
Green
Aqua
Blue
Indigo
Violet

Johann Ritter:
The Discovery of Ultraviolet Light

White Light is the result of superpositioned EM waves of differing wavelength Photons

Thomas Young discovered interference patterns caused by light passing through a narrow slit. Up until this point, the wave theory of light (Huygens) had had nothing convincing to offer in opposition to the particle theory of light (Newton). Now it did, because you cannot explain interference using particles.

The term "light" is often extended to wavelength ranges that the eye cannot detect - to infrared radiation, which has a frequency less than that of visible light, and to ultraviolet radiation, which have a frequency greater than that of visible light.

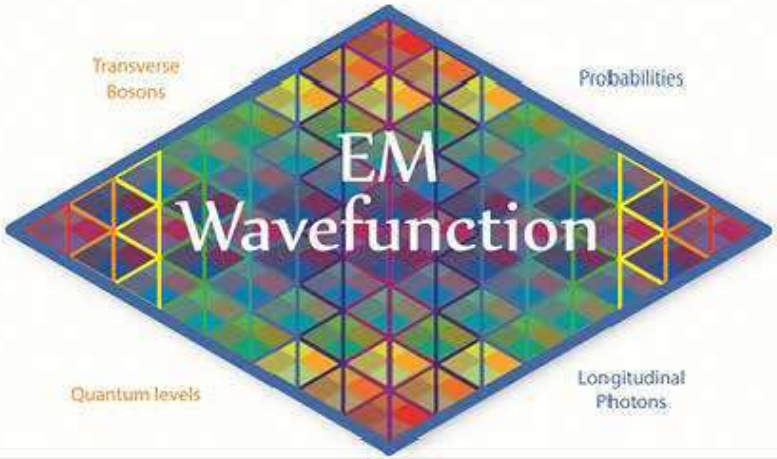
Light has:

Velocity
Angular momenta
Frequency
Wavelength
Relativistic Energy
Linear momentum
Kinetic Energies
Magnetic Moment

and can

Refract
Reflect
Defract
and
Disperse

γ



Ψ

All EM waves possess Wavefunctions describing their probabilistic energy properties

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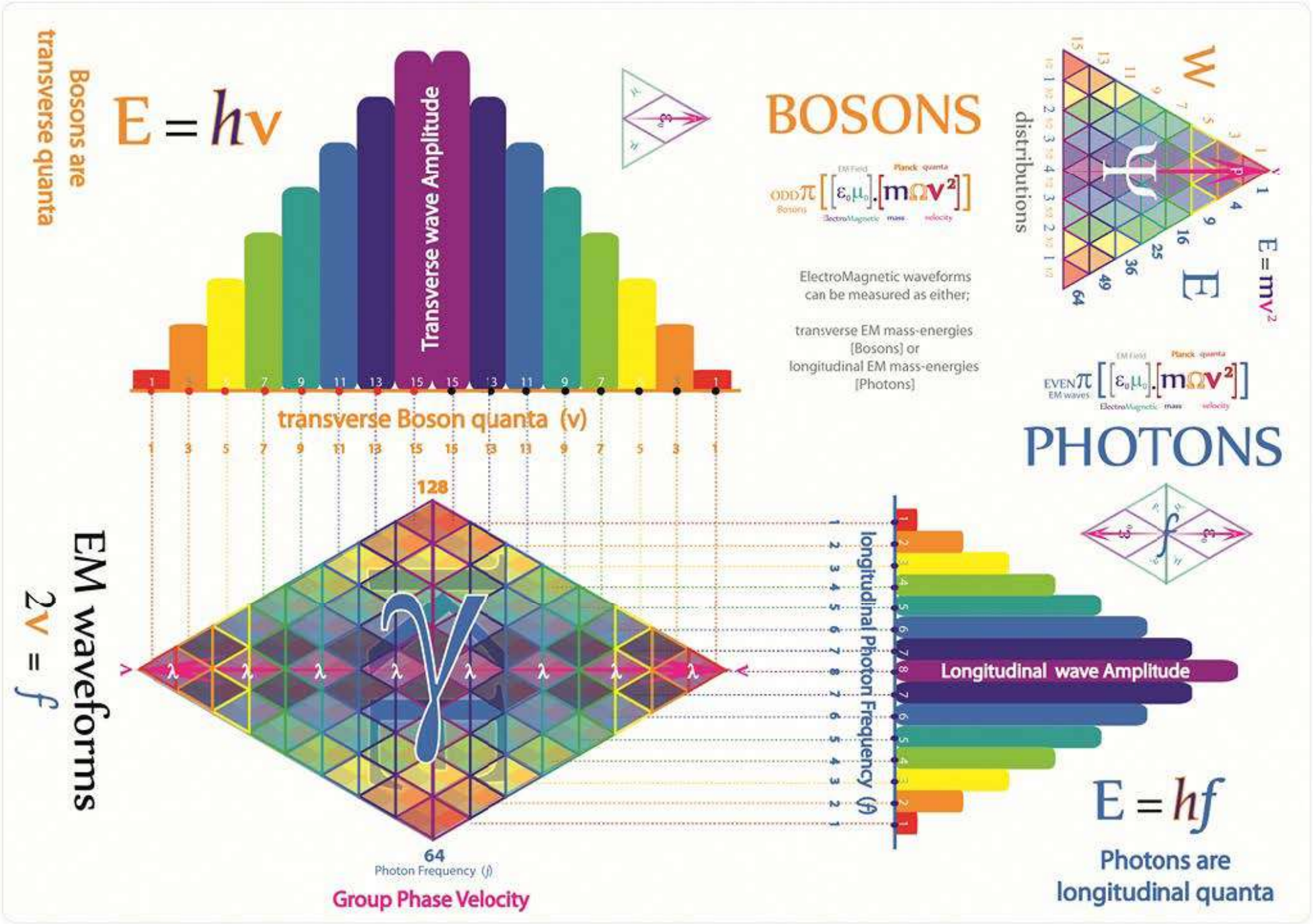

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Wavefunction probabilites

Wave Amplitude

Amplitude = bi-directional Momentum

Probability = [Amplitude]²

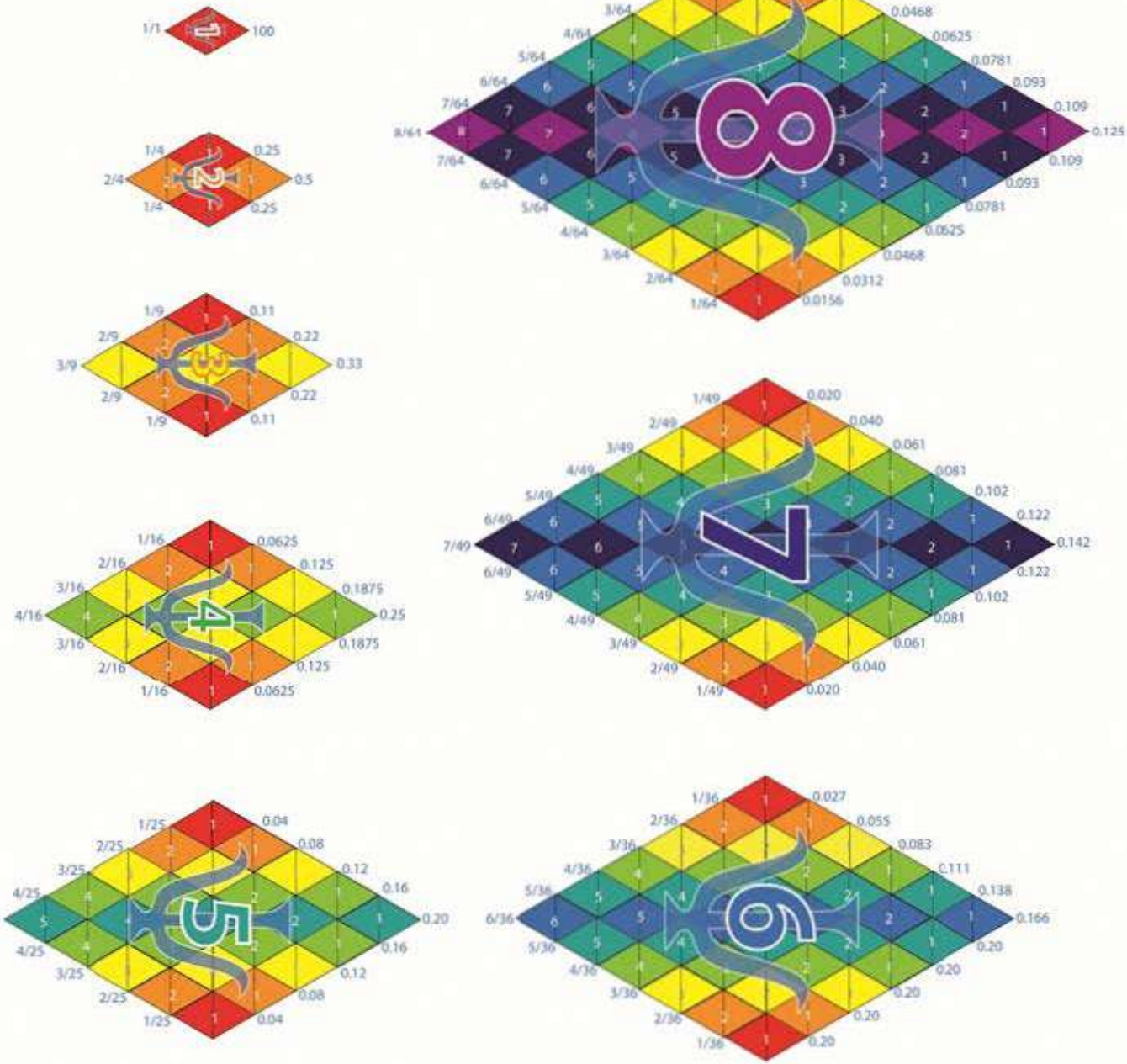
In his 1926 paper, Max Born suggested that the wave function of Schrödinger's wave equation represents the probability density of finding a particle

Probability of finding a Photon in a electromagnetic wave is the Square of its Amplitude

The de Broglie-Schrodinger wave fields should not to be interpreted as a mathematical description of how an event actually takes place in time and space, though, of course, they have reference to such an event.

Rather they are a mathematical description of what we can actually know about the system. They serve only to make statistical statements and predictions of the results of all measurements which we can carry out upon the system.

(Albert Einstein, on Quantum Physics, 1940)



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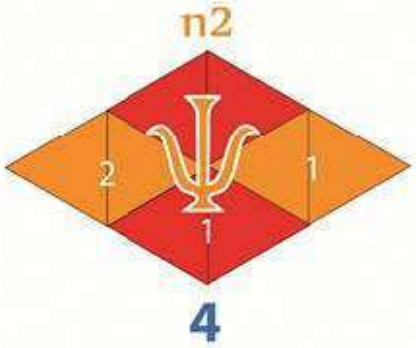
EM radiation patterns

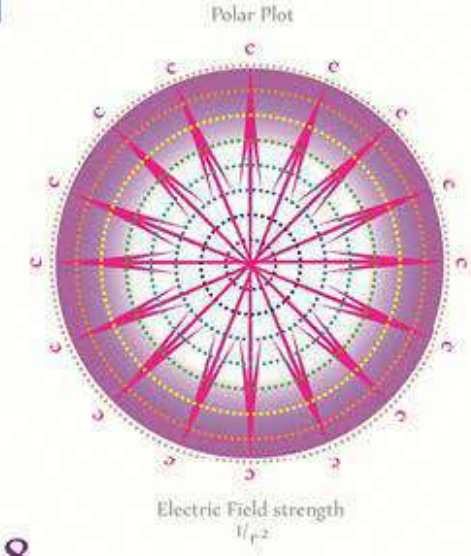
Quantum wavefunctions mathematically model the statistical probability distributions of electromagnetic mass-energy within EM waves



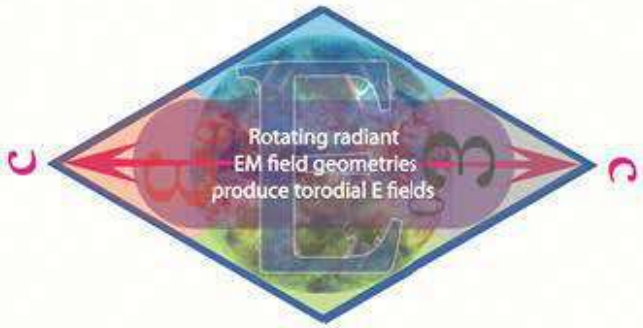
As the energy of an EM wave increases so does its frequency

$E = mv^2$

EM waves radiate outward at the speed of light along their E fields within scribed radial time dependent spatial co-ordinates



$E = hv$



$E = hf$

As the Energy and frequency increase, the Wavelengths of the Photons in a EM wave decreases

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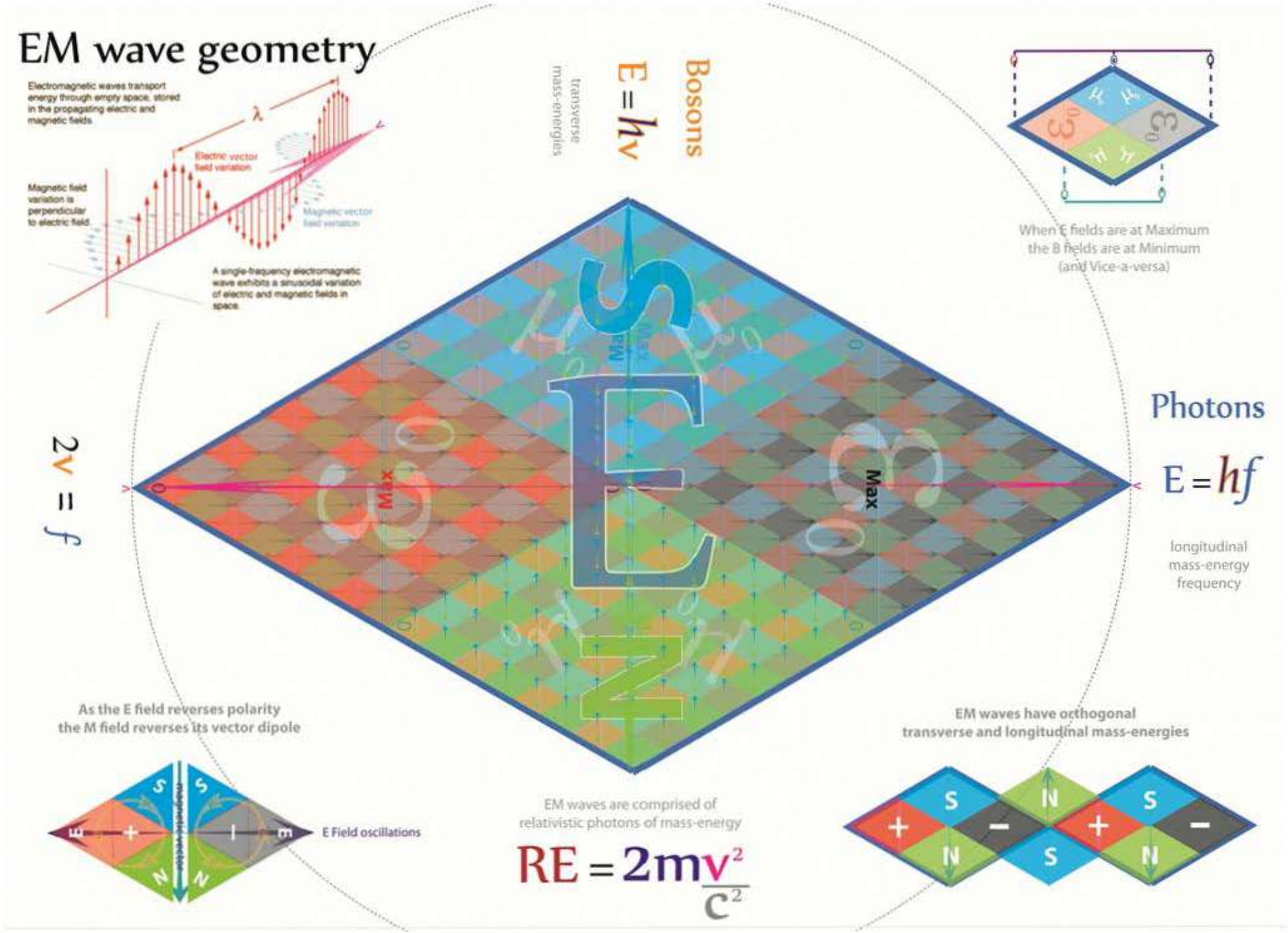
EM wave geometry
Electromagnetic waves transport energy through empty space, stored in the propagating electric and magnetic fields.
λ
Electric vector field variation
Magnetic field variation is perpendicular to electric field.
Magnetic vector field variation
A single-frequency electromagnetic wave exhibits a sinusoidal variation of electric and magnetic fields in space.
Bosons
E = hν
transverse mass-energies
When E fields are at Maximum the B fields are at Minimum (and Vice-a-versa)
Photons
E = hf
longitudinal mass-energy frequency
2v = f
Max
Max
As the E field reverses polarity the M field reverses its vector dipole
E Field oscillations
EM waves are comprised of relativistic photons of mass-energy
RE = 2mv²/c²
EM waves have orthogonal transverse and longitudinal mass-energies

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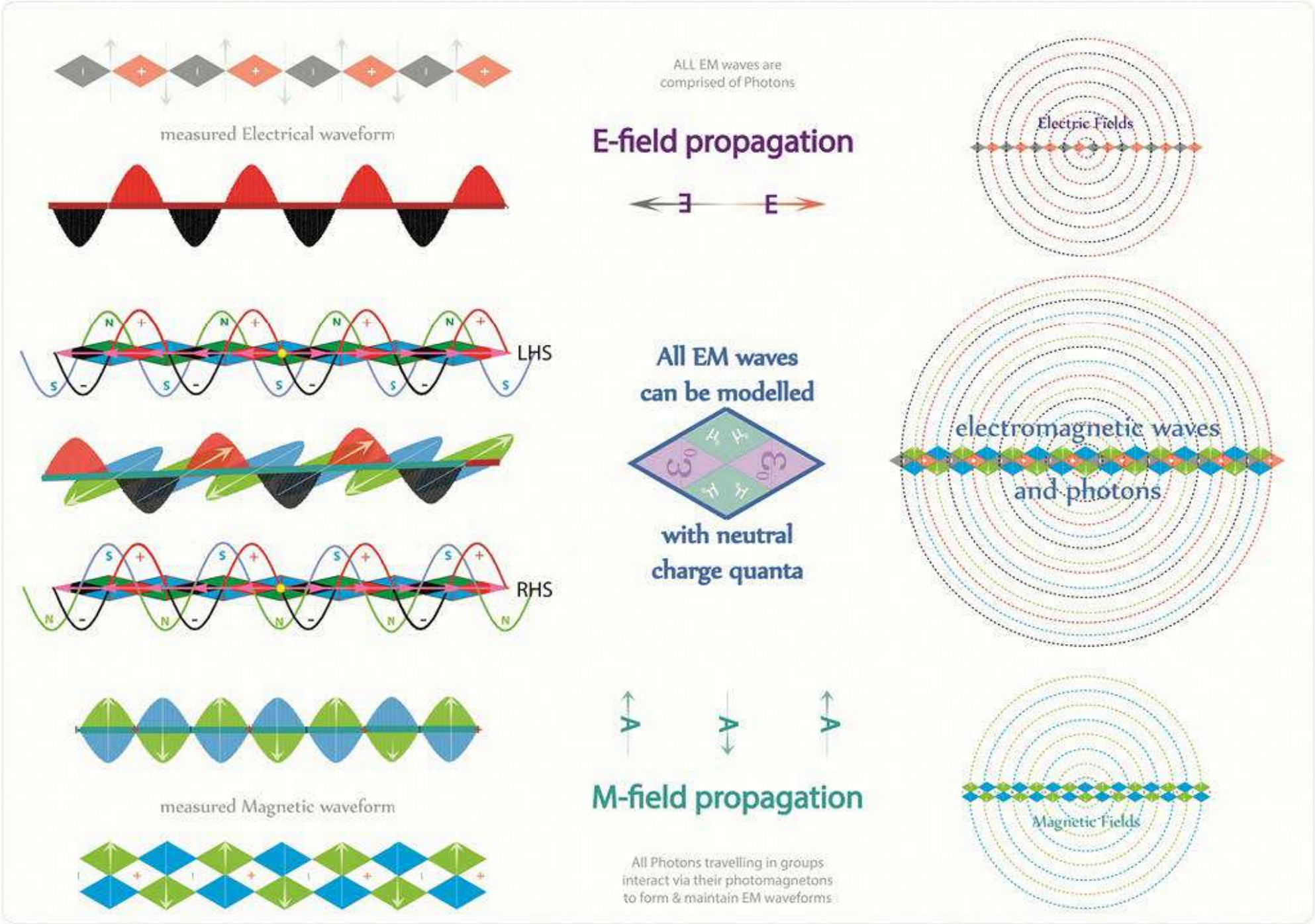
measured Electrical waveform
ALL EM waves are comprised of Photons
E-field propagation
Electric Fields
LHS
All EM waves can be modelled
with neutral charge quanta
electromagnetic waves and photons
RHS
measured Magnetic waveform
M-field propagation
Magnetic Fields
All Photons travelling in groups interact via their photomagnetons to form & maintain EM waveforms

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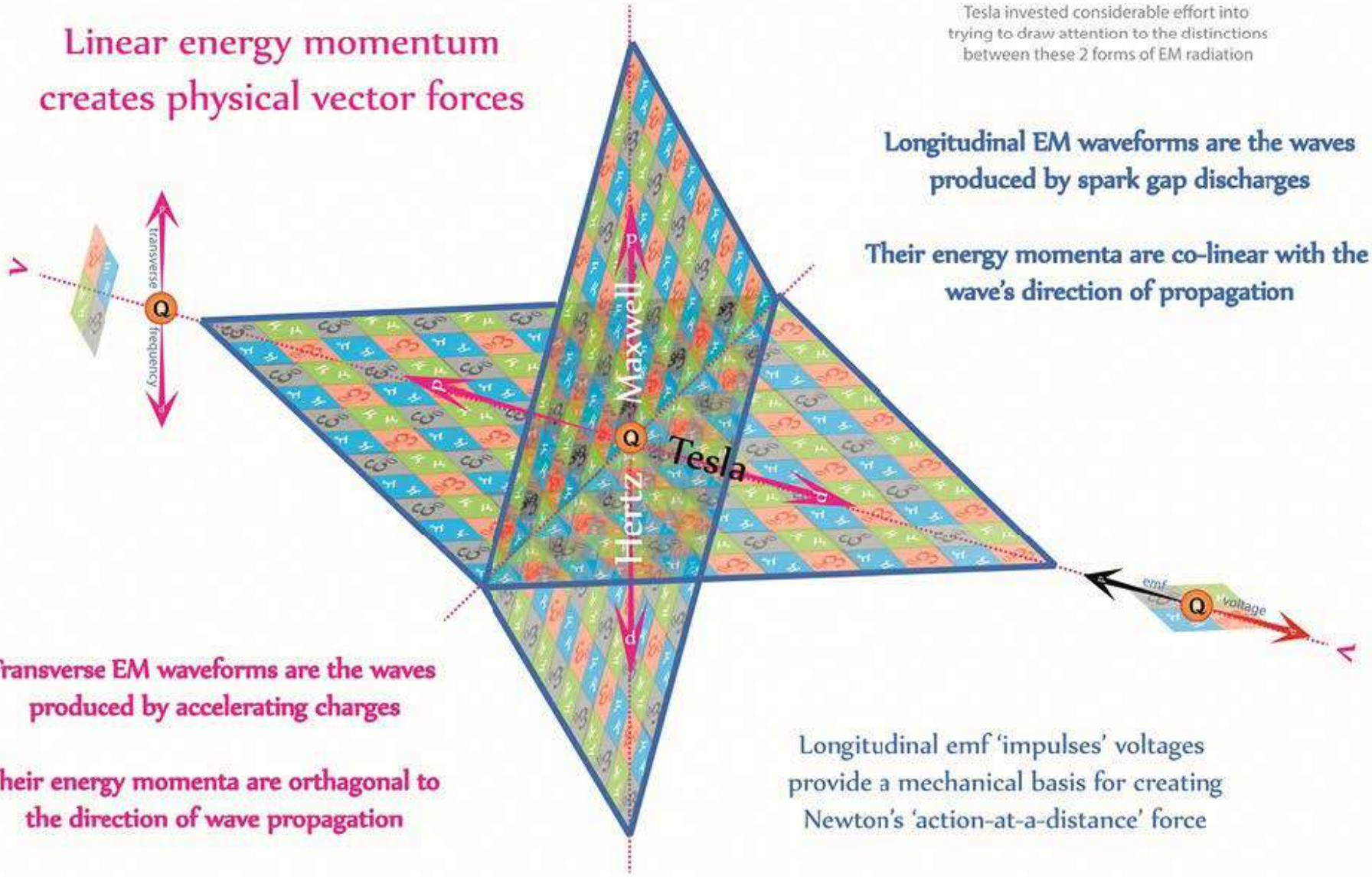
Energy momenta in EM waveforms

Linear energy momentum creates physical vector forces

Tesla invested considerable effort into trying to draw attention to the distinctions between these 2 forms of EM radiation

Longitudinal EM waveforms are the waves produced by spark gap discharges

Their energy momenta are co-linear with the wave's direction of propagation



Transverse EM waveforms are the waves produced by accelerating charges

Their energy momenta are orthagonal to the direction of wave propagation

Longitudinal emf 'impulses' voltages provide a mechanical basis for creating Newton's 'action-at-a-distance' force

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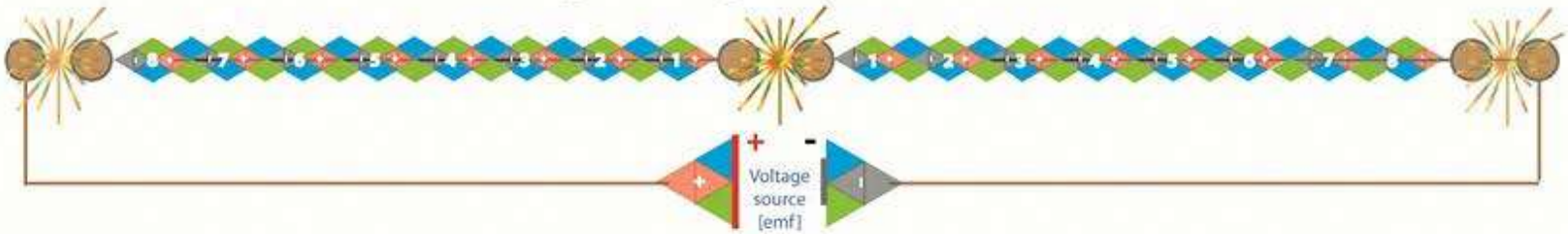
Producing Longitudinal EM waves

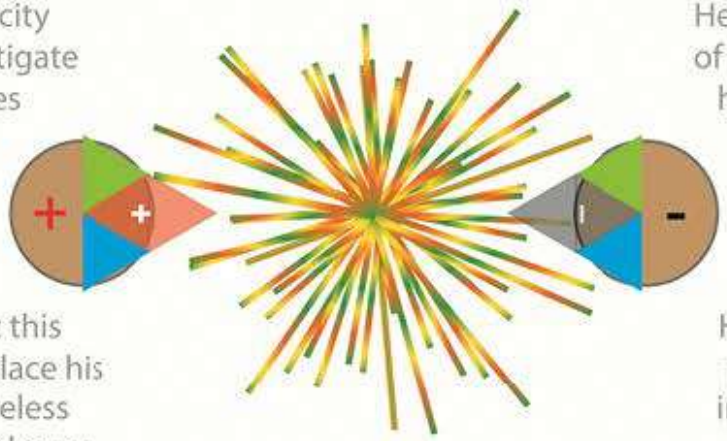


The short circuiting of voltage potentials or spark gap discharges of electrical energy are two ways to produce longitudinal EM waves

After inventing AC electricity Nikola Tesla began to investigate disruptive DC discharges

He noted the deadly power of the spark discharges and how they 'stung his face'

Orthagonal Magnetic fields produce reactive inductance fields



Longitudinal Electric fields produce lines of force

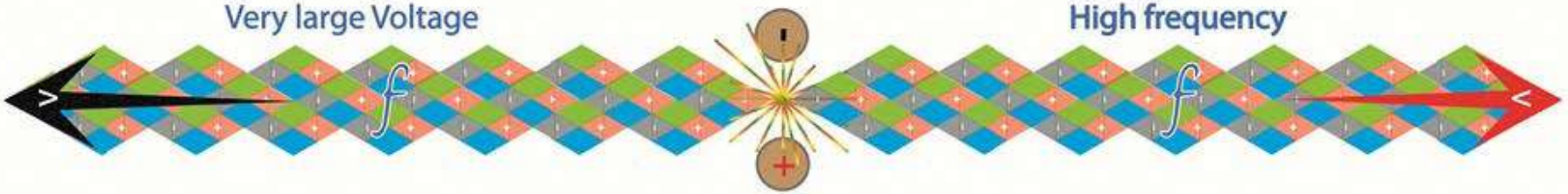
and he was convinced that this form of EM energy would replace his AC system and provide wireless energy to the World without losses

He strove to point out that the load circuits must be inductively coupled to the transmission circuits

or a combination of the two

Very large Voltage

High frequency



disruptive discharges

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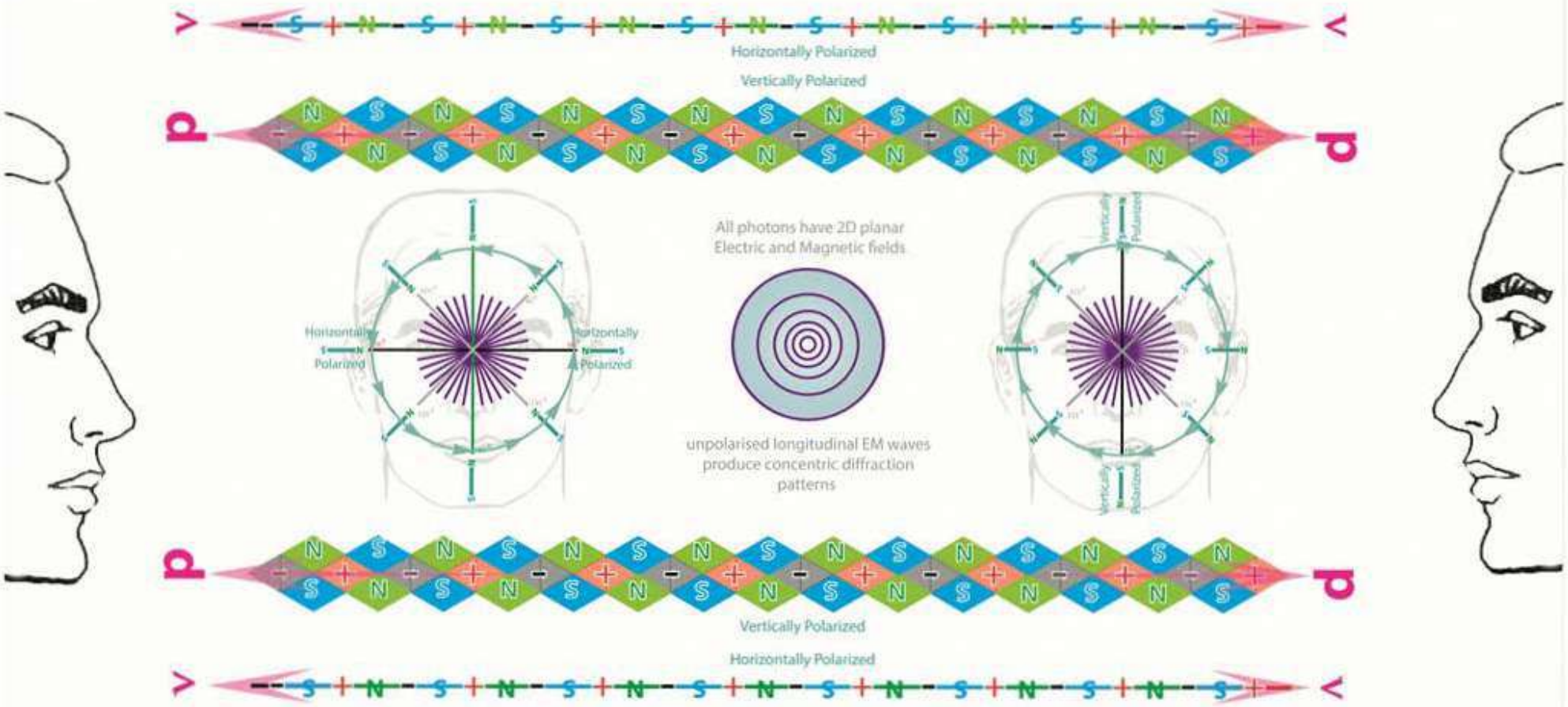
Longitudinal energy momenta

Maxwell's equations lead to the prediction of transverse electromagnetic waves as a means of transefering electrical power (where the wave's Electric fields and Magnetic fields vary perpendicularly to their direction of propagation).

Longitudinal Photons & EM waves are 2D electromagnetic waveforms with co-planar energy momenta that is co-linear with their directions of propagation and that can 'cut like a knife'

Longitudinal energy momenta waves [created by the use of spark gap technologies] are the EM energy forms created and radiated by Stars


Horizontally Polarized
Vertically Polarized
All photons have 2D planar Electric and Magnetic fields
unpolarised longitudinal EM waves produce concentric diffraction patterns
Vertically Polarized
Horizontally Polarized

The longitudinal alignment of E field momenta with their direction of propagation produces 'action-at-a-distance' and can produce material 'faster than light' velocities, if sufficient energies are inputted

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The velocity of Electrical energy momenta

c

Transverse EM waves propagate at energy at the speed of light

Γ

Longitudinal EM waves can propagate energies & information in excess of the speed of light

The velocity of light is the limit for electrical energy acceleration

(the induced velocity of charged particles resulting from electric field energy-momenta interactions)

470,912,891 m/s

463,491,072 km/second > < 288,000 miles/second

$v = [\pi/2]c$

Longitudinal electrical fields can create near-instantaneous 'action-at-a-distance' EM fields

once established, these fields can transfer momentum and information at speeds faster than light through co-linear impulses of momentum

Wheatsone achieved renown by a great experiment
The measurement of the velocity of electrical Energy in a wire.

He cut the wire at the middle, to form a gap which a spark might leap across, and connected its ends to the poles of a Leyden jar filled with electricity. Three sparks were thus produced, one at either end of the wire, and another at the middle. He mounted a tiny mirror on the works of a watch, so that it revolved at a high velocity, and observed the reflections of his three sparks in it.

The points of the wire were so arranged that if the sparks were instantaneous, their reflections would appear in one straight line; but the middle one was seen to lag behind the others, because it was an instant later. The electricity had taken a certain time to travel from the ends of the wire to the middle.

This time was found by measuring the amount of lag, and comparing it with the known velocity of the mirror. Having got the time, he had only to compare that with the length of half the wire, and he could find the velocity of electricity.

His results gave a calculated velocity of 288,000 miles per second, i.e. faster than what we now know to be the speed of light

Charles Wheatstone

(6 February 1802 – 19 October 1875)

Wheatstone measured the velocity of LONGITUDINAL electrical energy using spark gaps
[as opposed to transverse waveforms produced by oscillating voltages]

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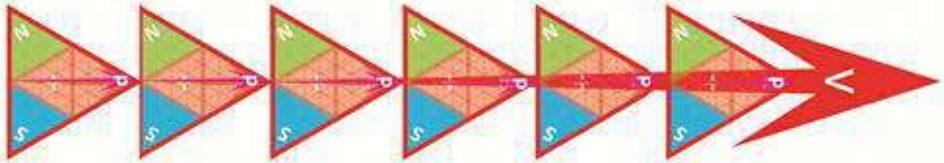
'Action at a Distance'

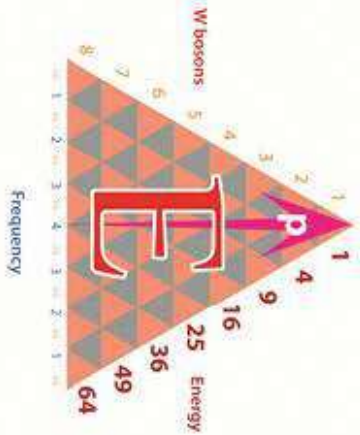
a source of mystery since it was first proposed by Newton as the basis for Gravitational attraction can be explained with Teslian Longitudinal waves

Positive longitudinal energy momenta

The ability of one source to affect the other depends on their respective potentials

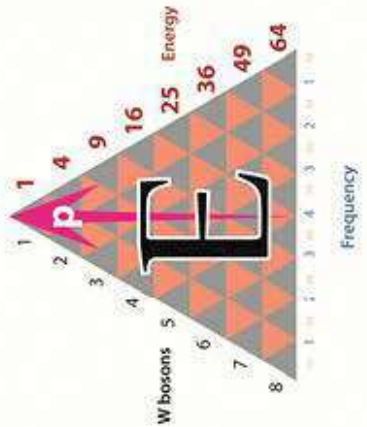


Increasing the Voltage of the discharges in the same time duration increases the total Momenta of the wave

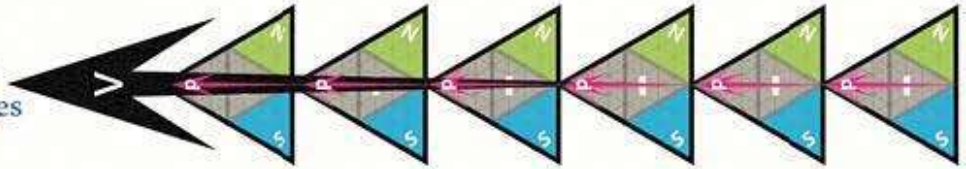


Bi-directional 'action at a distance'

'equal & opposite reactions'



Longitudinal waves are produced by DC discharges and are unidirectional



Once established bi-directional Longitudinal waves act as a 'instantaneous 'rigid conductor' of energy and information along their entire momenta length

Negative longitudal energy momenta

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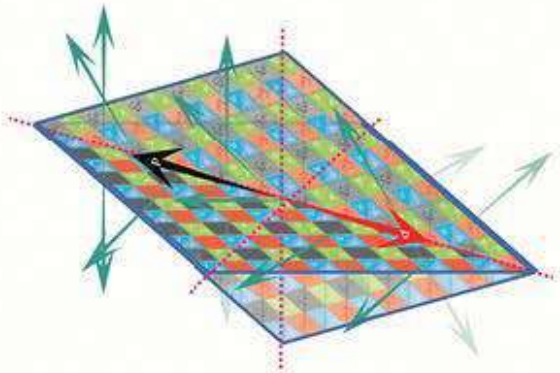
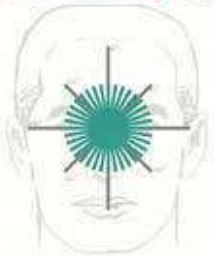
Longitudinal EM waves have their E-fields co-linear with their direction of propagation

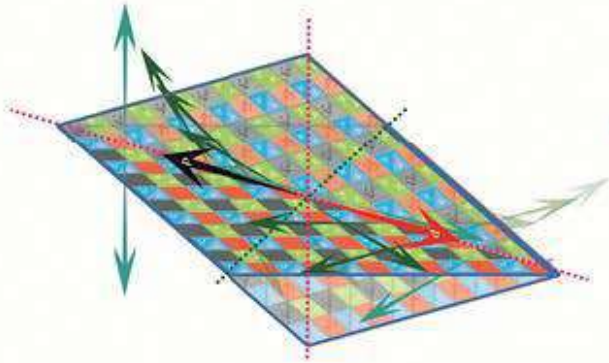


M field has NO preferential axial alignment (and can arrive at any angle)



Un-Polarised

Longitudinal Photons & EM waves are produced by disruptive spark gap discharges



M field has an alignment that follows a circular pattern (Clockwise or Counter-clockwise)

Circularly (or Elliptically) Polarised

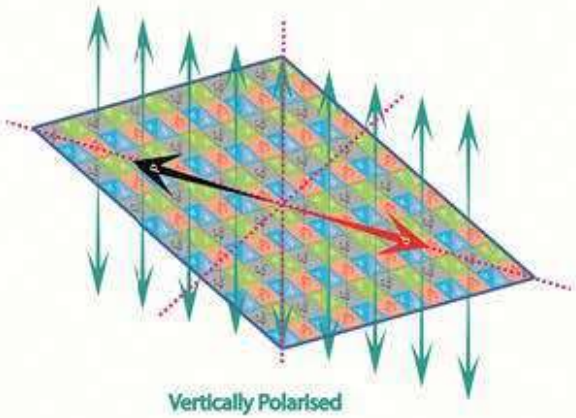
Longitudinal wave

polarisations

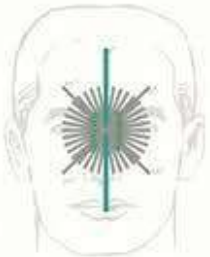
As a convention, the polarization of longitudinal EM waves must be described by specifying the orientation of the wave's magnetic field at a point in space over one period of the oscillation

Longitudinal waves have their linear momenta aligned along their direction of propagation and are extremely efficient at accelerating charges they interact with, creating co-linear accelerations [parallel to their direction of field propagation] - they do not produce charge oscillations along their vector direction of propagation like transverse waves.

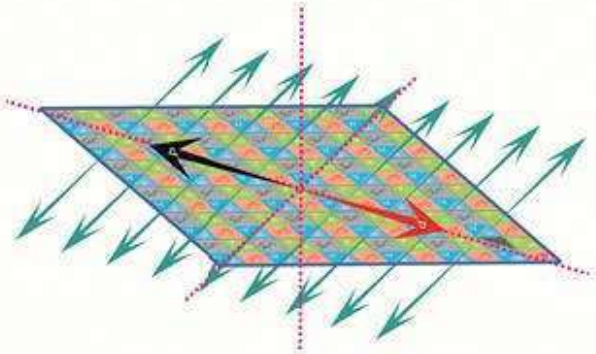
Examples of transverse waves include seismic P (primary) waves, and Tesla's longitudinal 'stinging' rays, whose electric fields and energy momenta are both co-linear with each other and parallel to the direction of energy transfer.



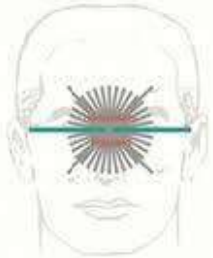
M field alignment is along the Vertical axis



Vertically Polarised



M field alignment is along the Horizontal axis



Horizontally Polarised

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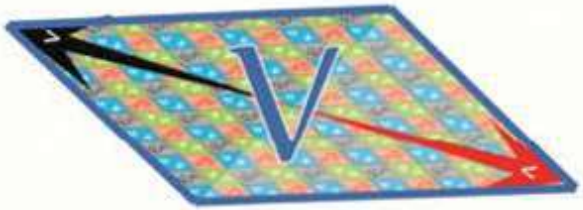
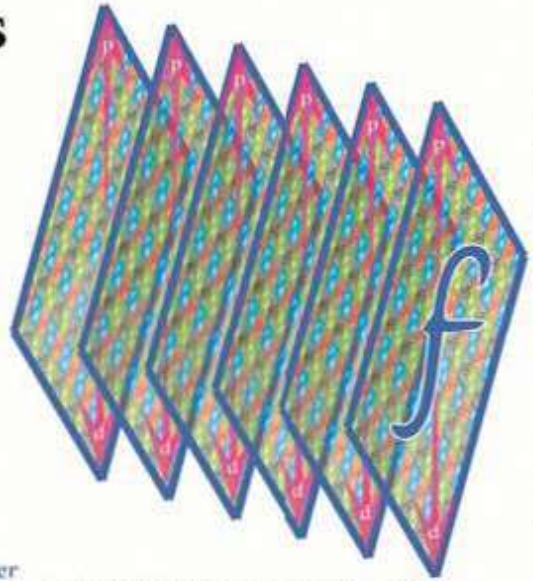
ElectroMagnetic waveforms

In Teslian longitudinal waves, produced by disruptive EM discharges, the E fields are co-linear with the direction of propagation



After inventing AC electricity Tesla investigated transferring energy through the air via electrostatic longitudinal waves to receiving devices. and noted the differing 'lethality' of the forces produced by these waves

Although comprised of the same energy momenta quanta
EM waves can be formed with Electric fields perpendicular to each other
thus leading to conflicting theories of EM wave propagation



Hertzian transverse waveforms have their EM fields perpendicular to the direction of propagation

In 1887, Heinrich Hertz demorstrated the reality of Maxwell's electromagnetic waves by experimentally generating radio waves in his laboratory

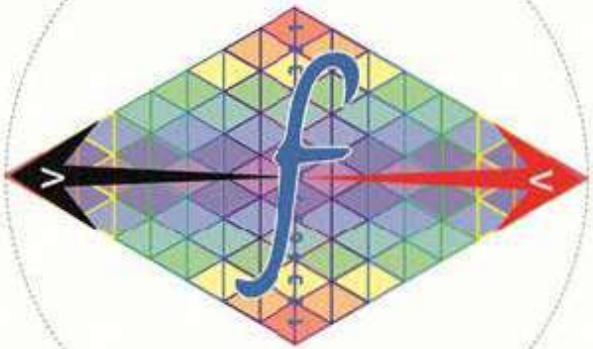
T

Teslian waves transmit Energy in a LONGITUDINAL waveform producing 'action-at-a-distance'

Nikola Tesla

(10 July 1856 – 7 January 1943)

W/m²



108 Mx = 1 J/A = 1 V·s = 1 Wb = 1 T·m2

c²
sec

Heinrich Hertz

(22 Feburary 1857 - January 1 1894)

Hz

Hertzian waves transmit Energy in a TRANSVERSE waveform producing 'radio waves'

Volt Seconds [per metre²]

Cycles per Second

Soon after Hertz's claim of discovering Maxwell's transverse EM waves Tesla visited him and personally demonstrated the experimental error to him.
Hertz agreed with Tesla and had planned to withdraw his claim, but varying agendas intervened and set the stage for a major rift in the 'accepted' theories

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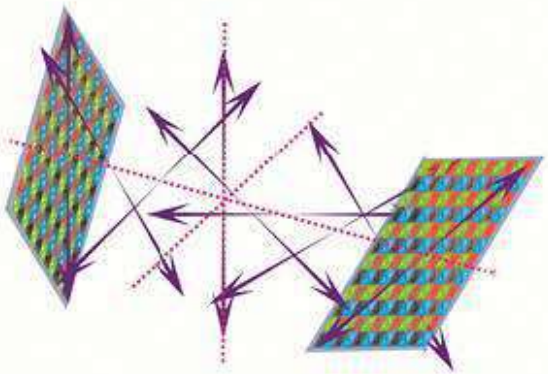
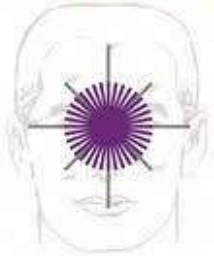
Transverse EM waves have their E&M fields orthagonal with their direction of propagation

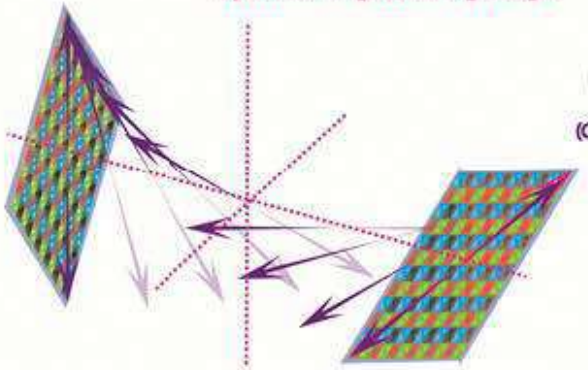


E field has NO preferential axial alignment (and can arrive at any angle)

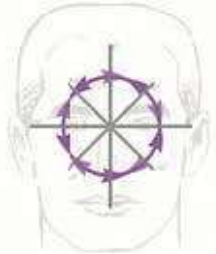


Un-Polarised

Transverse Photons & EM waves are produced by accelerating/oscillating charges



E field has an alignment that follows a circular pattern (Clockwise or Counter-clockwise)



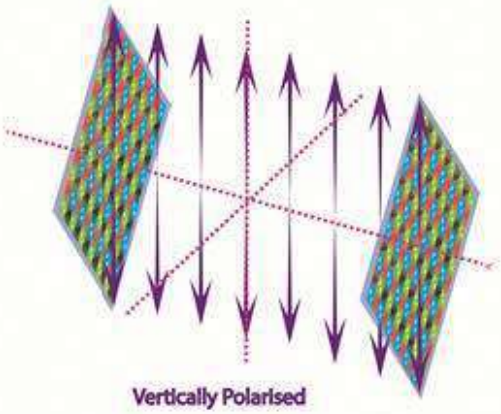
Circularly (or Elliptically) Polarised

Transverse wave polarisations

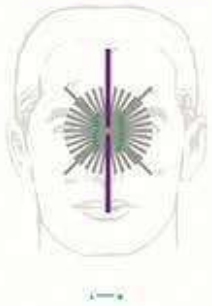
By convention, the polarization of EM waves is described by specifying the orientation of the wave's electric field at a point in space over one period of the oscillation

Transverse waves are inefficient propagators of EM energy as they apply their linear momenta tangentially to the charges they interact with, creating lateral accelerations [orthagonal to their direction of field propagation] - they do not accelerate charges along their vector direction of propagation like longitudinal waves.

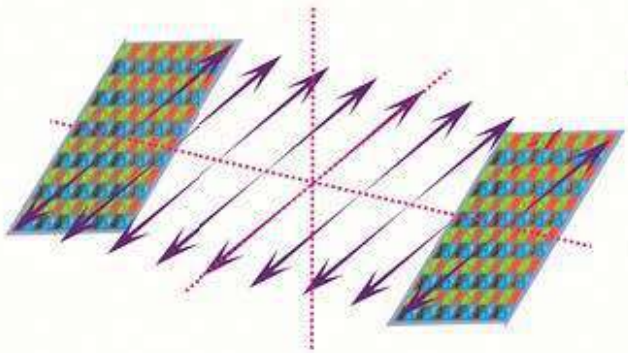
Examples of transverse waves include seismic S (secondary) waves, and electromagnetic plane wave, whose electric (E) and magnetic (M) fields both oscillate perpendicular to each other and orthogonal to the direction of energy transfer.



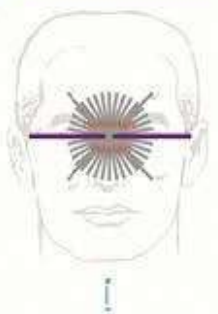
E field alignment is along the Vertical axis



Vertically Polarised



E field alignment is along the Horizontal axis



Horizontally Polarised

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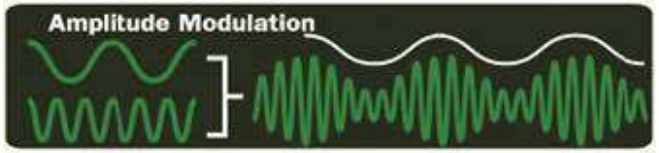
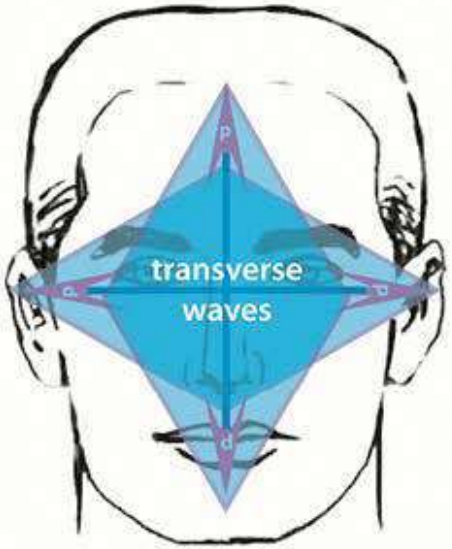
EM wave modulations

In telecommunications, modulation is the process of varying one or more properties of a periodic waveform, called the carrier signal, with a modulating signal which typically contains information to be transmitted

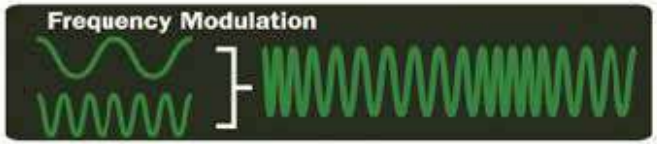
Amplitude modulation



the amplitude of the carrier signal is varied



the frequency of the carrier signal is varied



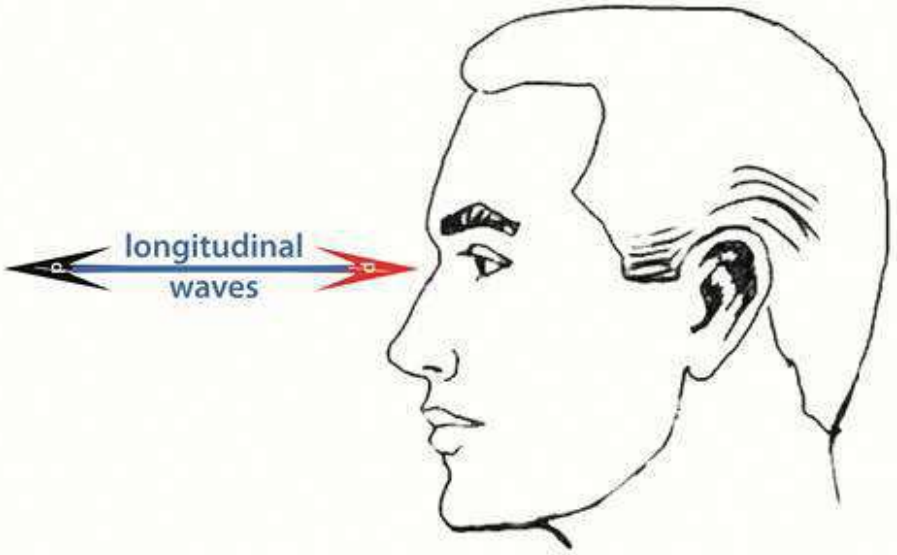
Frequency modulation

In addition to planar Hertzian waves
there exists Longitudinal EM waves

Impulse propagation

As the voltage [energy/coulomb] of longitudinal waves increases their co-linear energy-momenta increase and these forces provide a mechanical basis for near instantaneous 'action-at-a-distance'

Impulse propagation is distinct from pulse modulations



a narrowband analog signal is pulsed over an analog baseband channel

PCM Pulsed modulation TDM

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Transverse EM wave production

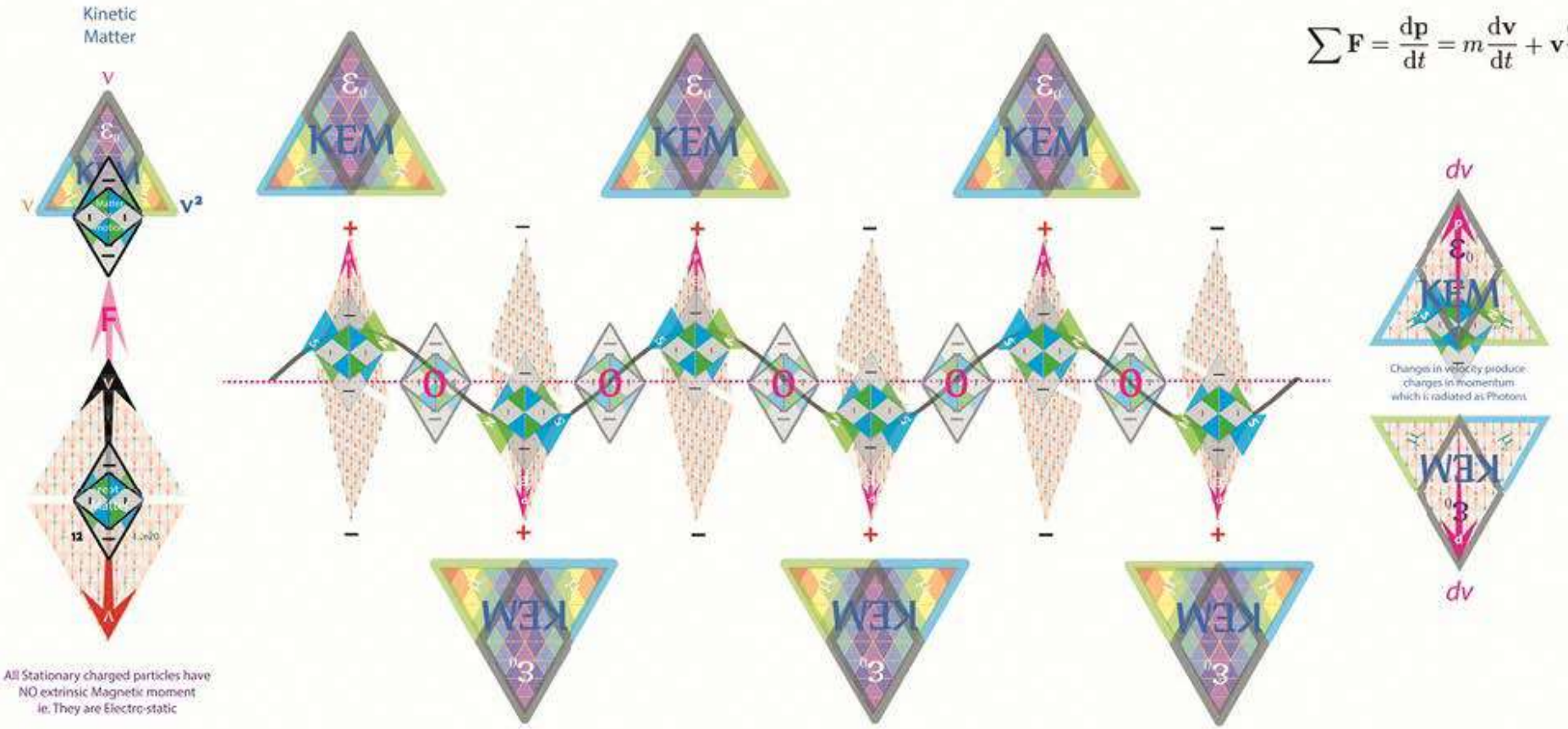
Alternating the Voltage potentials in an electrical circuit produces an Alternating Current
of electrons with Kinetic EM energies reflective of the Time-Energy duration of the AC circuit

Alternating Voltages provide an electromotive force to Electrically charged Particles producing tranverse Kinetic Energy fields with orthagonal Magnetic fields

Kinetic Energies from motion
(diverge from rest Matter)

F=ma

$$\sum \mathbf{F} = \frac{d\mathbf{p}}{dt} = m\frac{d\mathbf{v}}{dt} + \mathbf{v}\frac{dm}{dt}$$



Charges with constant velocities
produce
REACTIVE [K]EM FIELDS

Any change to the momentum of a charged particle in motion requires a corresponding quantum level energy-momentum change through the emission/absorption of quantised EM mass-ENERGY momenta in the form of W bosons

Accelerating Charges
produce
RADIANT EM WAVES

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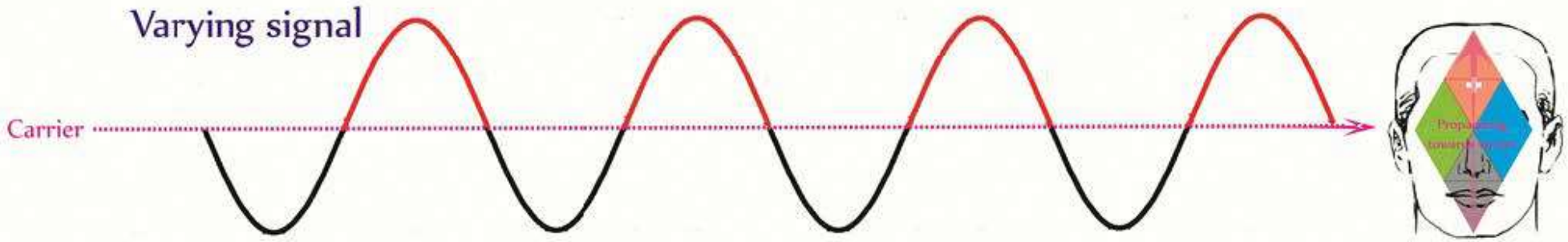
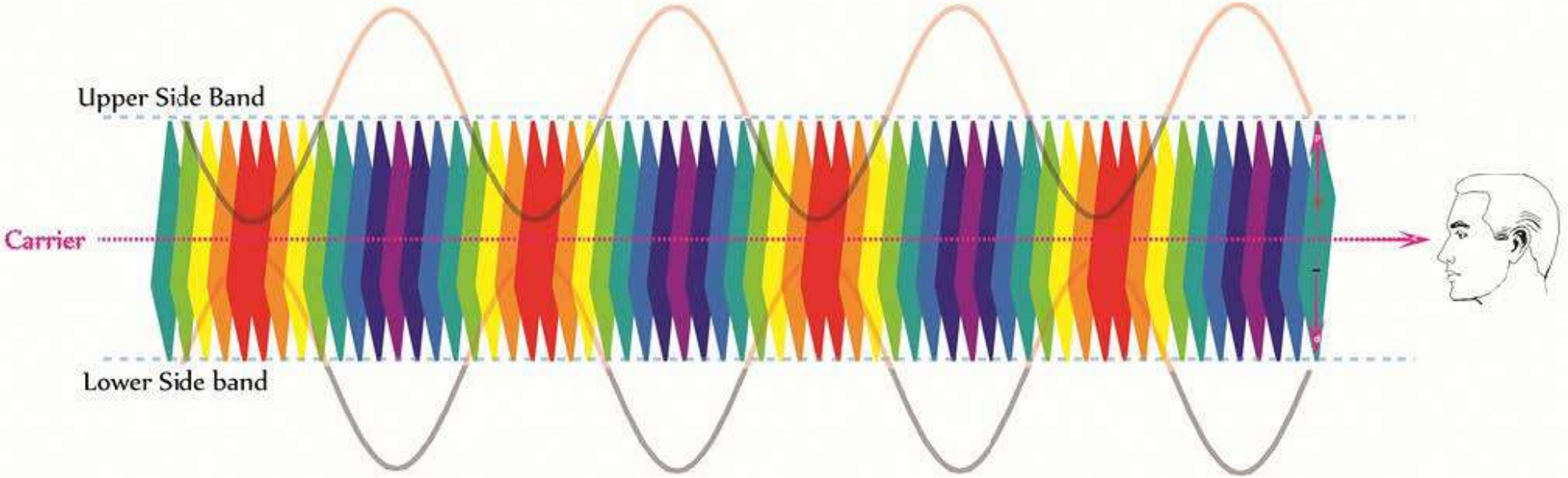
Modelling of planar transverse waves

(of varying amplitudes)



AM waveform

Amplitude Modulation (AM) works by varying the strength of the transmitted signal in relation to the information being sent.



Note: In amplitude modulation each colour planar wave contains differing energy momenta [n1-red to n8-violet]

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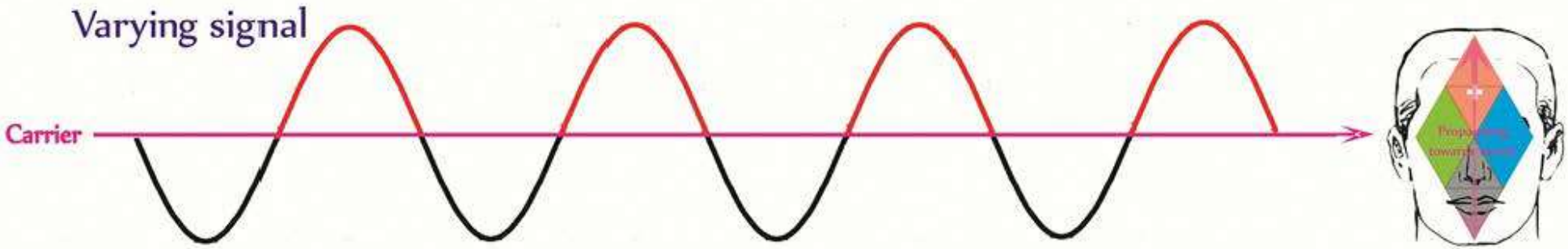
Modelling of planar transverse waves

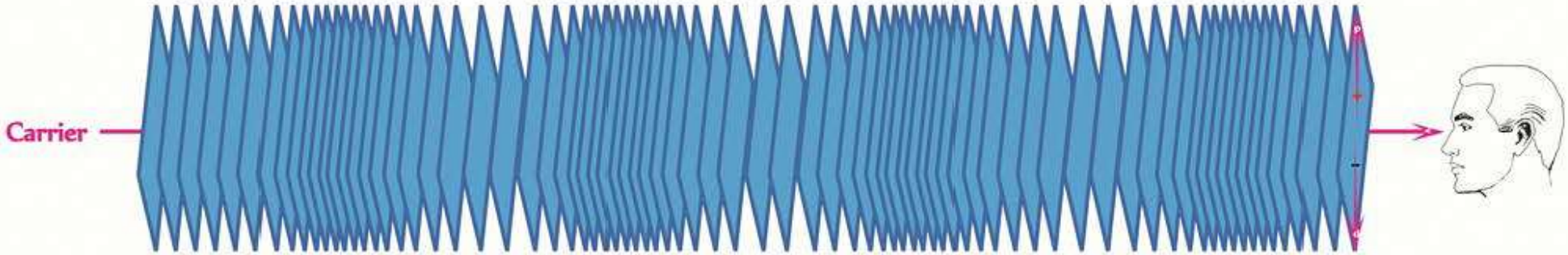
(of the same frequencies)



FM waveform

Frequency modulation (FM) is a form of modulation which conveys information over a carrier wave by varying its frequency (in contrast with amplitude modulation, in which the amplitude of the carrier is varied while its frequency remains constant).

In analog applications, the instantaneous frequency of the carrier is directly proportional to the instantaneous value of the input signal



Note: In Frequency modulation all the planar waves have the same energy momenta [only the number of waves per sec varies]

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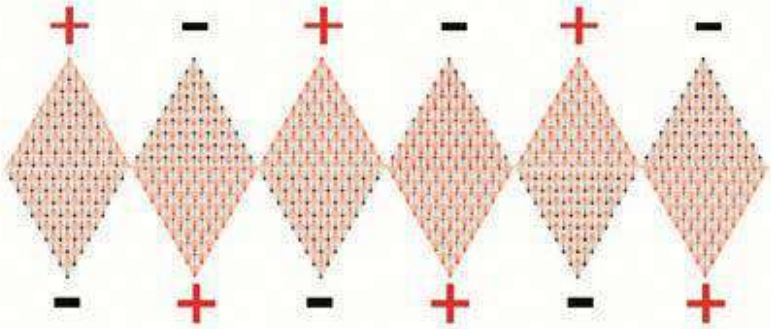
ElectroMagnetic waves

Mathematics alone [without a correct foundational geometry] is insufficent to describe EM radiation
EM waves can be Longitudinal or Transverse with respect to their direction of propagation

Tesla



Maxwell - Hertz

It is now clear [using Tetryonic geometry] that both Tela and Maxwell were correct in their opposing theories of EM waveforms
with Tesla proposing Longitudinal waves [from experiment] and Maxwell proposing Transverse waves [from his equations].

The differing opinions on the EM waveforms is shown to be a direct result of the sources of EM wave generation employed in their creation.
After the discovery of the photo-electric effect Hertz and others moved to oscillating charges to produce Transverse [planar] waves
while Tesla continued to investigate and utilise the older spark gap technology to produce Longitudinal waves

Spark Gaps & Plasma discharges produce longitudinal EM radiation

Accelerating charges produce transverse EM radiation

Transmitter

Action-at-a-Distance

Radio waves

Reciever

In order to explain and advance our understanding of all EM phenomena we must return to, and utilise, the older discharge technologies

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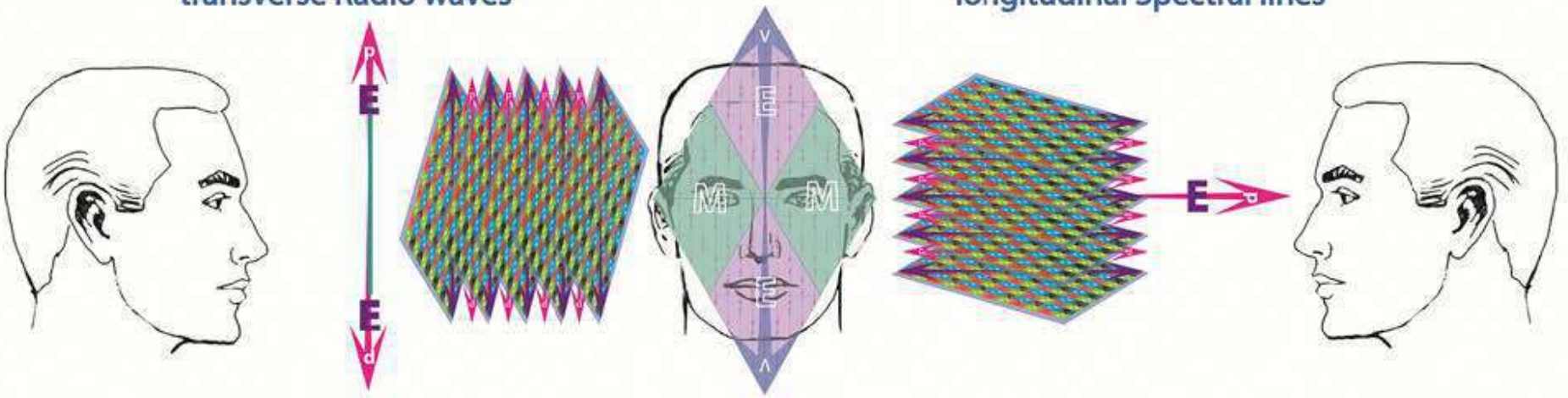
Planar electromagnetic waves

In the physics of wave propagation, a plane wave (also spelled planewave) is a wave whose wavefronts are infinite parallel planes of peak-to-peak amplitude normal to the phase velocity vector.

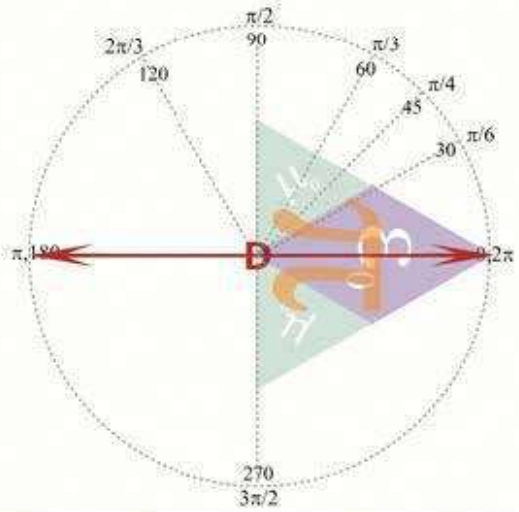
transverse Radio waves



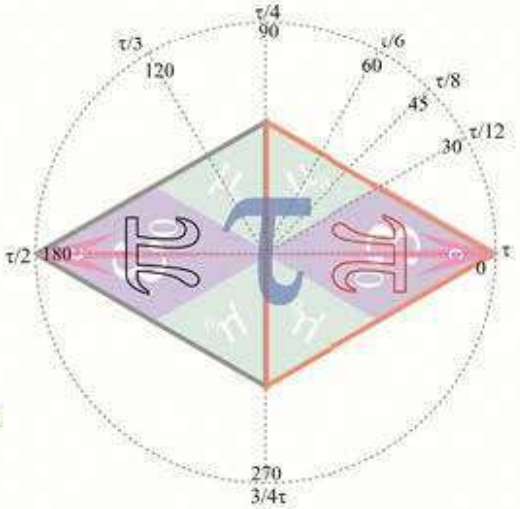
longitudinal Spectral lines

The phase relationships of their EM energy momenta can all be finally visualised and drawn through Tetryonic theory geometries

[with appropriate radian units]



bosons $2\pi[h\nu] = hf$ photons



τ is a more 'natural' radian unit for describing EM waves than π
tau = 2π = 360 degree rotation about a point

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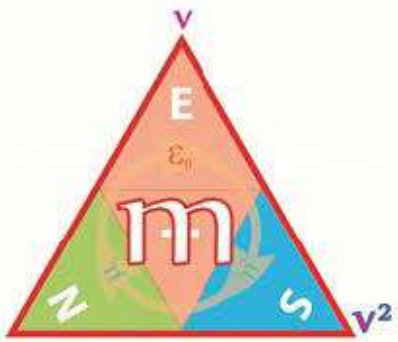
Lorentz co-ordinate transforms

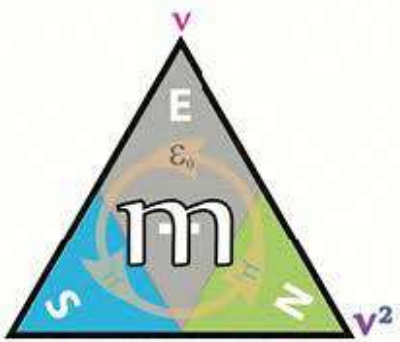
In physics, the Lorentz transformation (or transformations) are named after the Dutch physicist Hendrik Lorentz.

The transformations describe how measurements of mass-energies In space and time by two observers are related through mathematics

It was the result of attempts by Lorentz and others to explain how the speed of light was observed to be independent of the reference frame, and to understand the symmetries of the laws of electromagnetism.



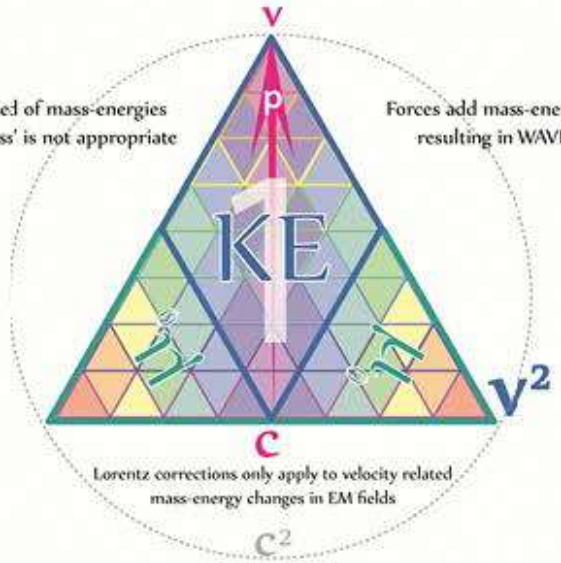
All photons are comprised of two dual-sided equilateral Planck quanta



All EM waves are comprised of neutral charge quanta called Photons

Photons are comprised of mass-energies and the term 'mass-less' is not appropriate

Forces add mass-energies to KEM fields resulting in WAVElength changes



Lorentz corrections only apply to velocity related mass-energy changes in EM fields

Linear correction factor

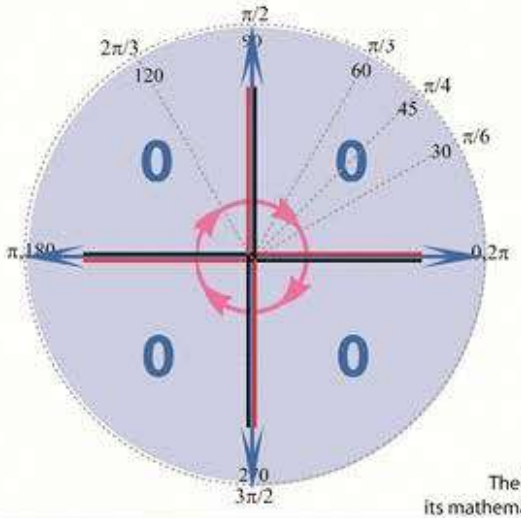
$$\beta = \left[\frac{v}{c}\right]$$

Linear Lorentz boosts produce changes to the velocity and momenta of a system

Scalar correction factor

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

As the velocity and momenta of a system changes so does its scalar energies



The Lorentz transformation is a linear transformation

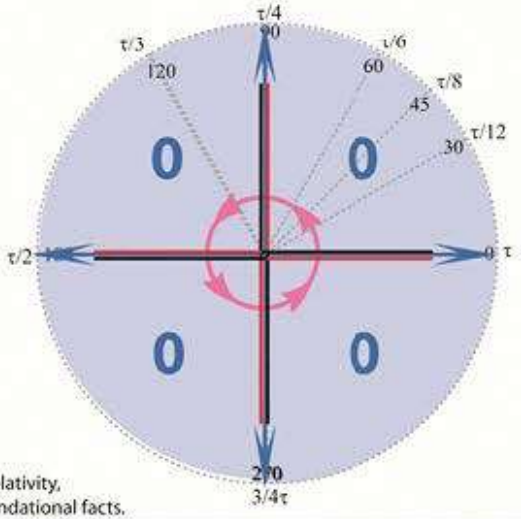
It may include a rotation of space;
a rotation-free Lorentz transformation is called a Lorentz boost.

bosons $2\pi[h\nu] = hf$ photons

π

As photons are neutral charge mass-energy geometries care must alway be taken in identifying and specifying the planar wavefront polarities and direction of wave propagation when developing co-ordinate systems to describe their motions and resulting electromagnetic properites

τ



The Lorentz transformation is in accordance with special relativity, but was derived well before special relativity, its mathematical development in relativity theory has resulted in erroneous assumptions being accepted as foundational facts.

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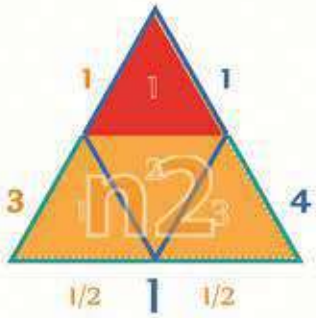
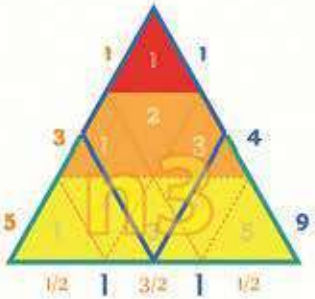
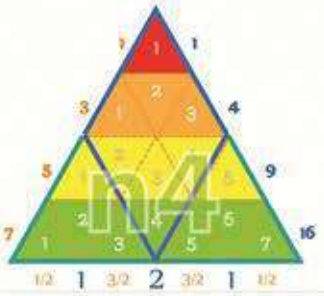
Photoelectron KEM fields

As electrons bound to nuclei are accelerated by external forces their energies of motion are stored in their KEM fields





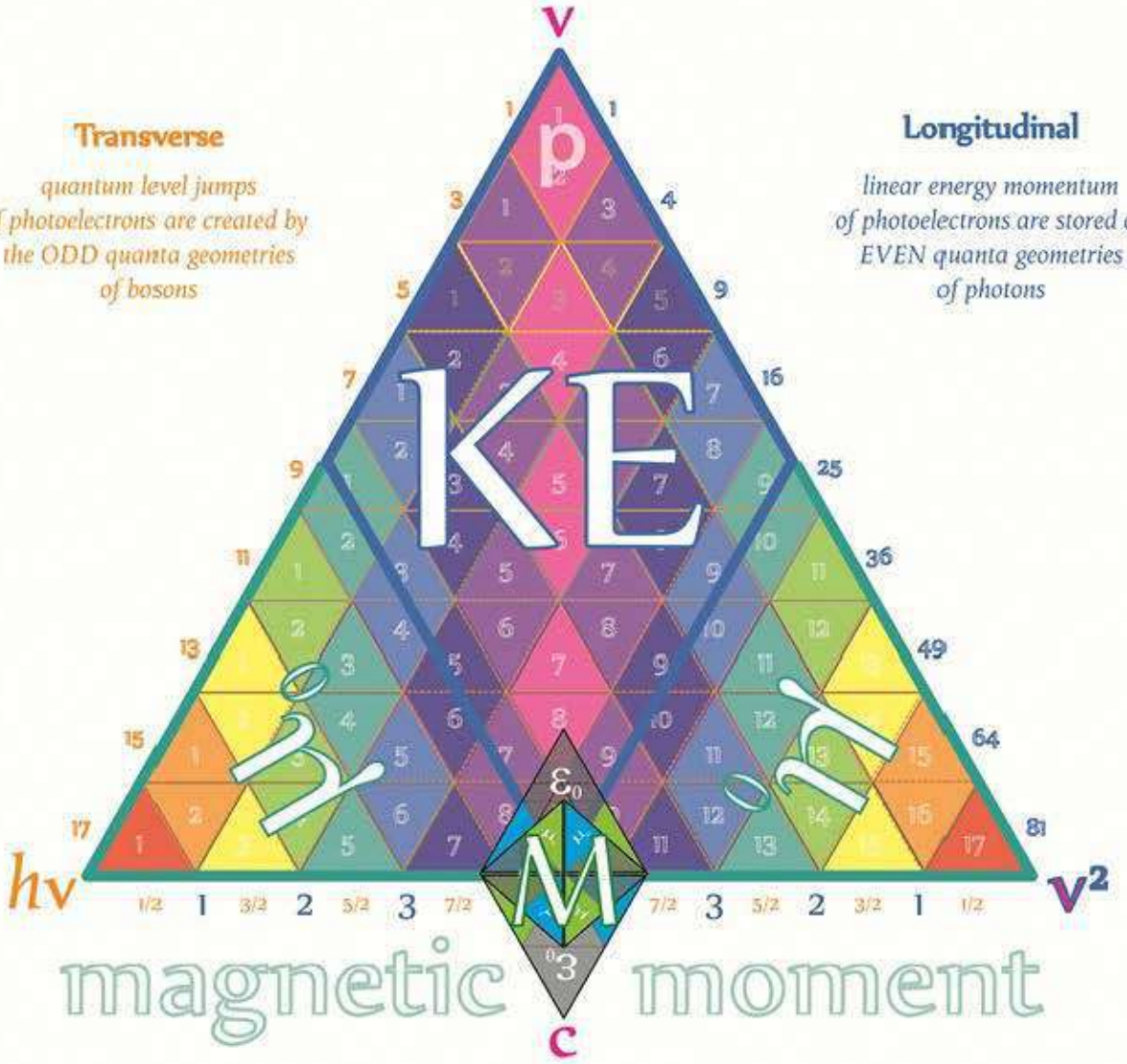


Transverse

quantum level jumps of photoelectrons are created by the ODD quanta geometries of bosons

Longitudinal

linear energy momentum of photoelectrons are stored as EVEN quanta geometries of photons



KEM mass-energies are subject to velocity related Lorentz corrections and produce magnetic moments

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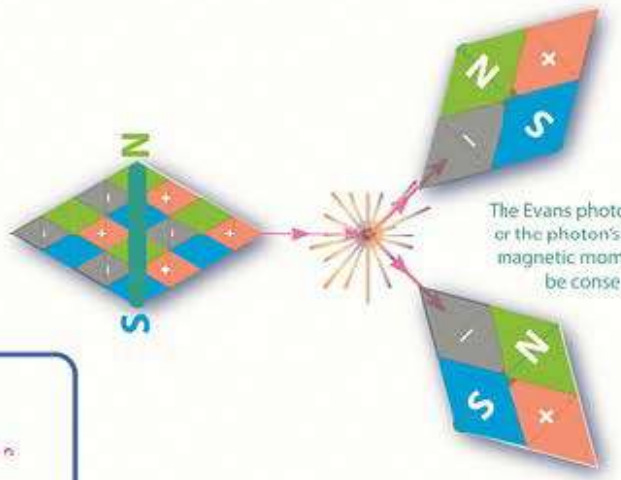
Kinetics & Photons

The photon has several properties that distinguish it from all other subatomic particles.

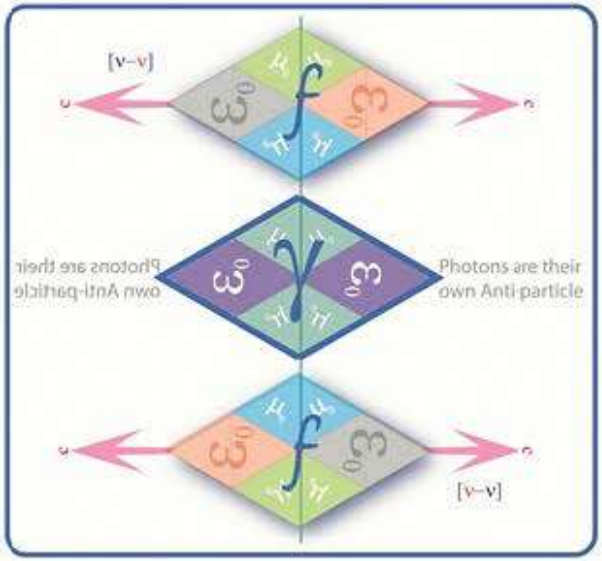
It is the only elementary particle wherein a high-energy photon can transform/split into two or more low-energy photons.

A photon is a magnetic dipole. It is an elementary magnet. Evans discovery of the photon's longitudinal magnetic field in 1992 is considered as significant as Einstein's discovery of Relativity.



The Evans photomagneton or the photon's transverse magnetic moment has to be conserved.

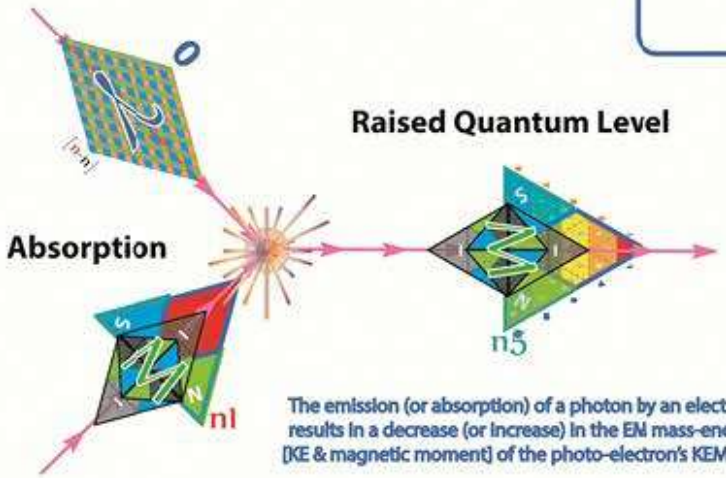
Photons can form super-position EM waves



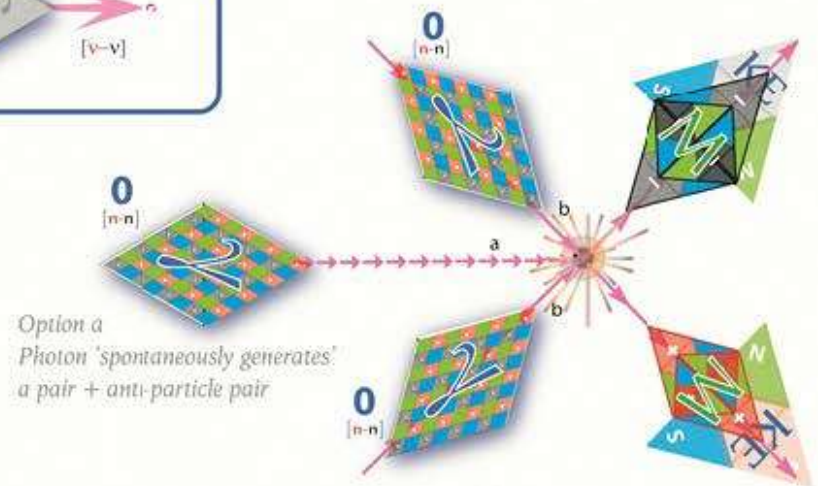
PAIR PRODUCTION
A photon with sufficient energy can be transformed into a real electron-positron pair.

The EM mass-energy is conserved as per Einstein's equivalence of mass and energy.

The photon's magnetic charge is conserved in the magnetic moments of the created electron-positron pair.



The emission (or absorption) of a photon by an electron, results in a decrease (or increase) in the EM mass-energy [KE & magnetic moment] of the photo-electron's KEM field



Option a
Photon 'spontaneously generates' a pair + anti-particle pair

Option b
Two Photons combine

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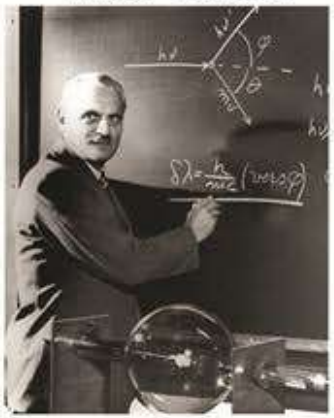
Arthur Compton



(September 10, 1892 - March 15, 1962)

Compton Scattering

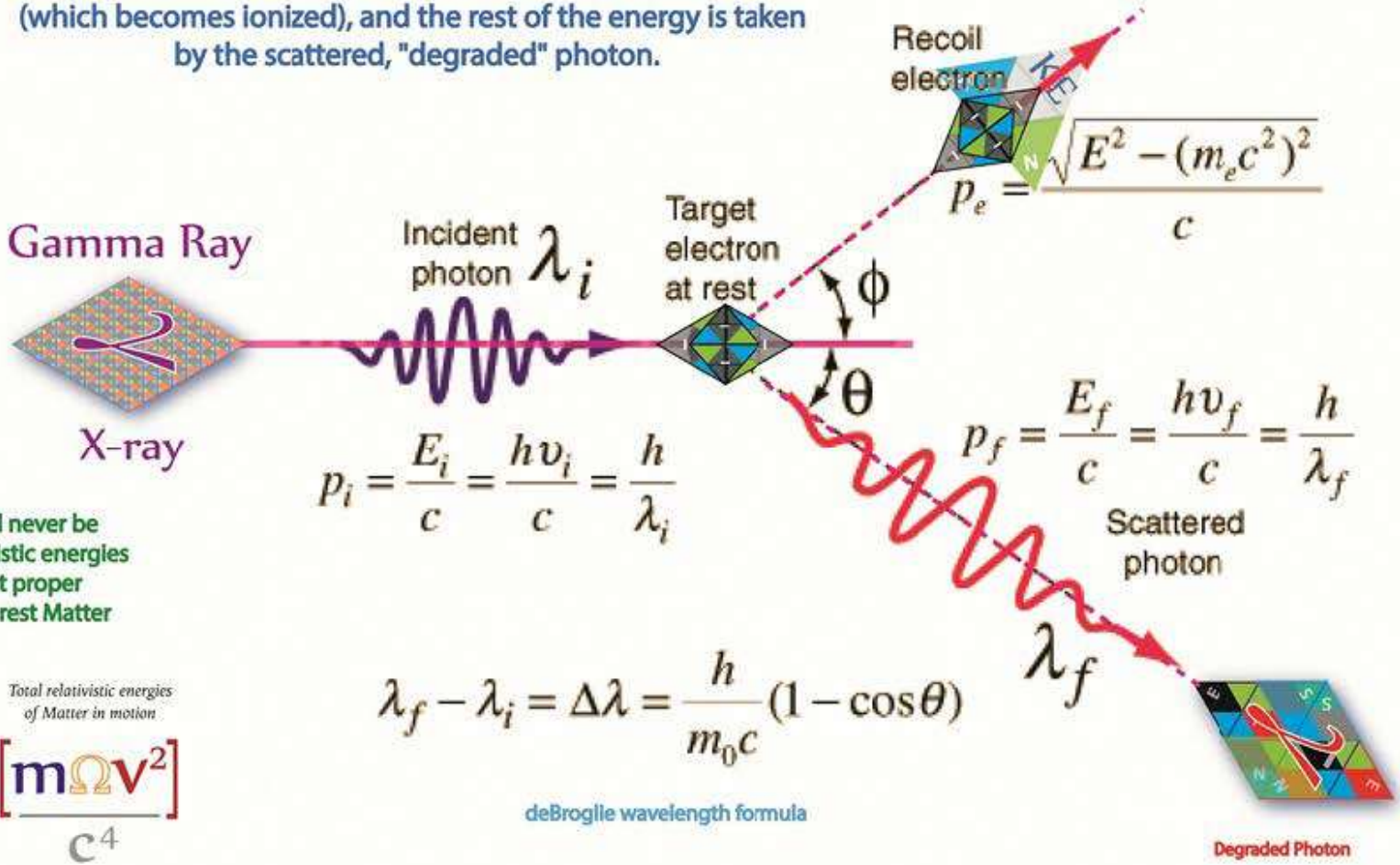
The in-elastic scattering of photons in matter results in a decrease in energy (increase in wavelength) of an X-ray or gamma ray photon and is called the Compton effect.

Part of the energy of the X/gamma ray is transferred to a scattering electron, which recoils and is ejected from its atom (which becomes ionized), and the rest of the energy is taken by the scattered, "degraded" photon.

Compton frequency of photons

$$E = hf = \frac{hc}{\lambda} = mc^2$$

where v = c



Lorentz corrected energies of EM masses in motion

$$n\pi\left[\frac{m\Omega v^2}{c^2}\right]$$

Compton frequencies should never be calculated from the total relativistic energies of Matter in motion without proper consideration of the invariant rest Matter

Total relativistic energies of Matter in motion

$$n\pi\left[\frac{m\Omega v^2}{c^4}\right]$$

$$\lambda_f - \lambda_i = \Delta\lambda = \frac{h}{m_0 c}(1 - \cos\theta)$$

deBroglie wavelength formula

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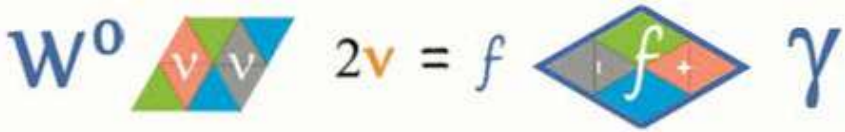
Pair Production

$$mv^2 = E = \tfrac{1}{2}hf$$

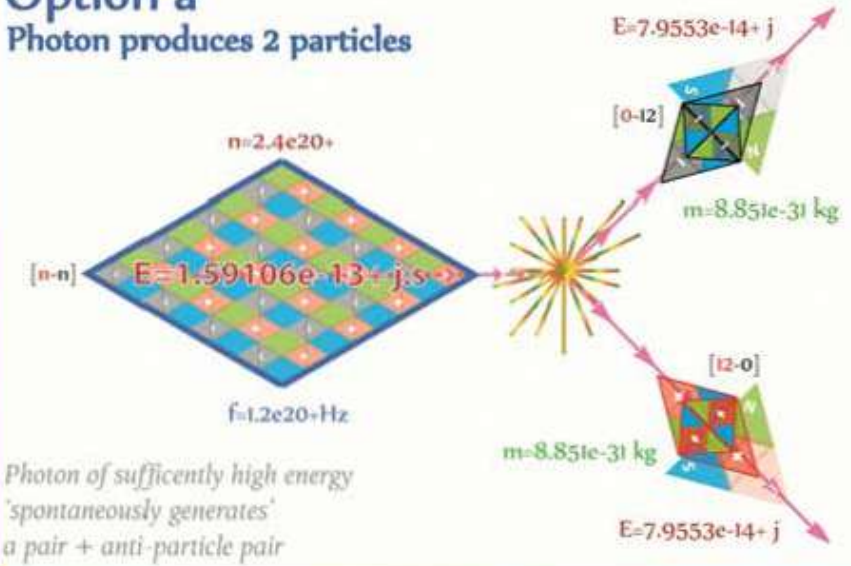
A photon with sufficient energy can be transformed into a real, material electron-positron pair.

The EM mass-energies of the system are conserved as per the equivalence of mass and Energy.

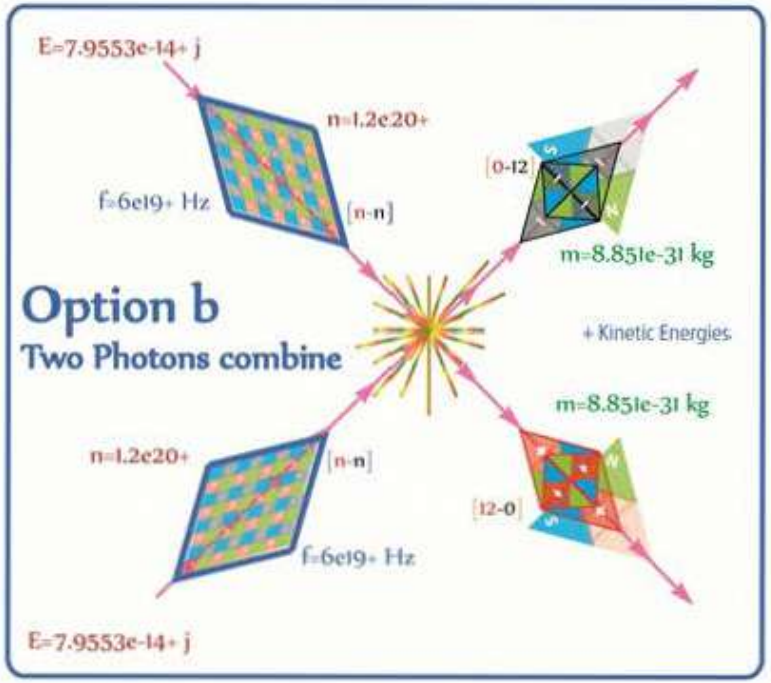


The photon's magnetic dipole and charges are also conserved (but in differing charge geometries)

Option a
Photon produces 2 particles



Photon of sufficently high energy 'spontaneously generates' a pair + anti-particle pair



Planck's constant	Energy	electron rest mass-Matter
6.62432672 e-34 kgm^2/s	7.9553 e-14 j	8.8514860 e-31 kg

$$n\pi\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v^2}\right]_{\text{Planck quanta}} = E = T\pi\left[\underset{\text{mass}}{m}\Omega\underset{\text{velocity}}{v^2}\right]_{\text{Planck quanta}}$$

6 e19	1.2 e20
photon frequency	Compton frequency

All pair production - annihilations must follow the mass-Energy-Matter equivalency formula

mass c^2 ← *per second* — E — *per second squared* → c^4 Matter

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Kinetic Energies

$$KE = \frac{1}{2}Mv^2$$

As velocity increases so does the number of energy momenta quanta per spatial geometry

Photons contain Kinetic energies and momentum

Photonic Energy

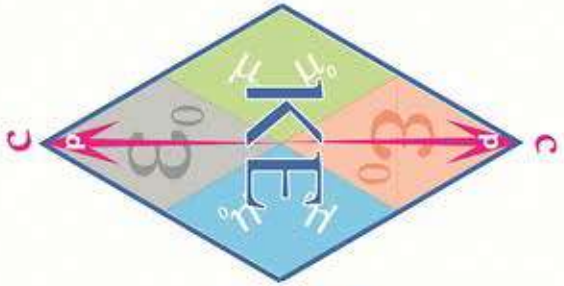
$$E_\gamma = 2\pi\left[\left[m\Omega v^2\right]\right]$$

Planck quanta; mass; velocity

Kinetic Energy and momenta are all related through Tetryonic geometry

Photons

$$p = \frac{h}{\lambda} = \frac{E}{c}$$



$$E = hf$$

Momentum

$$\frac{P^2}{2m} = KE = \frac{1}{2}Mv^2$$

As the number of Photons increases so does the Momentum

$$p = \frac{n\pi\left[\left[m\Omega v^2\right]\right]}{v} = E/v$$

Planck quanta; mass; velocity

All Photons travel at the 'speed of light' in their medium of transmission

$$p = \frac{E}{c} = \frac{h\nu}{c} = \frac{h}{\lambda}$$

$$p = n\pi\left[\left[m\Omega v\right]\right]$$

Planck quanta; mass; velocity

linear energy-momentum

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Electronic Kinetic Energies

have discrete energy levels within the nucleus and
continuous energy levels in unbound electrons

Boson exchanges between quantum levels provides the basis for all electron - photon interactions

$0.211\ eV / n^2$

Relativistic KEM formula must always remove invariant rest Matter PRIOR to Lorentz correction being applied

$$KEM = RE - mc^2$$

As rest Matter is invariant and the Lorentz factor applies to EM waves only

$$KEM = 4\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

Electric & Magnetic energies are contained in the KEM field geometry extending from all Matter topologies in motion

n8 13.525 eV
n7 3.381 eV — Un-named
n6 1.502 eV — Humphreys
n5 0.845 eV — Pfund
n4 0.541eV — Brackett
n3 0.375 eV — Paschen
n2 0.276 eV — Balmer
n1 0.211 eV — Lyman
n0 — Rest Matter

$$p/h = \tilde{\nu}$$

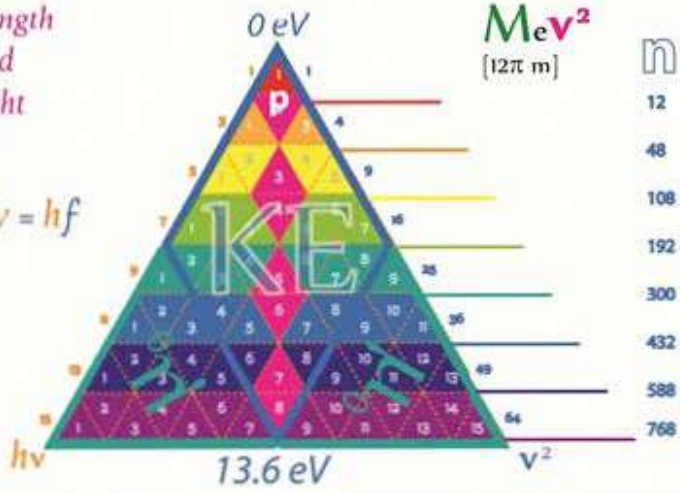
Wave numbers are the inverse of Wavelengths

$$h/p = \lambda$$

Frequency and Wavelength are inversely related via the Speed of Light

$$m\Omega v^2/h = f$$

$$2m\Omega v = hf$$



$$Mv^2 = KEM = hv^2$$

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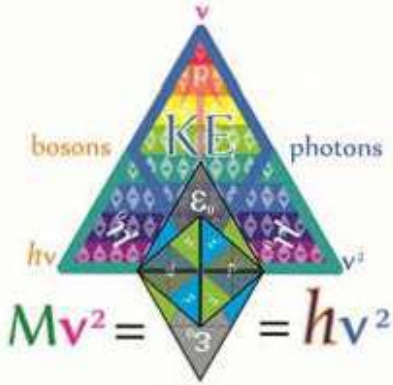
Photonic energy momenta of KEM fields



$$Mv^2 = = hv^2$$

Rydberg's formula is a wavenumber equivalent re-expression of Lorentz's velocity correction formula as it applies to the quantised energy momentum of Photo-electrons bound in atomic nuclei

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

The difference of two inverse squared KEM energies

Rydberg

$$R\left(\frac{1}{1} - \frac{1}{4}\right)_{.75}$$

Tetryonic

$$= R\left(36/48\right)_{.75}$$

n1 and n2 are integers greater than or equal to 1 such that n1< n2

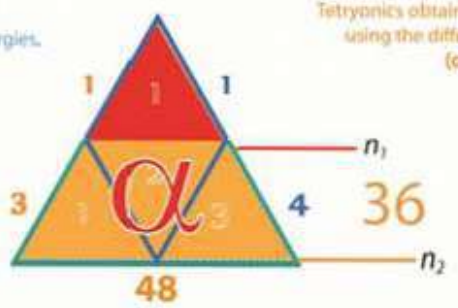
$$\frac{1}{2}Mv^2 = KE = hcR$$

Whereas Rydberg calculated for wavenumbers using the difference of two inverse squared KEM energies. (inverse wavelengths)

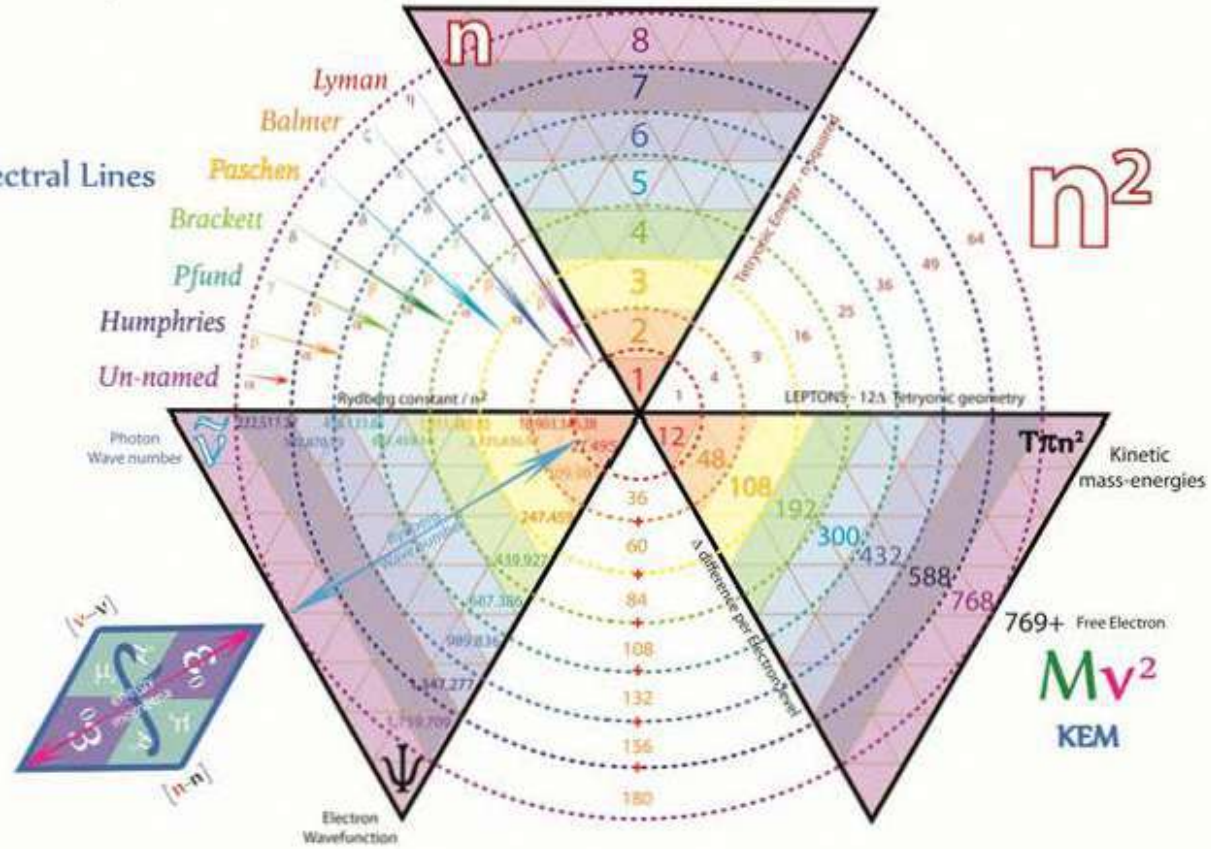
$$\left(\frac{1}{1} - \frac{1}{4}\right)_{.75}$$

A mathematical solution that works but whose physical mechanics has eluded explanation

Tetryonics obtains the same answers geometrically using the difference of the two KEM energies. (quanta differentials)



(36/48) .75



Any changes to the Energy momenta of the electron's KEM field must be reflected in the Energy momenta of the Photo-electrons emitted [absorbed]

$$\pm\Delta hv = KEM_i - KEM_f$$

The difference of two KEM energies

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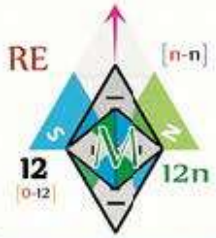
Kinetic Energies of Photoelectrons

rest Matter

Kinetic energies are DIVERGENT from Matter topologies



Relativistic mass-energies

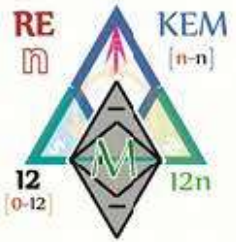
rest Matter + Kinetic Energies

The total energy of a photon is absorbed into the electron's KEM field geometry

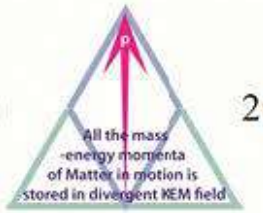
All velocity changes produce changes to mass-energies, momenta and wavefunction relationships

$$KEM = Mv^2$$

rest Matter is velocity invariant



$1e19\,v = n$



$2v = f$

6.62943 e -34 J.s

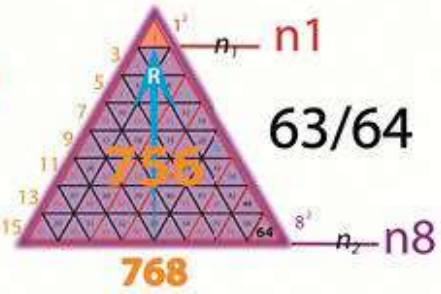
13.5252 eV
2.1669 e -18 J

$$E = hv^2$$

3.26874 e15 quanta

KEM fields are velocity variant

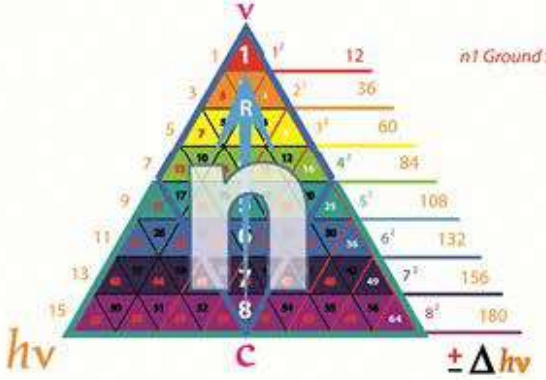
Δp



$$4\pi \underset{\text{KEM field}}{} \left[\underbrace{[\varepsilon_0 \mu_0]}_{\text{ElectroMagnetic}} . \underbrace{[m \Omega v^2]}_{\text{mass velocity}} \right]$$

EM Field — Planck quanta

Electron KEM Quantum levels



Rydberg spectral transition jumps

$$R_H\left(\frac{1}{1} - \frac{1}{64}\right) = \frac{1}{\lambda} = KEM\left(\frac{63/64}{1}\right)$$

Rydberg .984375 — Tetryonic .984375

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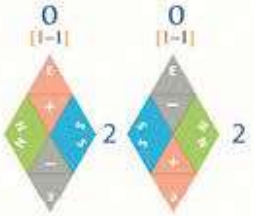
Spectral line energies

$1\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (Charge; EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

ZPF

ZPF

Each quantum level transition requires kinetic energies with an ODD number of EM mass-energy momenta quanta [bosons - charge carriers]



γ $2\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (Photons; EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

$n.hv$

Bosons are

Odd number Charge carriers

In order to transistion between levels for each emission and absorption leptons must release or absorb specific W bosons (neutral Z bosons - photons) for each KEM field change

Photons are

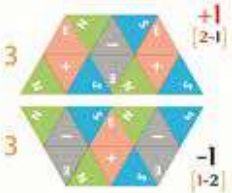
Even number EM force carriers

$n.hf$

$ODD\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (Bosons; EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

W+

W-



Pairs of charged W bosons combine to form neutral bosons / photons [EM induction]

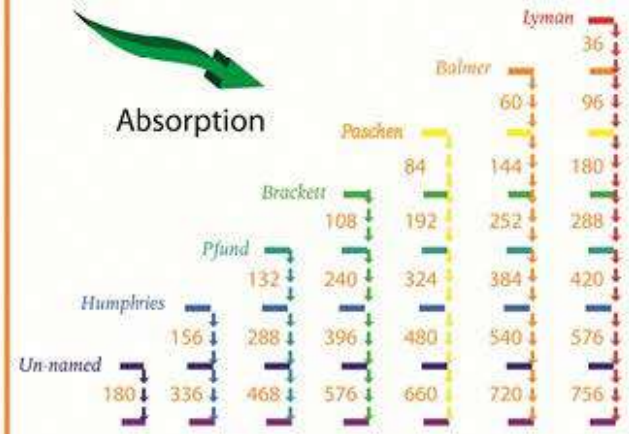
W^0 $EVEN\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$ (EM waves; EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

KEM field Differentials

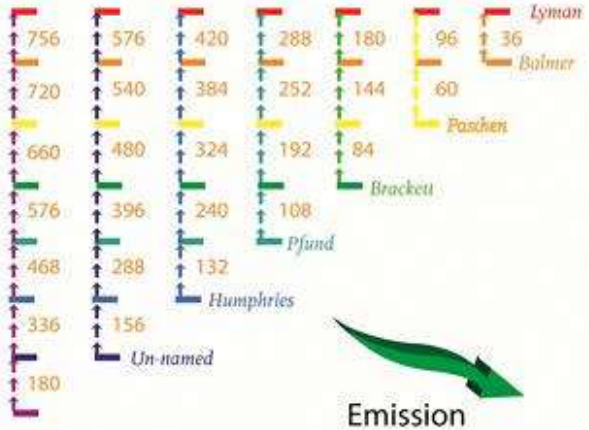
Bosonic quantum level changes

Mv^2

Absorption



Mv^2



Emission

All quantum level changes are the result of boson increases or decreases

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Quantum level differentials

The exact number of Kinetic energy quanta (ZPFs) required for each bound electron transition within a nucleus

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

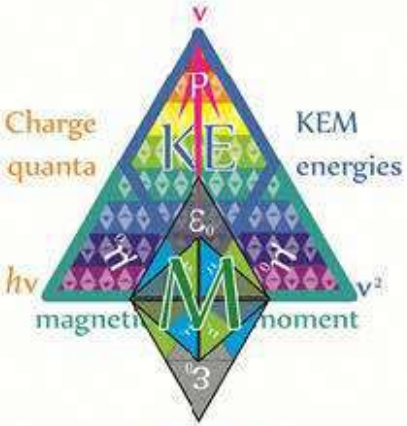
Ryberg calculated this as the wavenumber differerential of two inverse squared energies

Rydberg

$$n_f^2 \qquad R_H\left(\frac{1}{1} - \frac{1}{4}\right)_{.75} = R_H\left(36/48\right)_{.75} \qquad n_i^2$$

Tetryonic

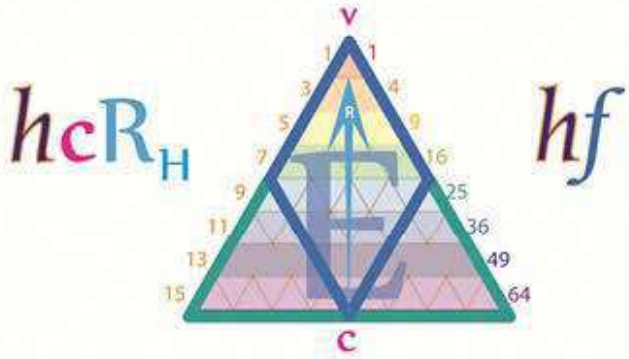
Tetryonic geometry reveals it to be sum of ODD integer bosons between two squared KEM energies



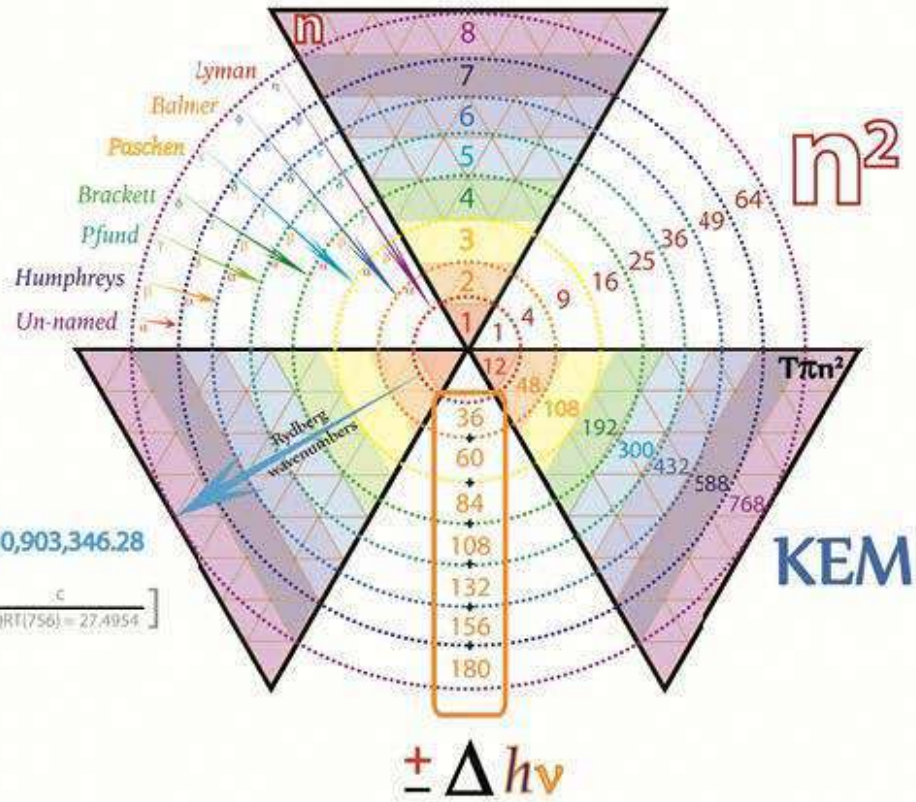
Each Quantum level jump within an Atomic Nuclei is discrete and requires an exact number of EM mass-energy quanta

The calculation of the quanta required is historically done utilising Rydberg's Constant and its associated formula

The quantum level [boson] differential equates it to the release or absorption of consecutive ODD number Planck quanta from squared KEM field energy geometries Δ[hv]



Rydberg's constant is a LINEAR measurement of wavenumbers which can be related to squared KEM energies through the velocity-frequency-wavelength relationship



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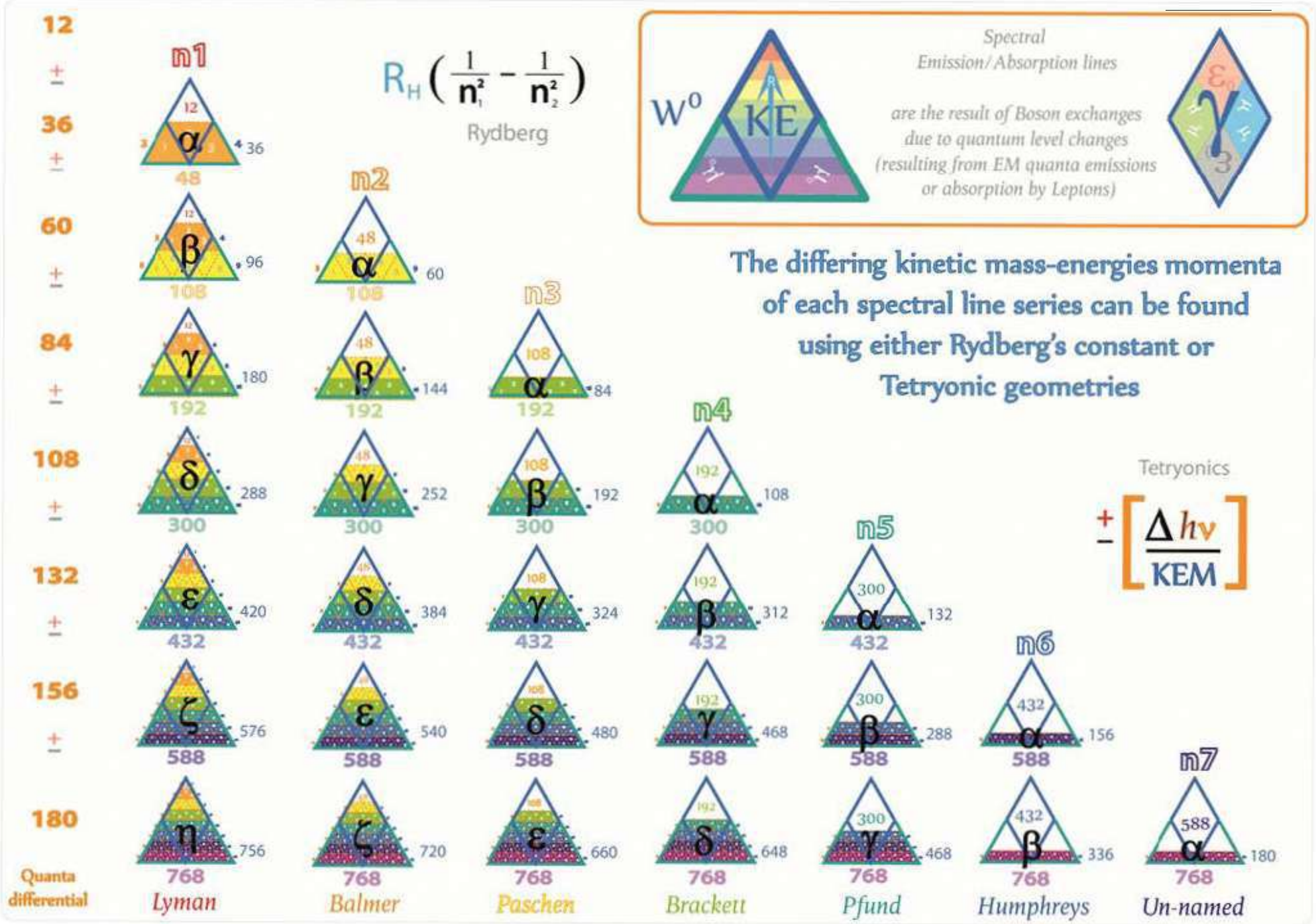

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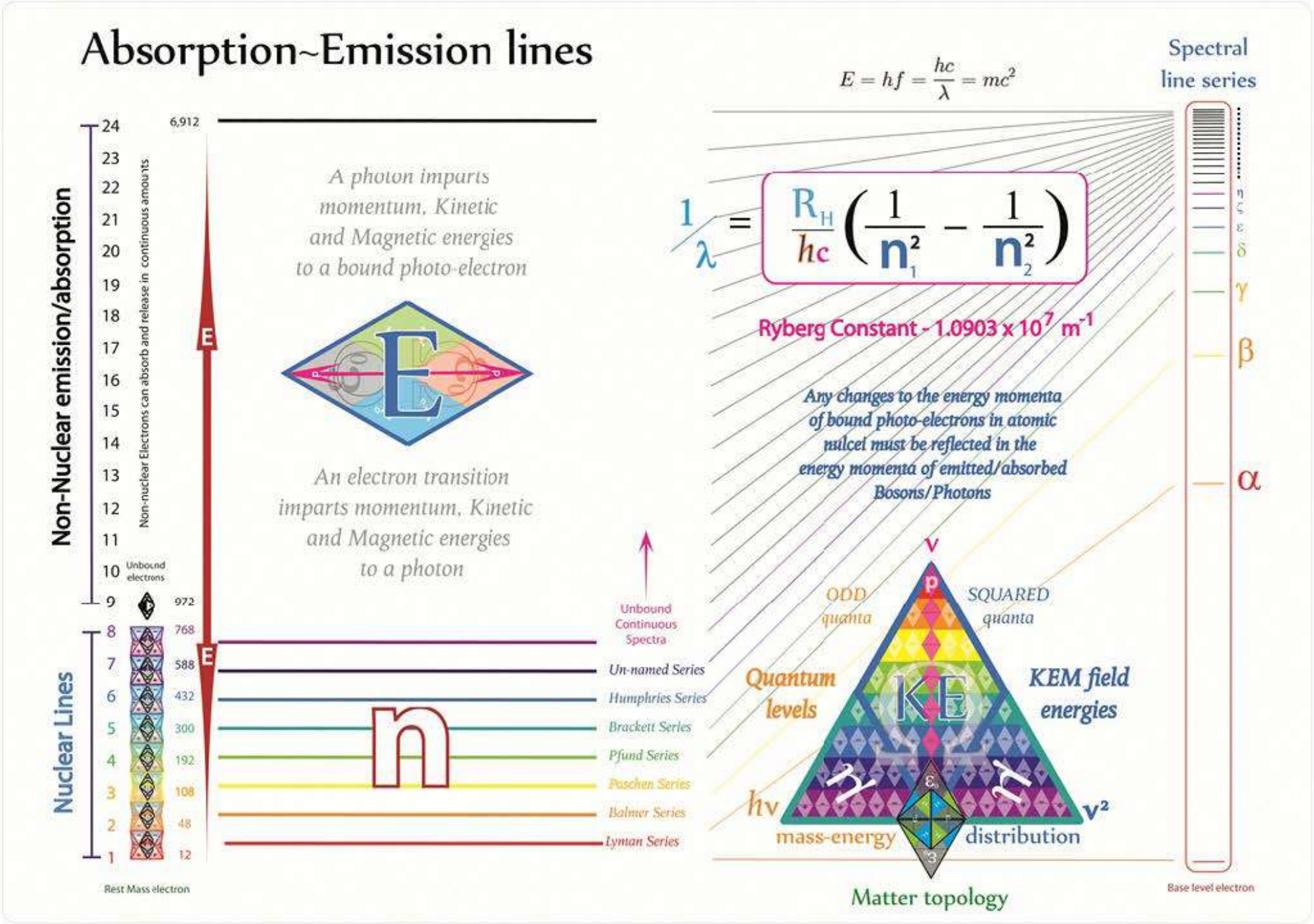

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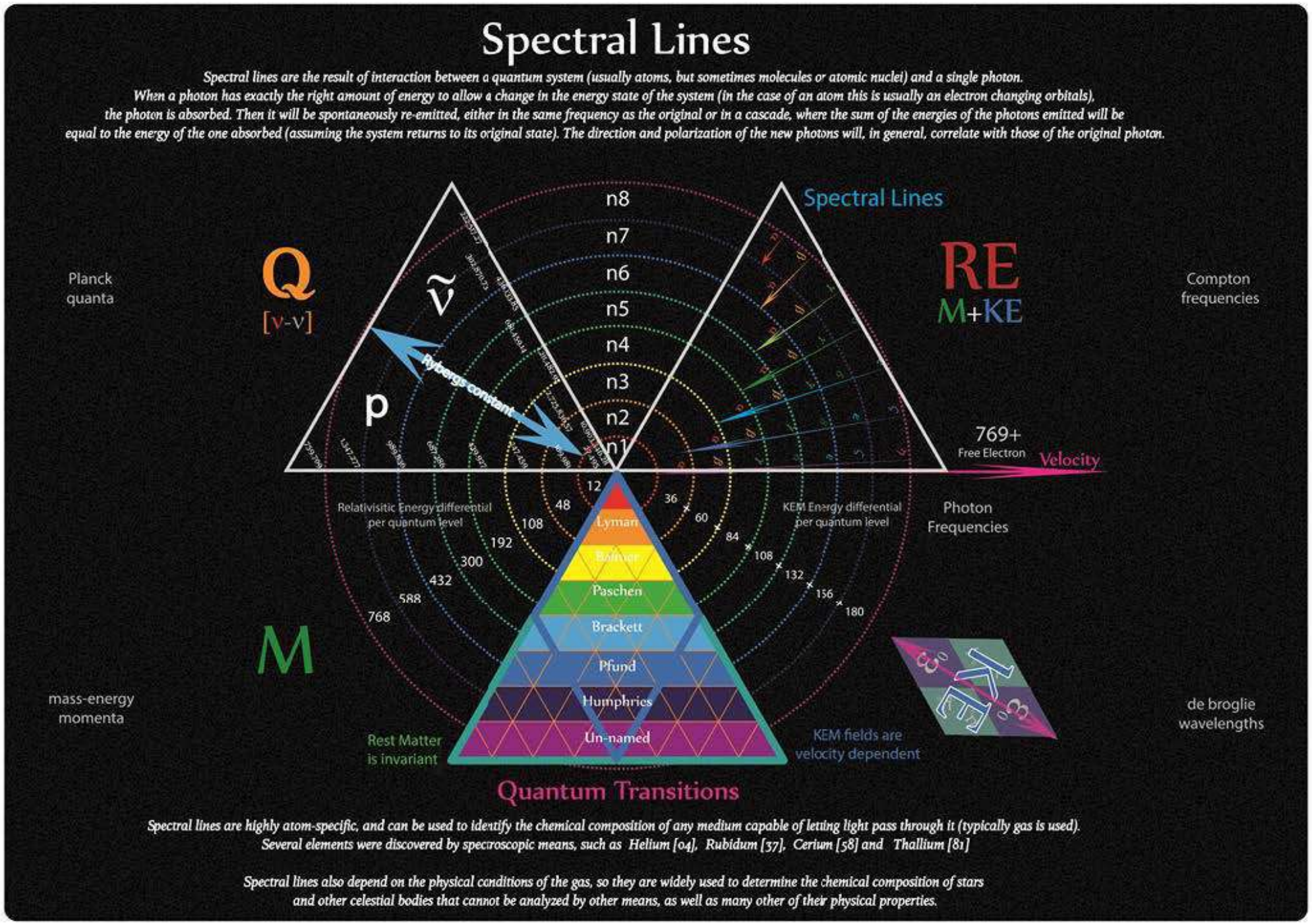
Spectral Lines

Spectral lines are the result of interaction between a quantum system (usually atoms, but sometimes molecules or atomic nuclei) and a single photon.
When a photon has exactly the right amount of energy to allow a change in the energy state of the system (in the case of an atom this is usually an electron changing orbitals),
the photon is absorbed. Then it will be spontaneously re-emitted, either in the same frequency as the original or in a cascade, where the sum of the energies of the photons emitted will be
equal to the energy of the one absorbed (assuming the system returns to its original state). The direction and polarization of the new photons will, in general, correlate with those of the original photon.



Spectral lines are highly atom-specific, and can be used to identify the chemical composition of any medium capable of letting light pass through it (typically gas is used).
Several elements were discovered by spectroscopic means, such as Helium [04], Rubidum [37], Cerium [58] and Thallium [81]

Spectral lines also depend on the physical conditions of the gas, so they are widely used to determine the chemical composition of stars
and other celestial bodies that cannot be analyzed by other means, as well as many other of their physical properties.

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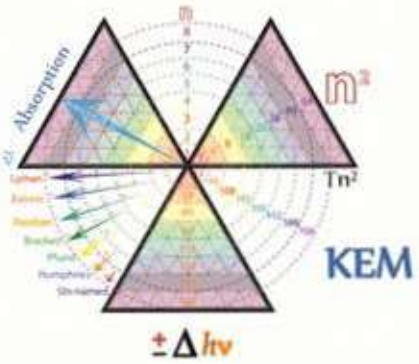
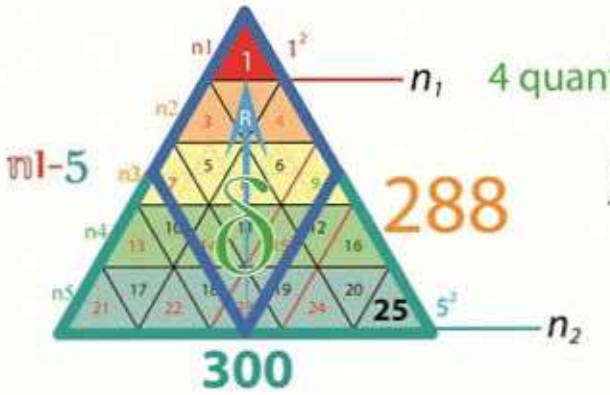
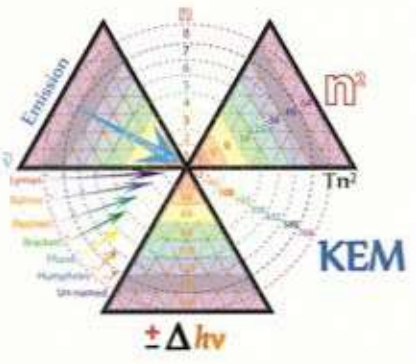




$$\frac{1}{\lambda} = R\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

.96 KEM

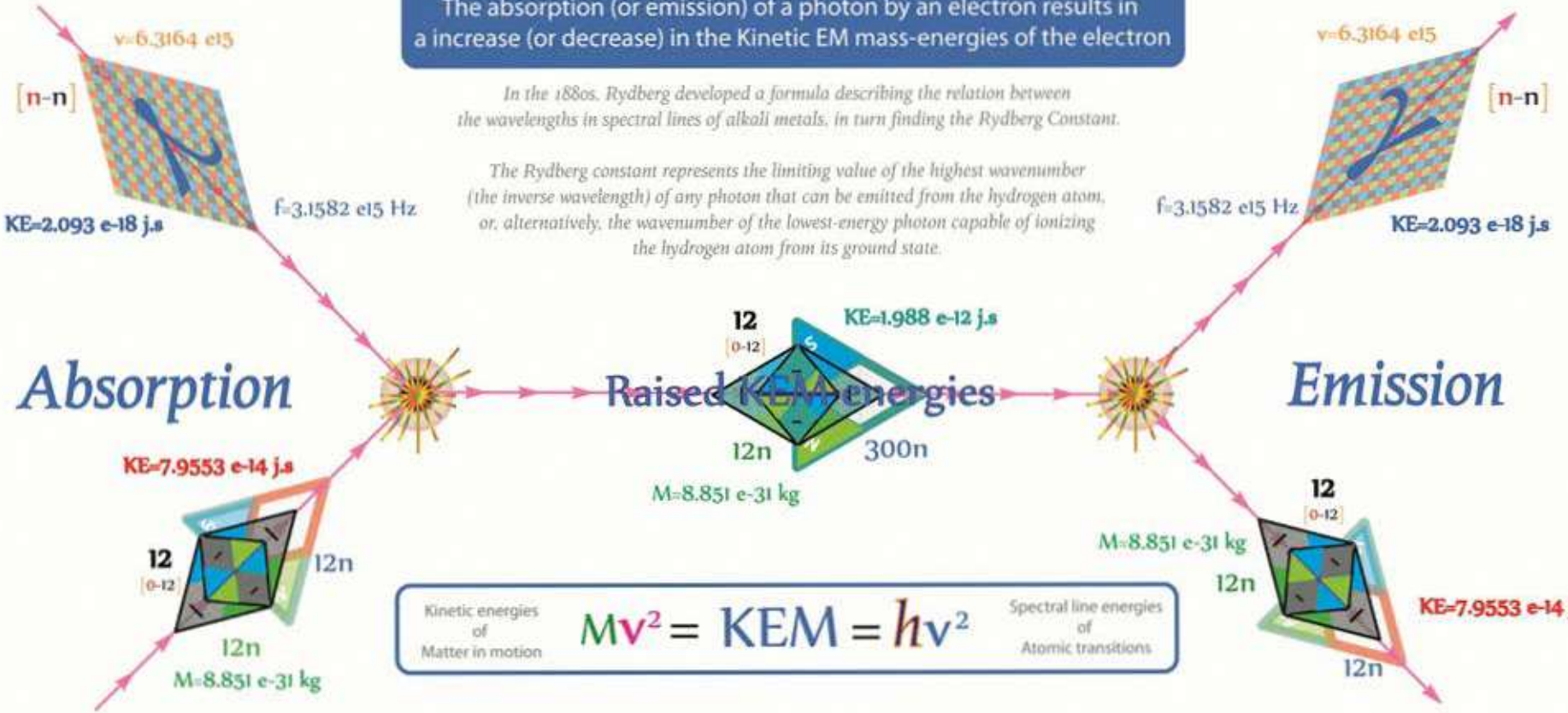


Photoelectron KEM field changes

The absorption (or emission) of a photon by an electron results in a increase (or decrease) in the Kinetic EM mass-energies of the electron

In the 1880s, Rydberg developed a formula describing the relation between the wavelengths in spectral lines of alkali metals, in turn finding the Rydberg Constant.

The Rydberg constant represents the limiting value of the highest wavenumber (the inverse wavelength) of any photon that can be emitted from the hydrogen atom, or, alternatively, the wavenumber of the lowest-energy photon capable of ionizing the hydrogen atom from its ground state.



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Revealing Rydberg Formula's geometry

The Rydberg formula is used in atomic physics to determine the wavenumber of spectral lines of many chemical elements.

$$\frac{h}{Mv} = \lambda$$

Wavelength is inversely related to Frequency

$$\frac{1}{\lambda} = \frac{R_H}{hc}\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

$$p/h = \tilde{\nu}$$

Wavenumbers are a inverse measure of Wavelengths

$$p^2 = E = Mv^2$$

Tetryonic geometry can be applied to Kinetic EM field variations produced by the emission and absorption of Photons by electrons in Nuclear orbits to reveal the geometry behind Rydberg's formula

$$p = \frac{E}{v} = h\nu$$

Compton frequency

$$\frac{Mv^2}{h} = f$$

EM Field — Planck quanta

$$12\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Photoelectron (EM fields) — ElectroMagnetic — mass — velocity

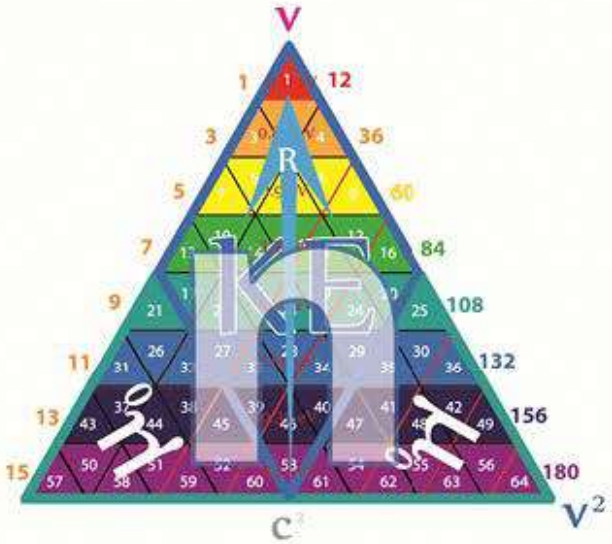
13.525 eV

$$Mv = \frac{KEM}{v} = h\nu$$

linear momentum — *longitudinal quanta*

Spectral line emissions reveals Rydberg's formula to be a measure of longitudinal KEM momenta

$$KEM = hcR$$



Wavelengths and Frequency are related through the velocity of propagation

$$\lambda_{KEM} = \frac{f}{v}$$

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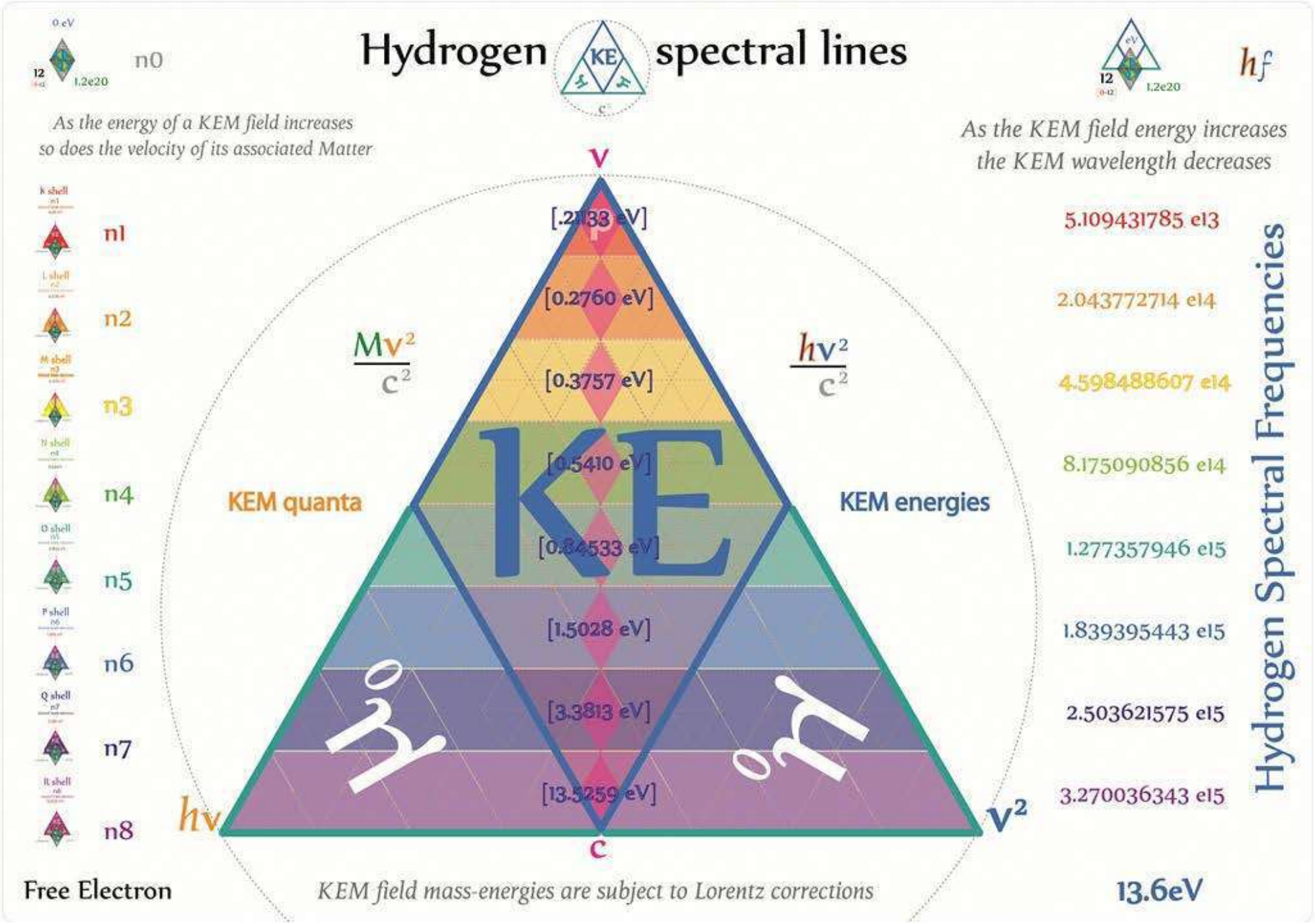

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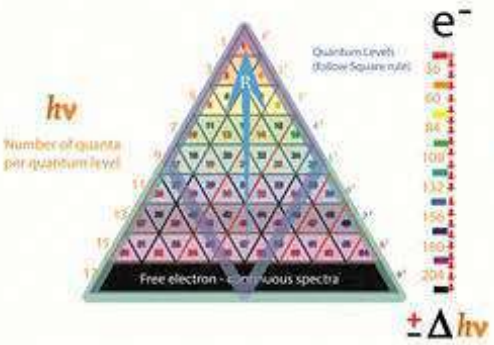
Absorption lines

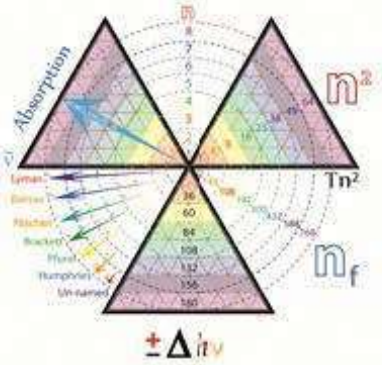
Increase in photo-electronic energies



$$\Delta 2h\nu = E = hf$$

When an electron 'absorbs' a photon of energy momenta it 'jumps' from one energy level to another, dependent on the energy and frequency of the incident photon

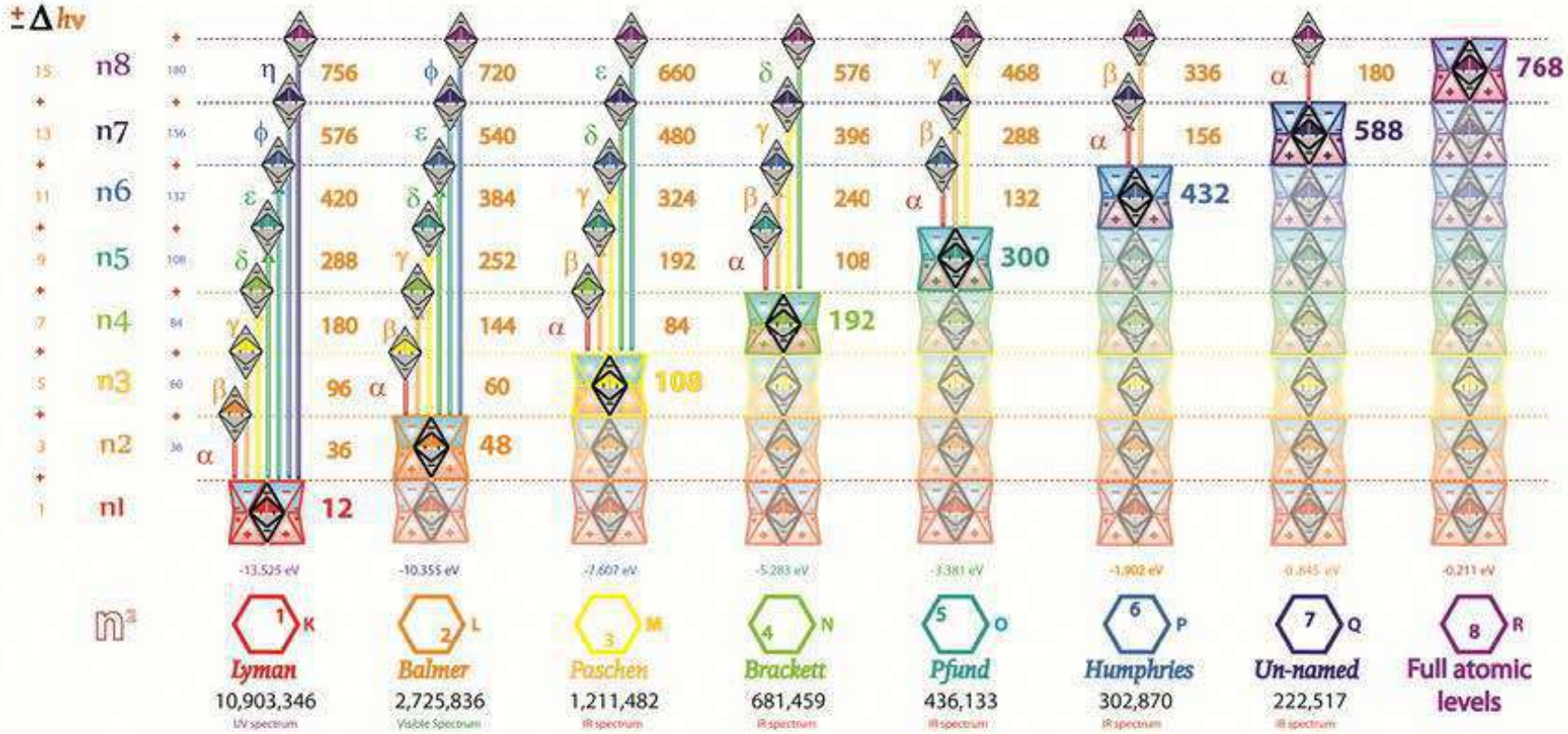
$$f = R_H\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$



The quantum level of the nuclei determines the ground quantum level of electrons within the nucleus
All transitions within the nulceus are discrete quantum jumps - outside the nucleus all spectra are continuous

KEM A Hydrogen photo-electron can only exist in specific energy levels below 13.525eV within the nucleus (any excess KE results in a unbound electron with KE - velocity)

KE in excess of 13.525 eV results in unbound electron



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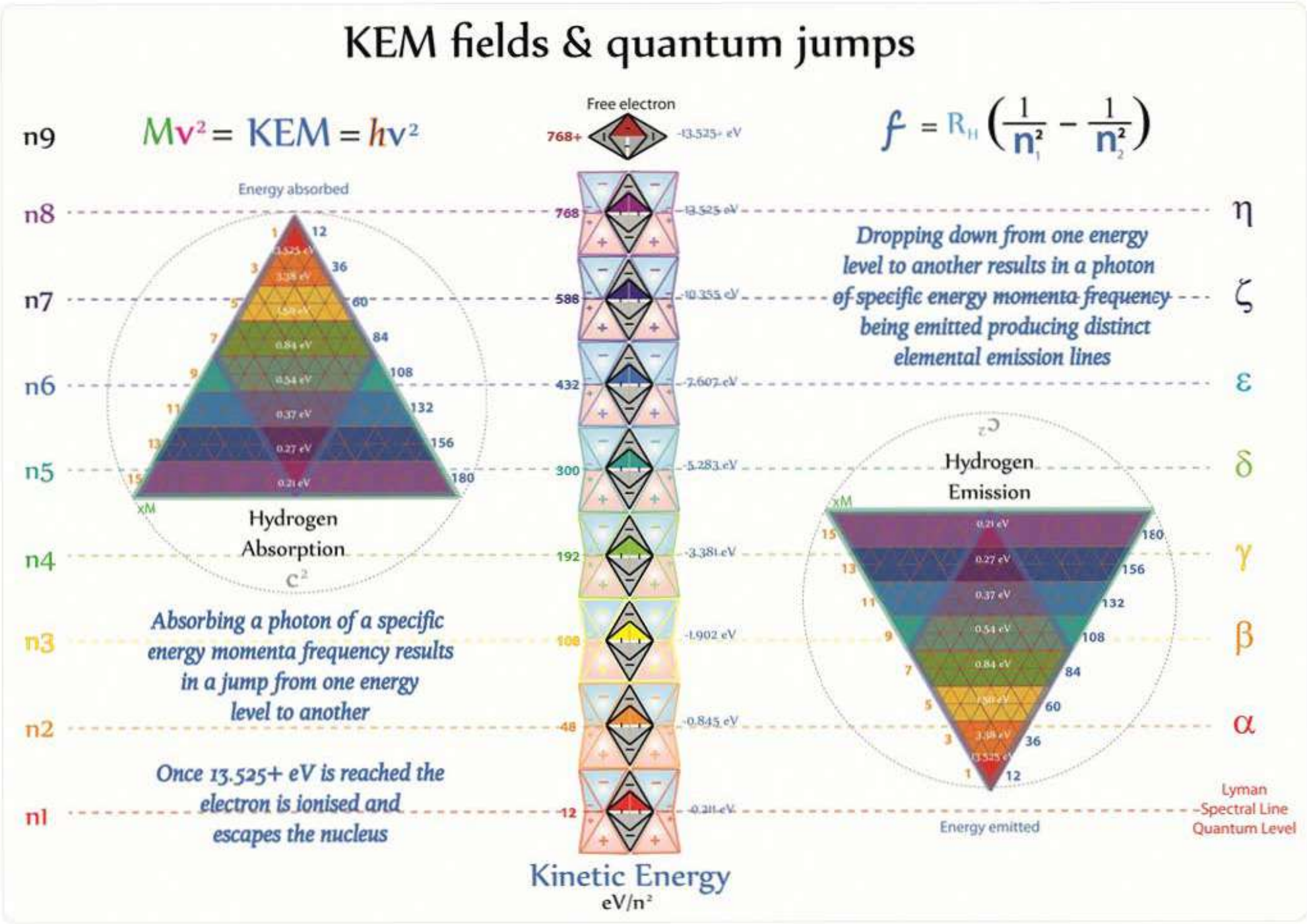
KEM fields & quantum jumps



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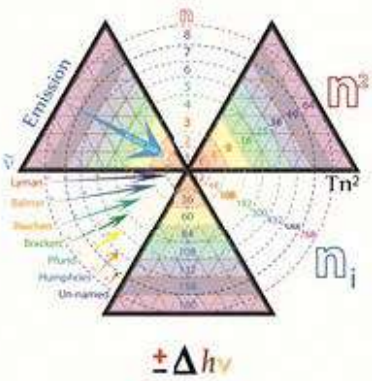
Emission lines

Decrease in photo-electronic energies

$$\Delta 2h\nu = E = hf$$

When an electron 'emits' a photon of energy momenta it 'drops' from one energy level to another dependent on the energy and frequency of the ejected photon

$$f = R_H\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$



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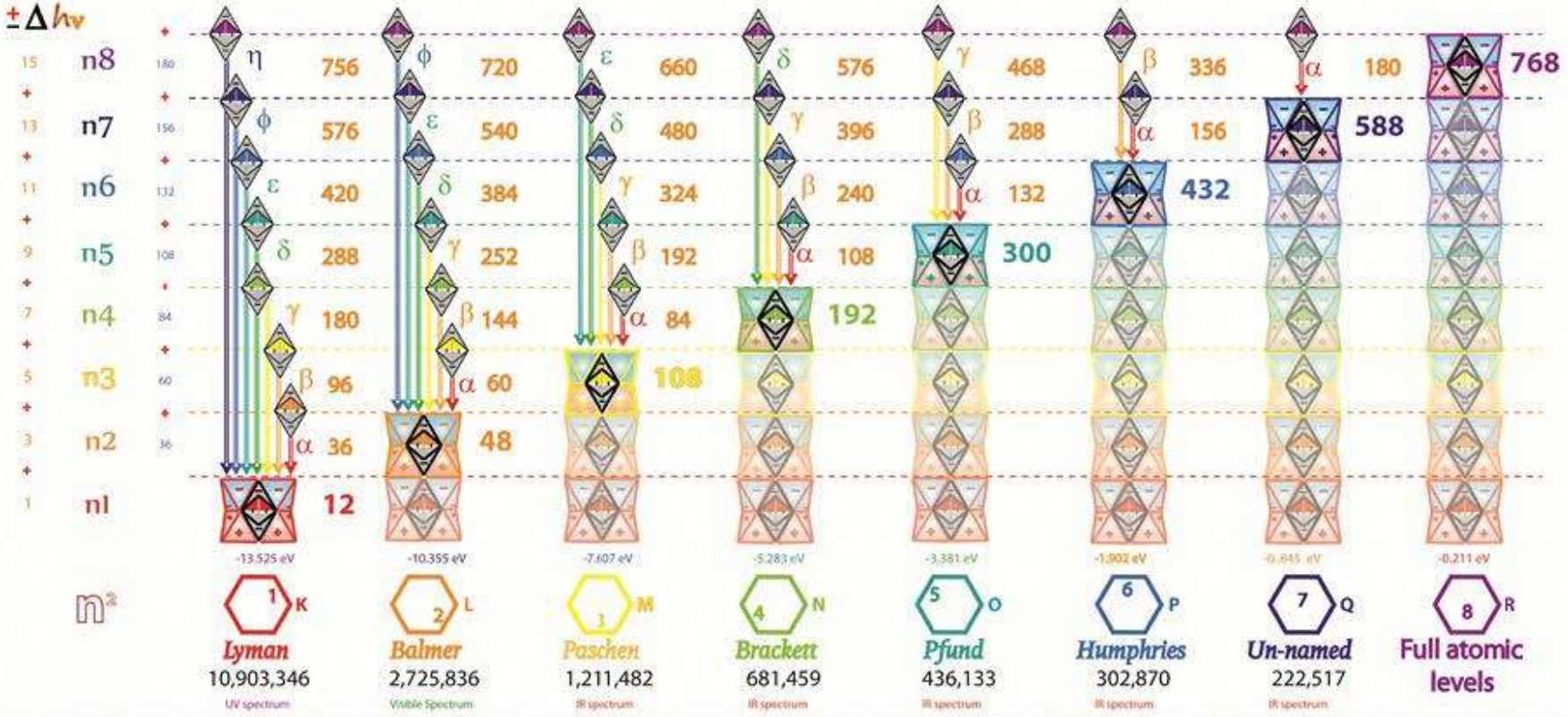
All transitions within the nulceus are discrete quantum jumps - outside the nucleus all spectra are continuous

KEM

A Hydrogen electron can only exist in specific energy levels below 13.525eV within the nucleus (any excess KE must be shed as Photons)

KE in excess of 13.525 eV results in unbound electron



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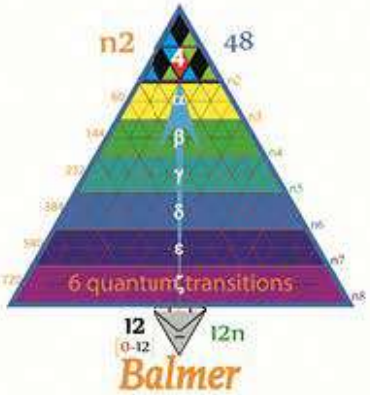
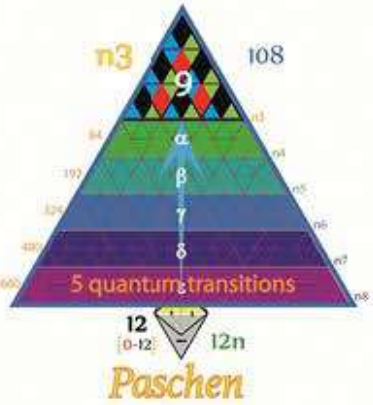
Spectral line series

(are produced by changes in linear momentum in photo-electric KEM fields due to atomic transitions of electrons between squared energy levels)

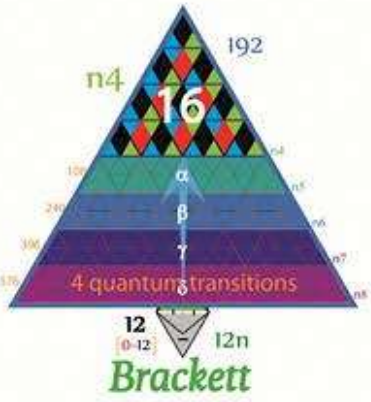
n1-8



n2-8



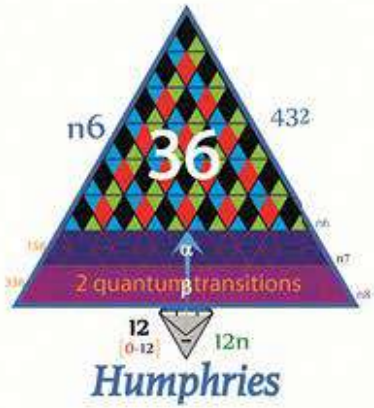
n3-8



n4-8

n5-8

n7-8



n6-8

Lyman	27.49545417
Balmer	109.9818167
Paschen	247.4590875
Brackett	439.9272667
Pfund	687.3863542
Humphries	989.8363501
Un-named	1,347.277254

Square root of Energy required to transition nuclear quantum levels

$$\left[\sqrt{756}\right].n^2$$

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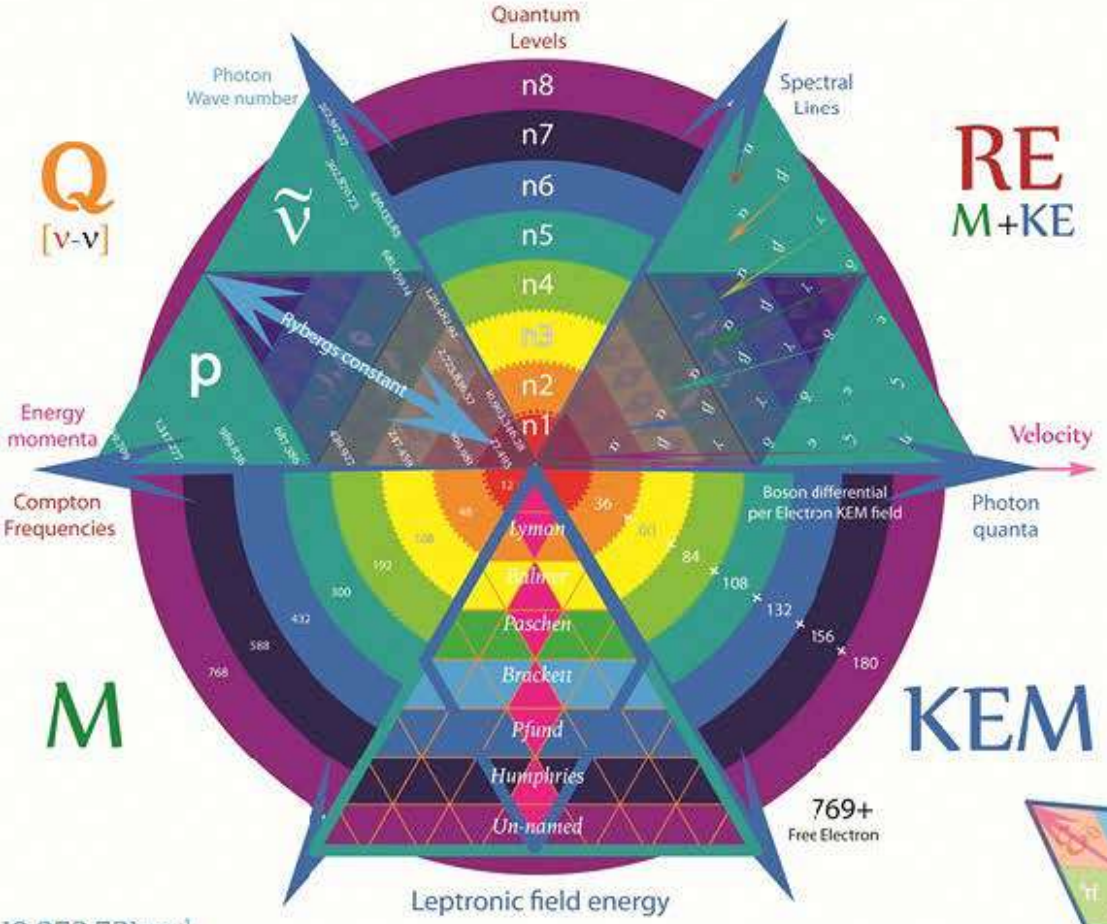
Rydberg's Constant

Johannes Robert Rydberg

(November 8, 1854 – December 28, 1919)



$$\tilde{\nu} = \frac{c}{27.49545}$$

$$f = \frac{c^2}{27.49545}$$

$$\lambda = \frac{27.49545}{c}$$

$$p = 27.49545$$

Q
[ν-ν]

RE
M+KE

$$R_H = \frac{c}{27.49545}$$

$1.0903346.28 \times 10^7$ m-1

$$\lambda = \nu / f$$

Using the Tetryonic model of a photo-electron and its associated quantum KEM energy levels we see that Rydberg's constant is a linear measure of the photo-electronic KEM field - and in turn directly related to its scalar energy-momenta through 'c'

$$R_H\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

M

KEM

Currently accepted value - 10,973,731 m^{-1}

Rydberg's Constant can be shown to be the square root of the total number of quanta required to transition a n1 electron to n8
(the highest quantum level possible in elemental nuclei)
as per Planck's heat law

Tetryonic theory value - 10,903,346 m^{-1}

$$p^2 = KEM = Mv^2$$

Quantum Jump

The energy momenta of emitted photons is a function of the photo-electron's KEM wavefunction

27.49545

KE
Photons

$$Mv^2 = KEM = hcR_H$$

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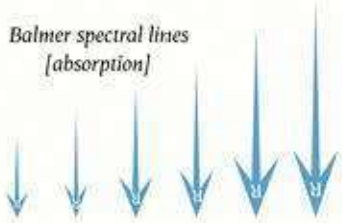
Wavenumbers and Planck's Law

Wavenumbers are revealed to be the number of quanta [nhv] required for a photo-electron to transition between specific quantum levels divided by the speed of light [c]

Balmer spectral lines [absorption]



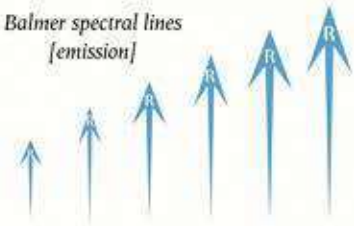
$$E = n[h\nu]$$

Wavenumbers are the number of Planck quanta required to reach a specific energy level

Max Karl Ernst Ludwig Planck

(April 23, 1858 – October 4, 1947)

Balmer spectral lines [emission]



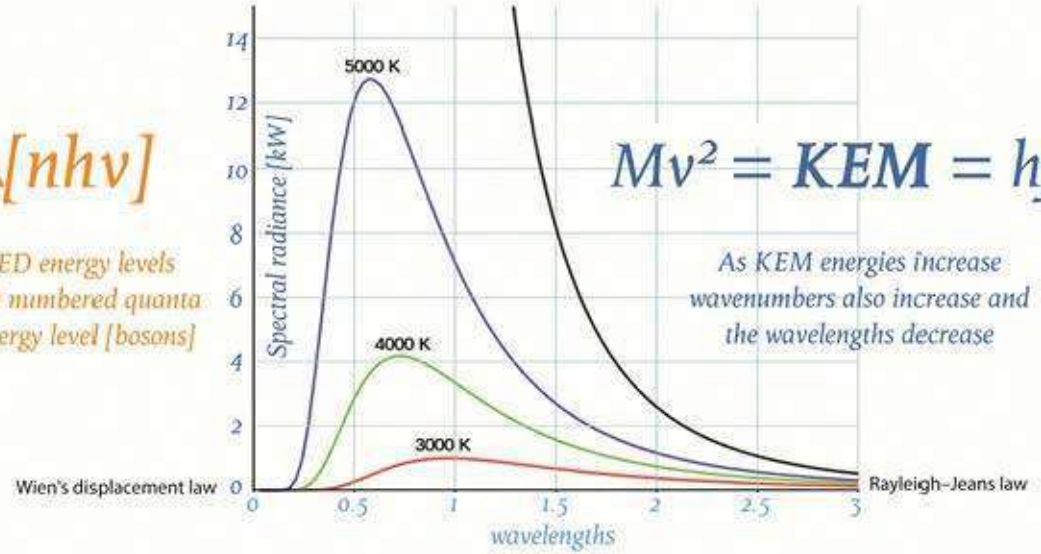
$$E = hc\tilde{\nu}$$

Photo-electrons emit and absorb photons to create blackbody radiation

Planck's law describes the electromagnetic radiation emitted by a black body in thermal equilibrium at a specific temperature

$$\Delta[nh\nu]$$

SQUARED energy levels have ODD numbered quanta in each energy level [bosons]



$$Mv^2 = KEM = hf$$

As KEM energies increase wavenumbers also increase and the wavelengths decrease

Spectral lines can be understood in quantum theory as differences between energy levels and proportional to wavenumber, frequency or wavelengths

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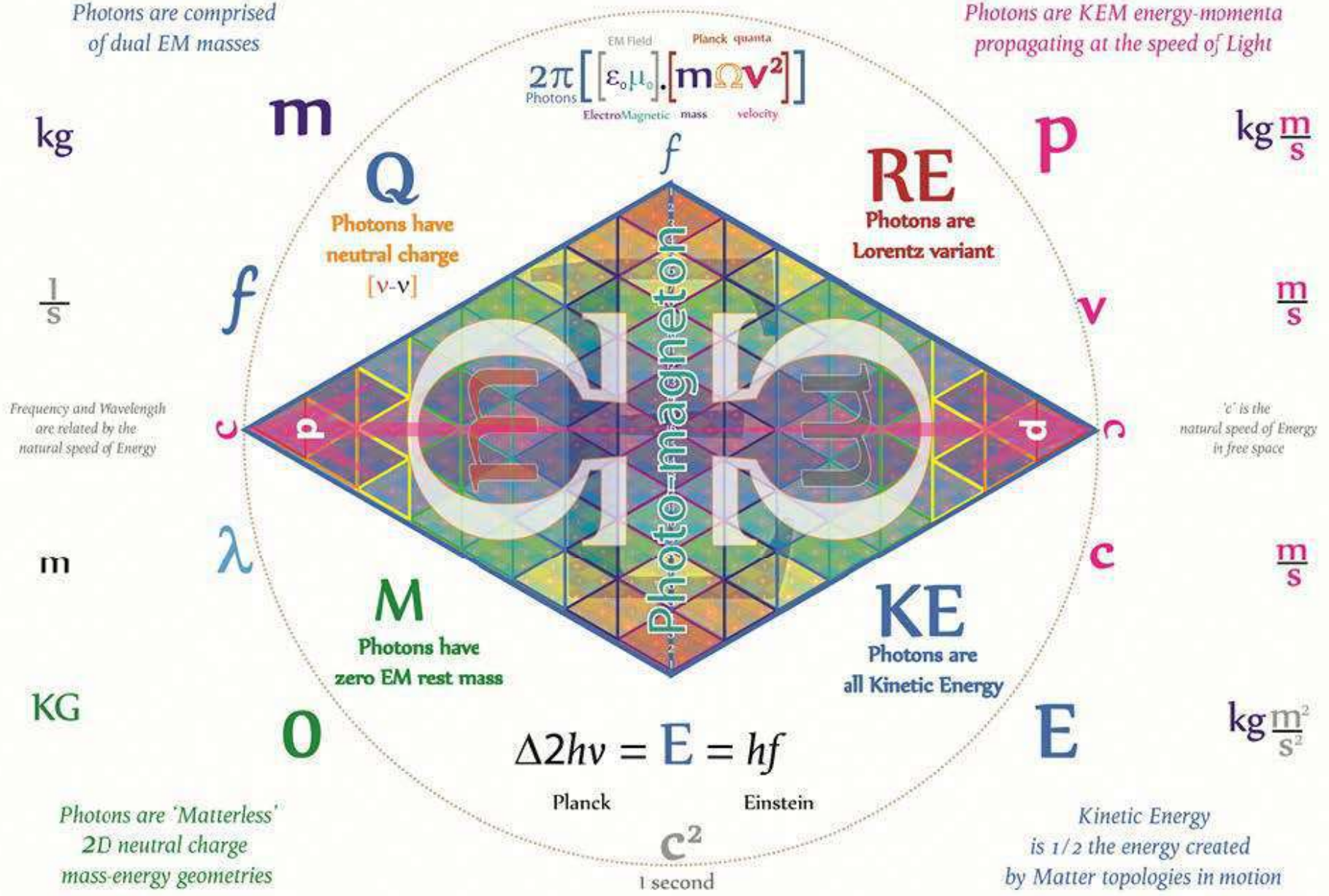
Kinetic mass-energy momenta relationships



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Relativistic Lorentz corrections

Hendrik Lorentz

(18 July 1853 – 4 February 1928)

$$\sqrt{1-\beta^2}$$

$$E=\frac{mc^2}{\sqrt{1-\frac{v^2}{c^2}}}$$

$$\sqrt{1-\left(\frac{v}{c}\right)^2}$$

The Lorentz transformation was originally the result of attempts by Lorentz and others to explain how the speed of light was observed to be independent of the reference frame and later expanded upon in an attempt to understand the creation of emfs in magnets and symmetries in electromagnetic forces

Einstein inlcuded the transformation in his theory of Special relativity [SR].

The Lorentz transformation supersedes the Galilean transformation of Newtonian physics, which assumes an absolute space and time.

According to special relativity, the Galilean transformation is a good approximation only at relative speeds much smaller than the speed of light.

Tetryonics expands upon all of this revealing this relationship as a result of the geometry of electromagnetic mass-energies in motion

rest mass-Matter — Energy

$$\frac{4n\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

mass — velocity — momentum

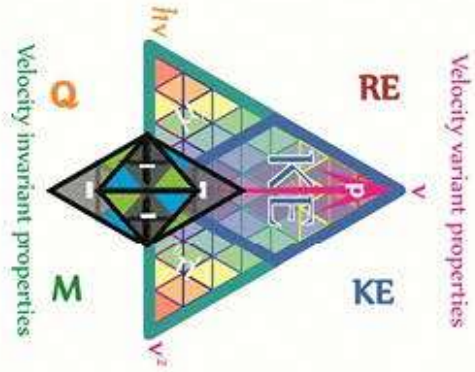
Planck quanta

spatial co-ordinate system

Matter is EM energy propagating at the 'speed of Light' in a standing wave energy topology

One of the greatest mistakes in relativistic mechanics is the application of Lorentz corrections to Matter.

It stems from there being no definition and enforced differentiation between EM mass and Matter



$$m = \frac{E}{c^2}$$

2D planar fields are relativisitic

radiant EM mass geometry

$$\frac{m}{c^2} = M$$

standing-wave Matter topology

3D standing-waves are velocity invariant

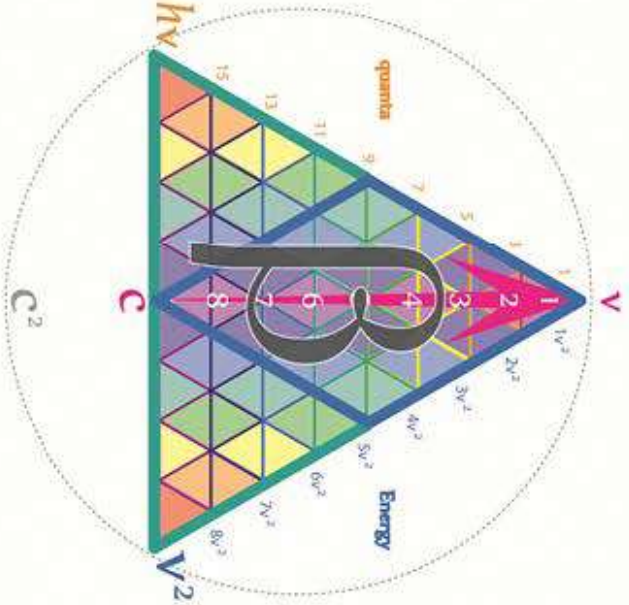
$$\frac{E}{c^4} = M$$

mass is a property of Matter - Matter is not a property of mass [they are directly related throught the velocity of light]

$$\beta = \left[\frac{v}{c}\right]$$

velocity is a result of vector forces

All 2D energy waveforms propagate at the 'speed of Light'



$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

The Kinetic Energy of Matter in motion is directly related to the square of the velocity

$$\gamma \equiv \frac{c}{\sqrt{c^2 - v^2}} = \frac{1}{\sqrt{1-\beta^2}} = \frac{dt}{d\tau}$$

The 'speed of Light' is a EM constant and is the limiting velocity achelvable by the electrical acceleration of Matter

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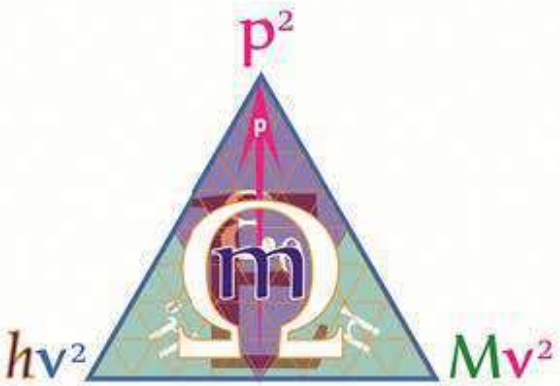
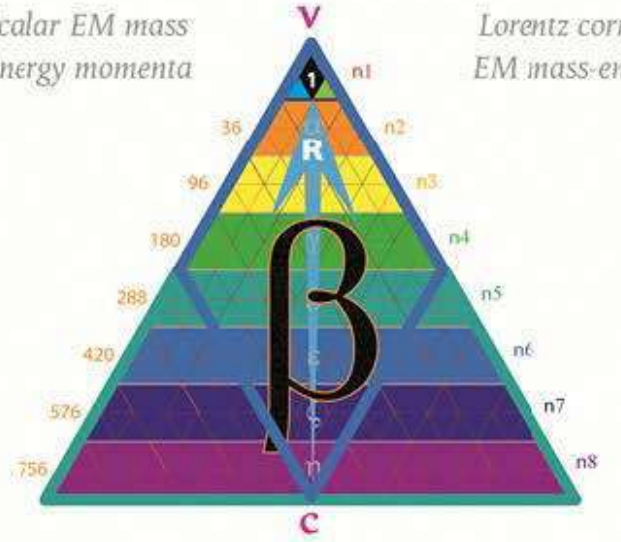
Spectral Energy relationships

$$kg\,\frac{m^2}{s^2}\quad E = p^2$$



Scalar EM mass -energy momenta



Lorentz corrected EM mass-energies

$$KEM = \frac{mv^2}{c^2}$$

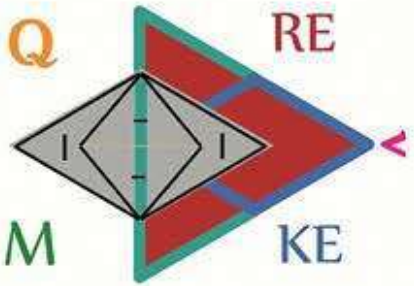
$$Mv^2 = KEM_{13.525\ eV} = hcR_H$$

All Spectral line emissions and absorptions produce changes in KEM energies, Angular momentum, Linear momentum, Frequency and Wavelengths

Linear

$$\left[\frac{\Omega}{c}\right] = \lambda$$

de Broglie wavelengths



The 'speed of Light' is the maximum velocity acheivable by electrical energies

Scalar

$$f = \left[\frac{c^2}{\Omega}\right]$$

Compton frequencies

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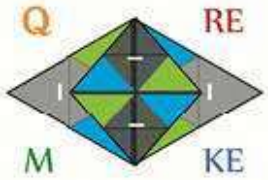
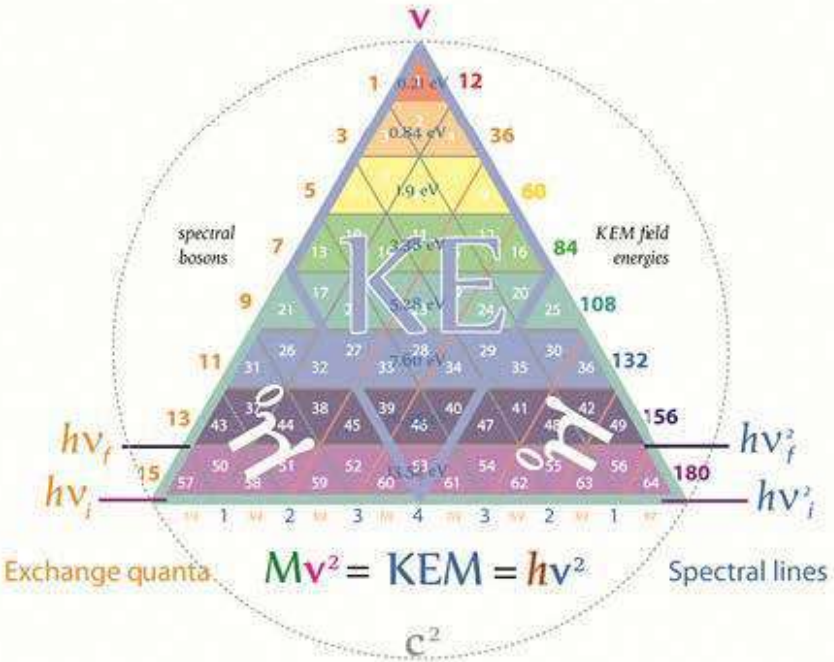
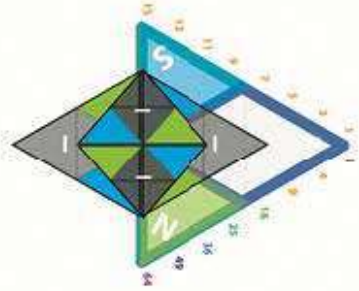
Spectral line photon production

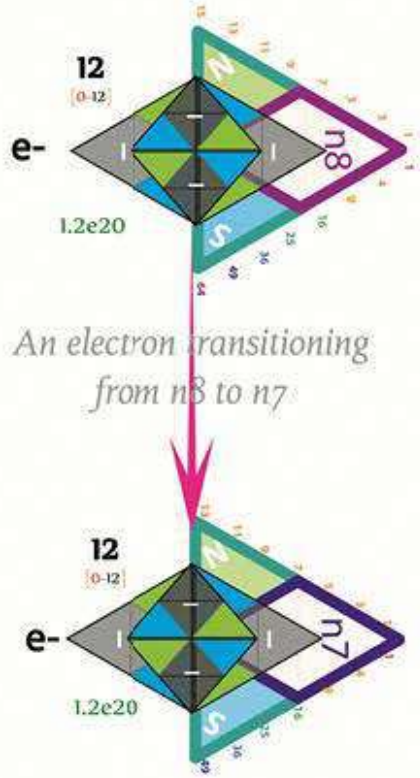


At no time does the 3D rest Matter-energy content of the electron change





Does so by emitting Kinetic Energy quanta



An electron transitioning from n8 to n7

$$E = hf$$

As the 3D rest Matter of any particle in motion is Lorentz invariant any changes in velocity-momentum produces changes to the mass-energy momenta content of the 2D KEM field
[boson changes are the difference of two squares]

Which are released as photons of specific energy-momenta

Spectral line wavenumbers

Tetryonic

$$\left(\frac{15 \diagup 49}{64}\right)$$

.0047

$$\frac{1}{\lambda}$$

Rydberg

$$R\left(\frac{1}{49} - \frac{1}{64}\right)$$

.0047

of specific wavelengths (Spectral Lines)

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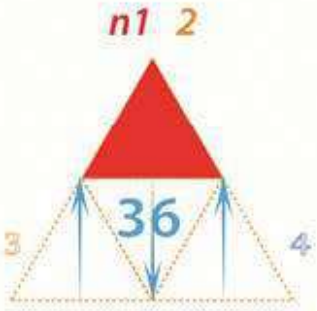
Wavenumbers

are the number of energy momenta wavelengths per unit distance

n



48

1 quantum level jump

α

108

2 quantum level jump

β

192

3 quantum level jump

γ

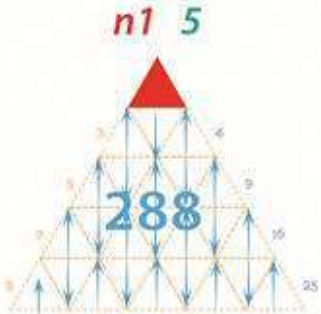
m

$\tilde{\nu}$

the wavenumber (also wave number) is the spatial frequency of a wave. either in quanta per distance or nπ radians per unit distance. It can be envisaged as the number of specific wavesets that exist over a specified distance

$1/\lambda$

m^{-1}



300

4 quantum level jump

δ

432

5 quantum level jump

ε

588

6 quantum level jump

ζ

768

7 quantum level jump

η

For electromagnetic radiation in vacuum, wavenumber is proportional to frequency and to photon energy

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Bosons, Photons and quantums of energy momenta

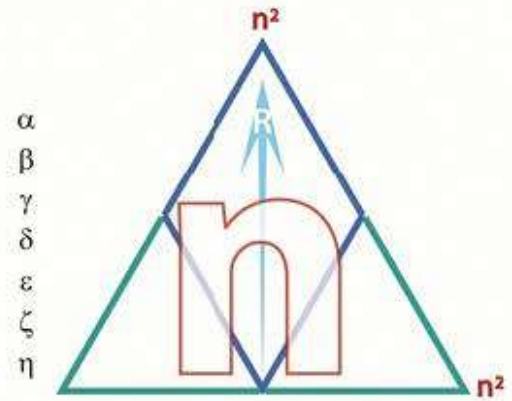
$\tilde{\nu}$ WAVENUMBERS $E = \Sigma h\nu$

$KEM = Mv^2$ LINEAR MOMETNUM p

γ Spectral lines are produced $\Delta m\Omega v = \Delta mv = \Delta p$ by accelerating electrons a

equilateral energy momenta is the foundation of all quantum EM wave-functions

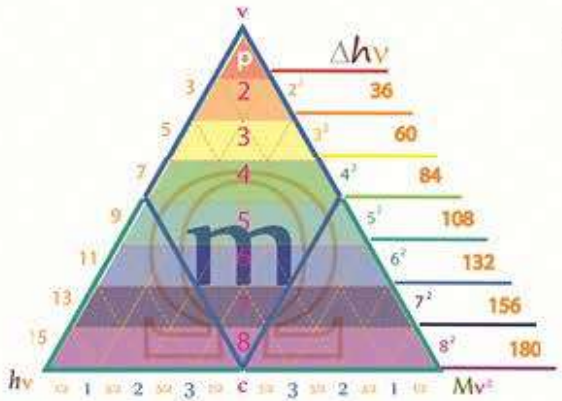
ODD distribution $2\nu = f$ **SQUARED distribution**



Spectral lines

Bosons

$h\nu$



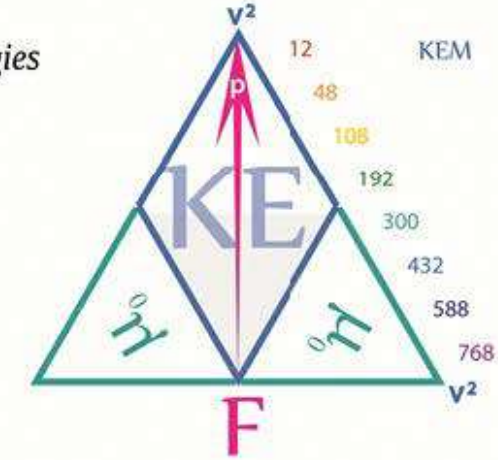
EVEN distribution

hf

Photons

Kinetic energies

$h\nu^2$



energy momenta

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Spectral Energy - Planck relationships

$$\frac{E}{v^2} = \frac{m}{\Omega} = \frac{E}{c^2}$$

deBroglie wavelength λ

Planck quanta differential

spectral mass-energies

f Frequency

p MOMENTUM

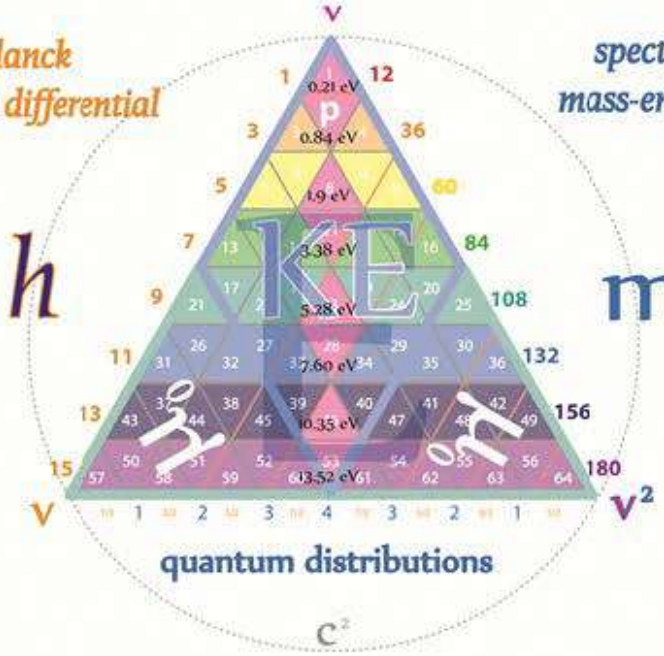
h

m

ENERGY E

Wave number $\tilde{\nu}$

v^2 Compton Frequency



Applying mass to spectral energy relationships reveals the familiar quantum mechanical wave-particle relationships and properties

	2D waves						3D Matter	
EM wave wavelength	Ω / c	=	planck constant	h / p	linear momentum	=	$m\Omega / mc$	deBroglie wavelength
EM wavenumber	c / Ω	=	linear momentum	p / h	planck constant	=	$mc / m\Omega$	Matter waves
EM wave Frequency	c^2 / Ω	=	kinetic energy	E / h	planck constant	=	$mc^2 / m\Omega$	Compton Frequency

Thus reinforcing the geometric role of quantised angular momenta in Planck's constant

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White Light

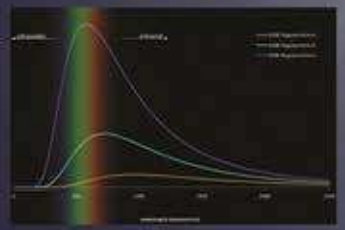
White light is radiated by our SUN and all the stars throughout the Universe.
In fact, most of the energy radiated by the sun is within the visible spectrum, which is most likely why we see this range.

Incandescence is the greatest known generator of white light. The verb incandesce means to glow white. This is also referred to as black-body radiation.

The color of a black body object at high temperatures causes it to glow, and the waves emitted include visible light.
In addition to the sun and common light bulb, molten materials such as metal or glass also glow incandescently.

Spectroscopy

Planck's Heat Law



Most light sources are thermal, meaning the type of radiation they emit is a characteristic of the source's temperature.

White light can be decomposed or reconstituted by passing it through a Prism

[Spectroscopy]

White light is comprised of many photons of varying frequencies and wavelengths

Each colour of light has a specific frequency and wavelength

Until Newton's work proved otherwise, most scientists believed that white was the fundamental color of light; and that other colors were formed only by adding something to light. Newton demonstrated this was not true by passing white light through a prism, then through another prism. If the colors were added by the prism, the second prism should have added further colors to the single-colored beam. Since the single-colored beam remained a single color, Newton concluded that the prism merely separated the colors already present in the light.

White light is the result of superpositioning of the visible colors [varying frequencies] of EM waves

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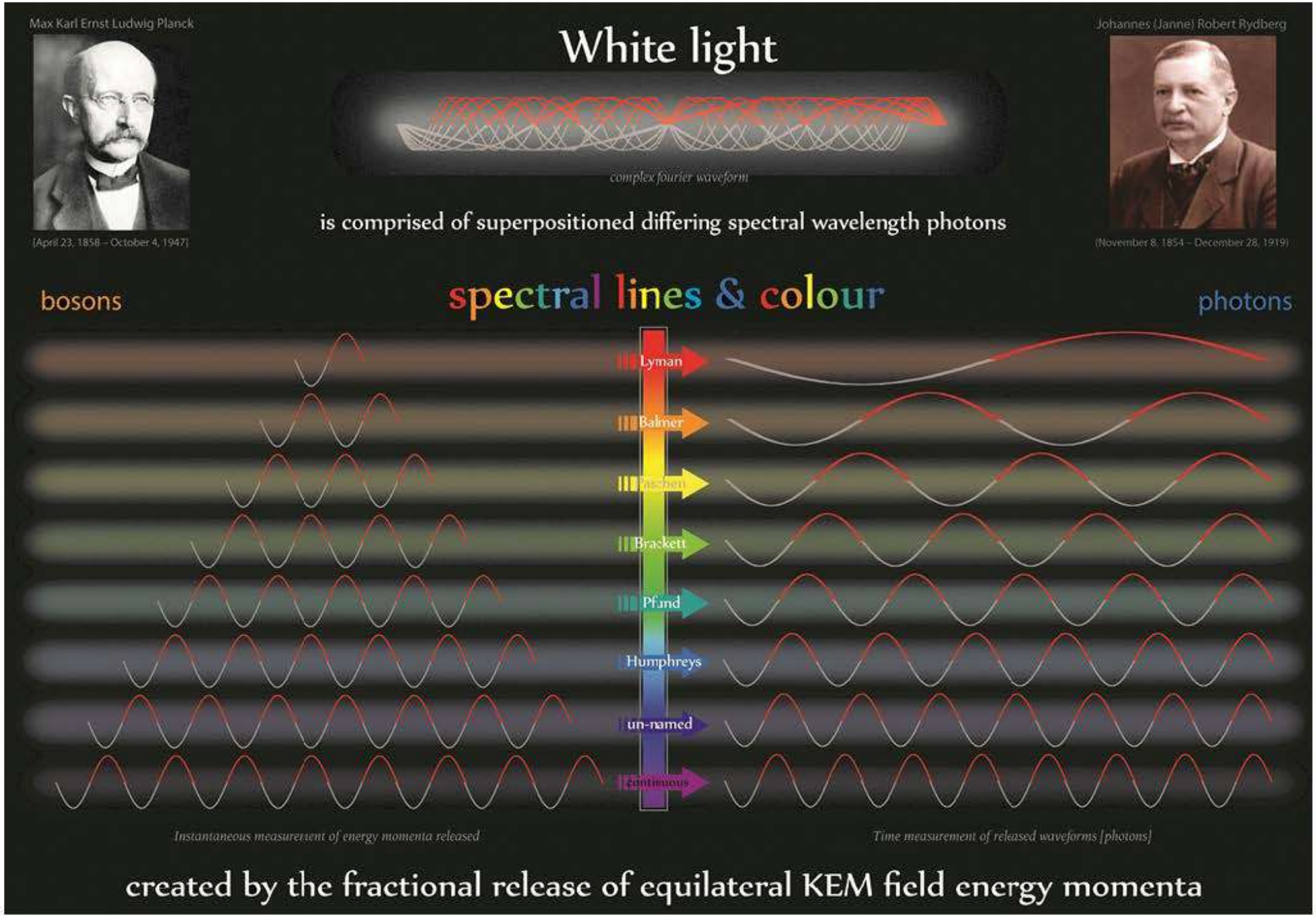

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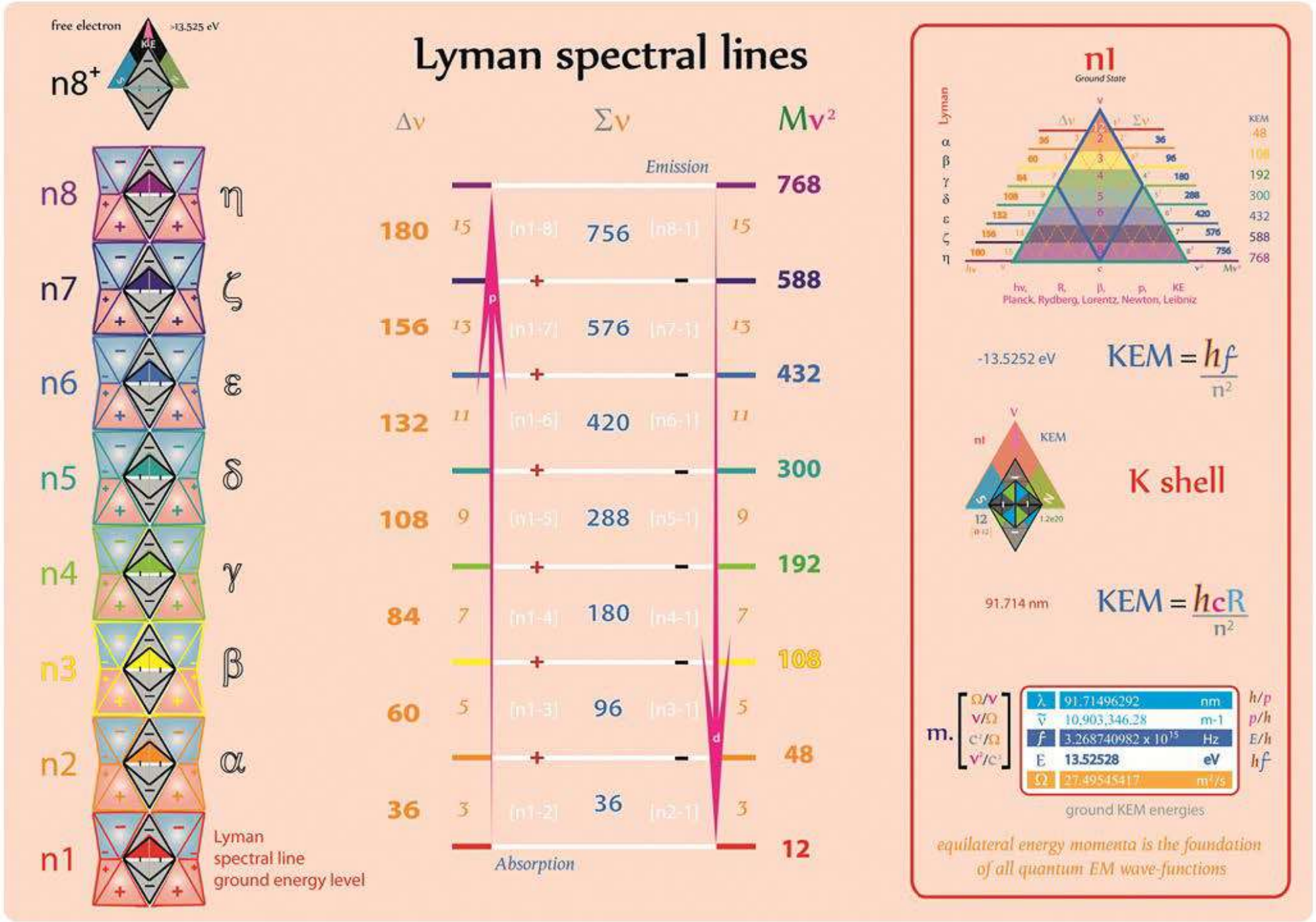

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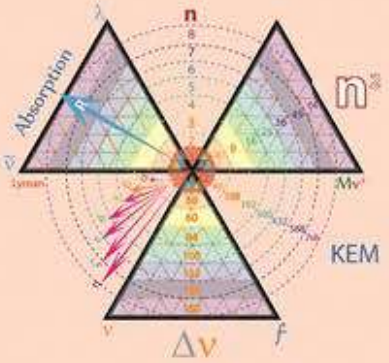
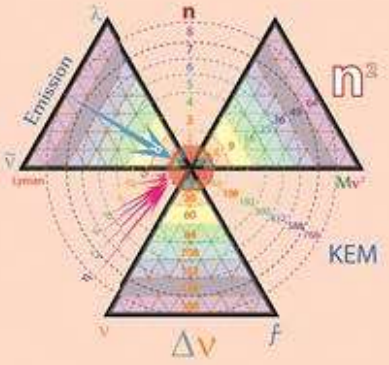
As photo-electrons transition between Mv squared KEM field energy levels in atomic nuclei they release specific [Δhν] W bosons



Lyman spectral series

α	122.28	n1-2
β	103.18	n1-3
γ	97.83	n1-4
δ	95.53	n1-5
ε	94.33	n1-6
ζ	93.62	n1-7
η	93.17	n1-8

UV spectrum



K shell

$$\frac{\Delta\nu}{KEM}$$

36

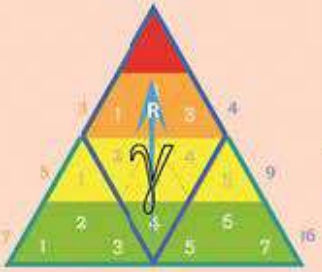
48

1 quantum level jump

96

108

2 quantum level jump



180

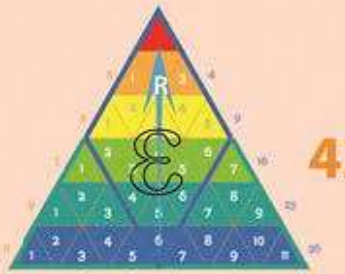
192

3 quantum level jump

288

300

4 quantum level jump



420

432

5 quantum level jump

576

588

6 quantum level jump

756

768

7 quantum level jump

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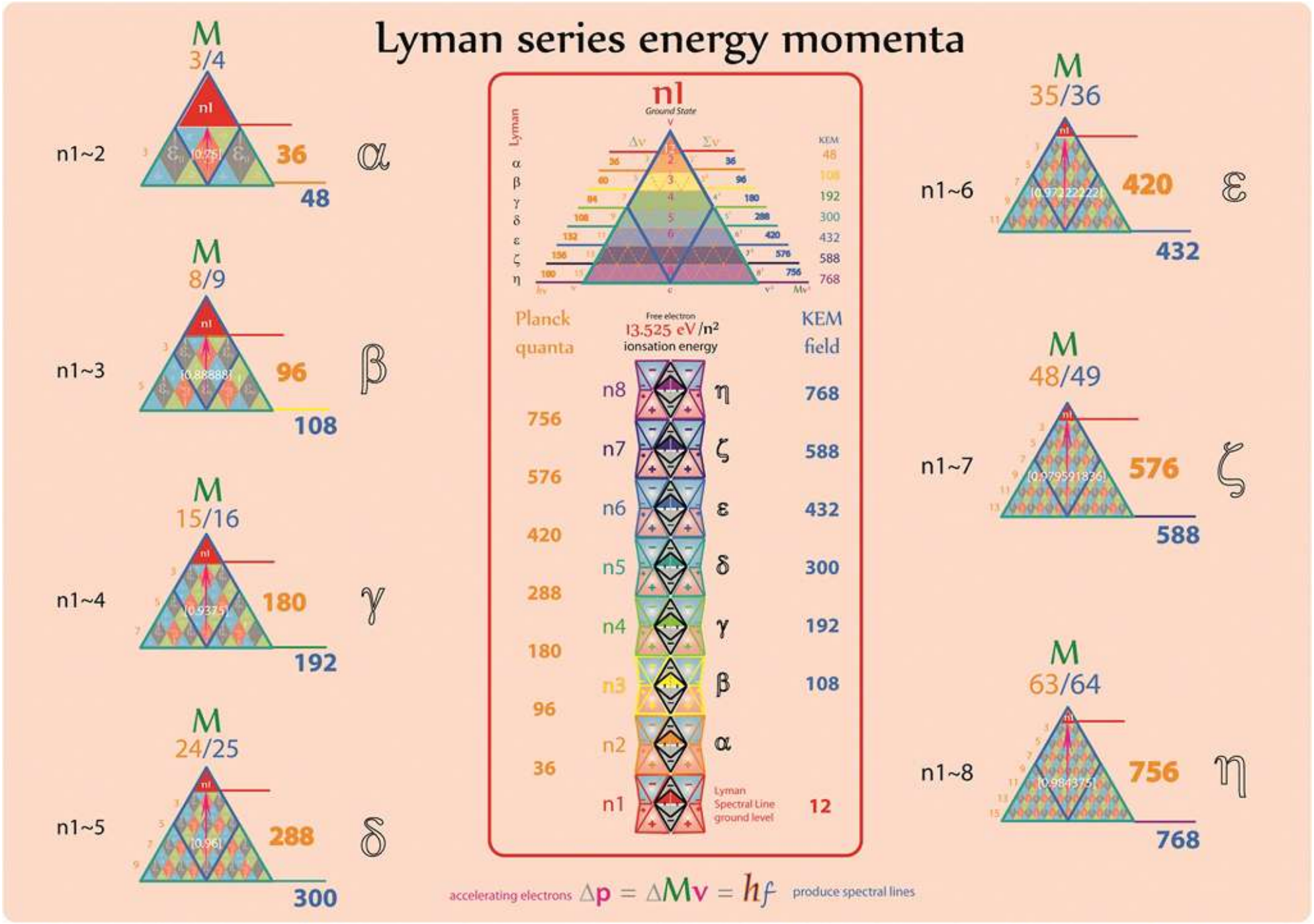
Lyman series energy momenta



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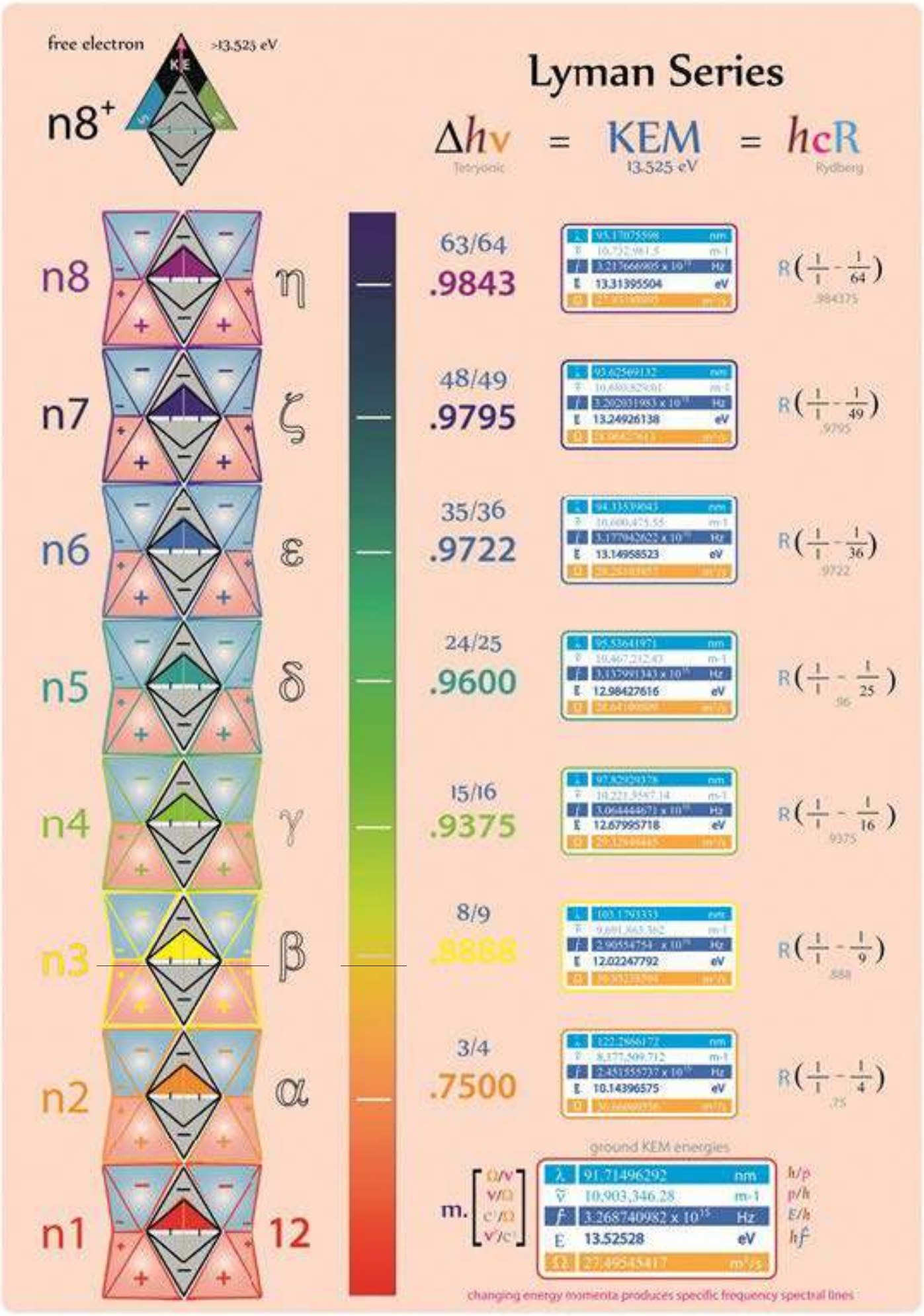

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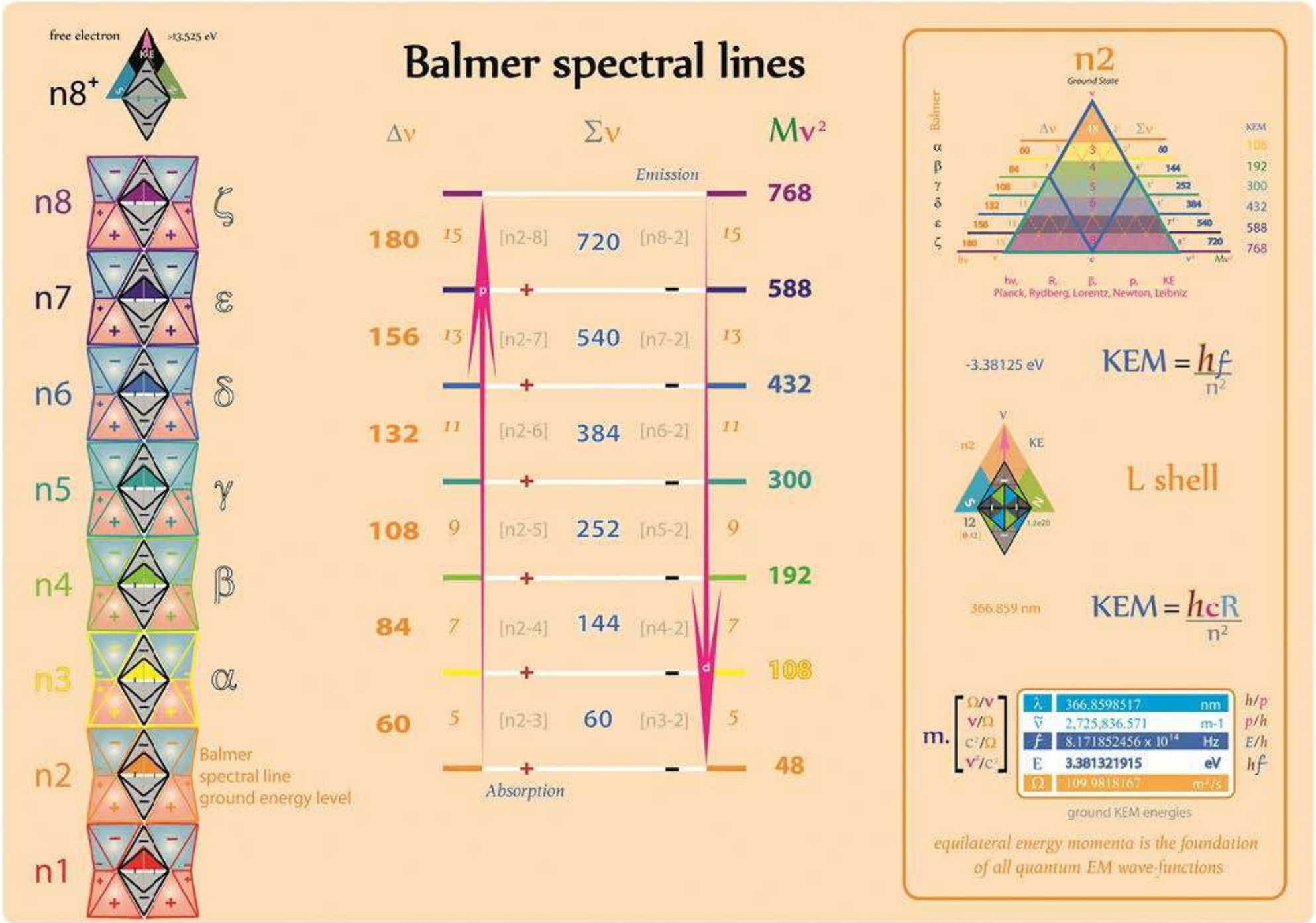

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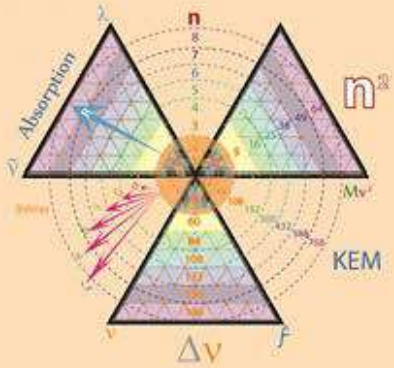
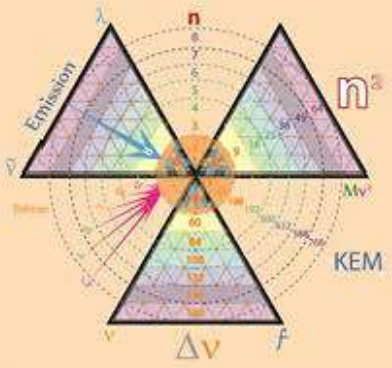
As photo-electrons transition between Mv squared KEM field energy levels in atomic nuclei they release specific [Δhν] W bosons



Balmer spectral series

α	656.28	n2-3
β	489.14	n2-4
γ	436.73	n2-5
δ	412.71	n2-6
ε	399.46	n2-7
ϕ	391.31	n2-8

Visible Spectrum



L shell

$$\frac{\Delta\nu}{KEM}$$

60

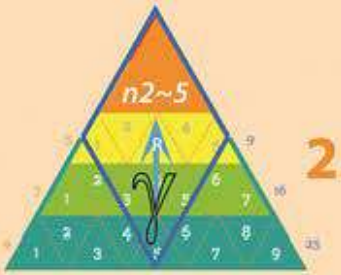
108

1 quantum level jump

144

192

2 quantum level jump



252

300

3 quantum level jump

384

432

4 quantum level jump

540

588

5 quantum level jump

720

768

6 quantum level jump

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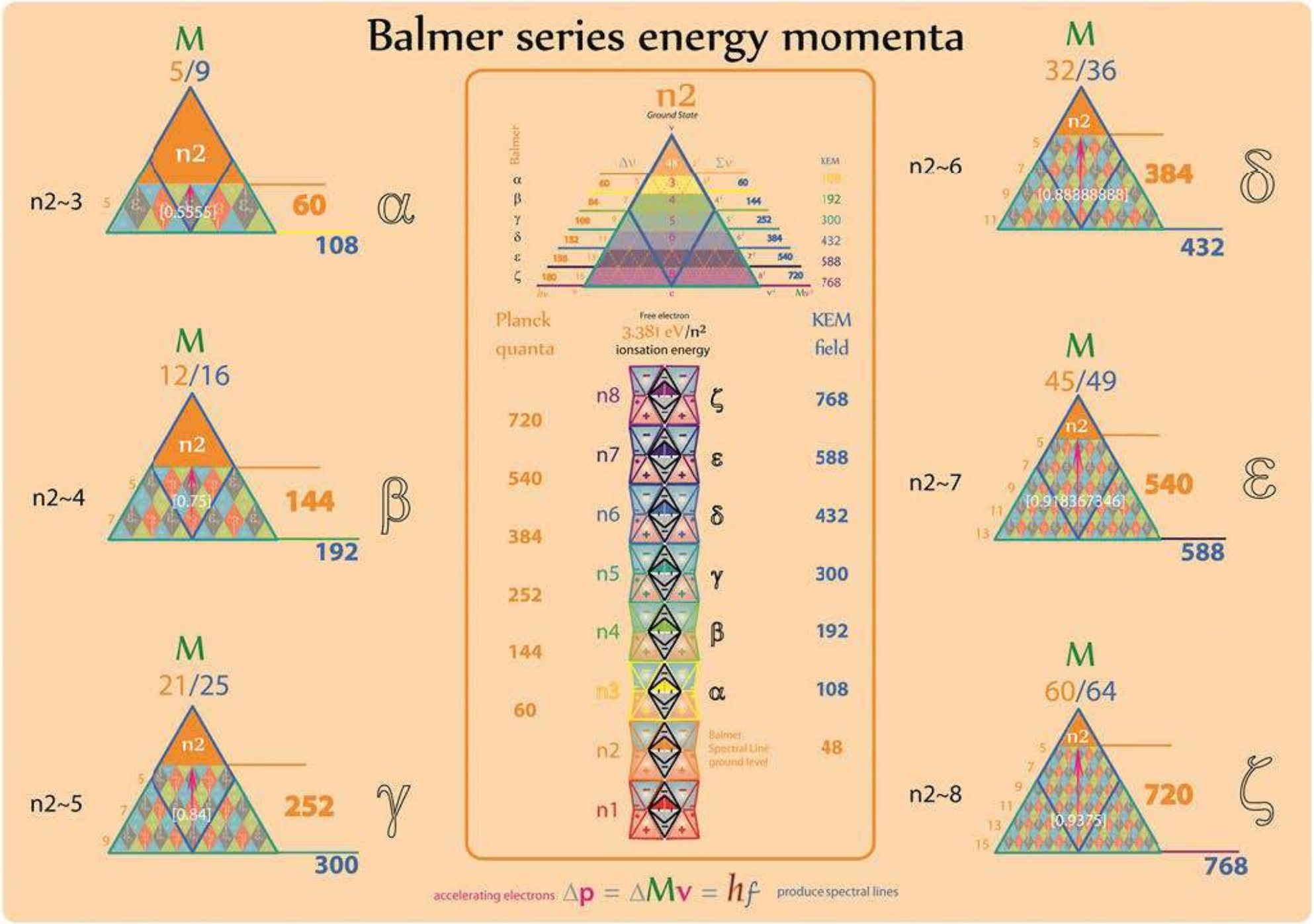
Balmer series energy momenta



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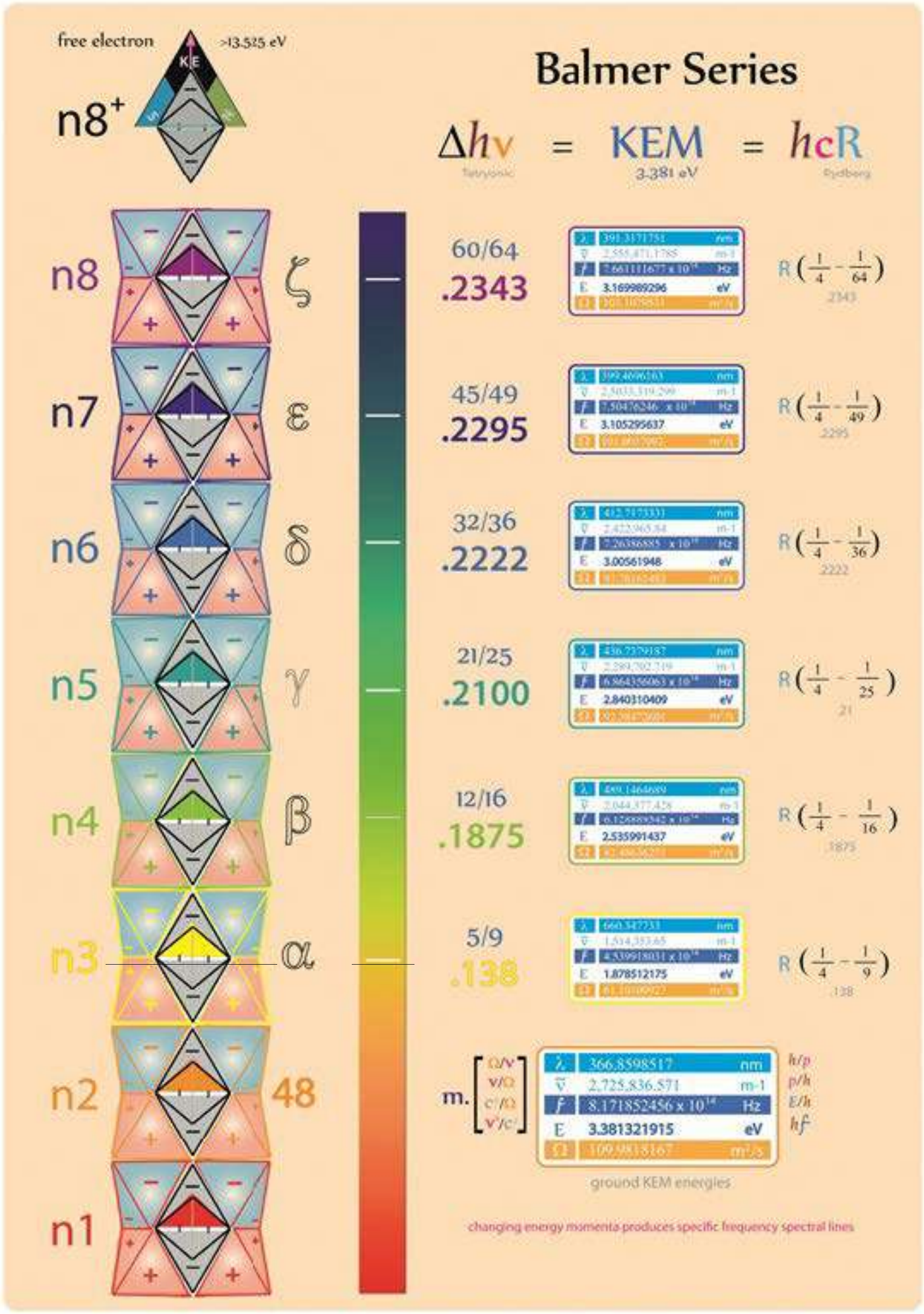

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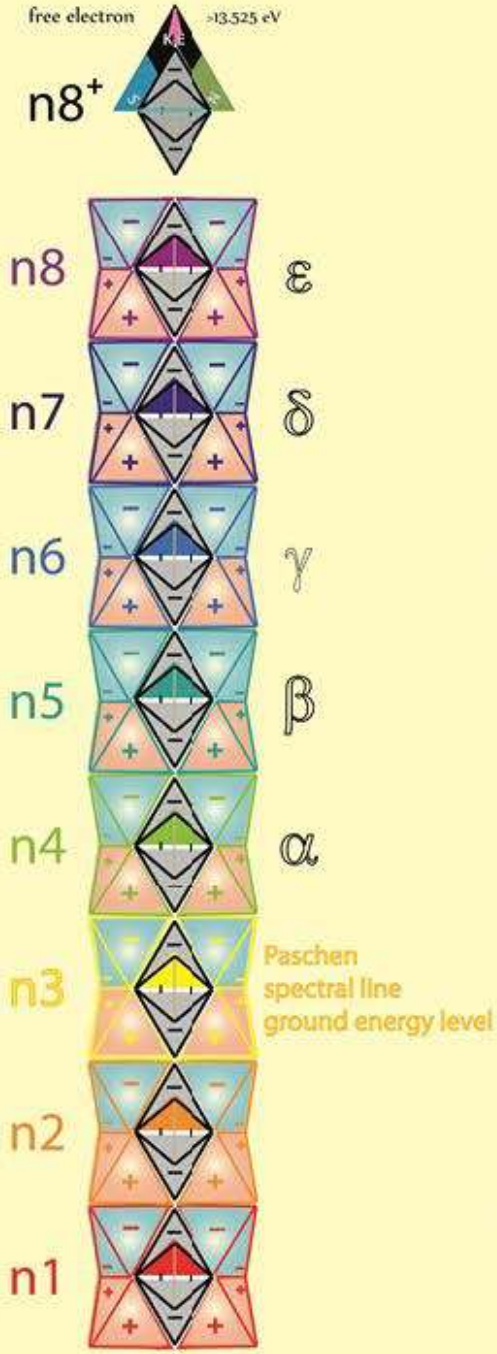
Paschen spectral lines



-1.50280974 eV

$$KEM = \frac{hf}{n^2}$$

M shell

825.434 nm

$$KEM = \frac{hcR}{n^2}$$

$$m.\begin{bmatrix} \Omega/v \\ v/\Omega \\ c^2/\Omega \\ v^2/c^2 \end{bmatrix}$$

λ	825.4346663	nm	h/p
ν̃	1,211,482.92	m-1	p/h
f	3.631934425 x 10^{14}	Hz	E/h
E	1.50280974	eV	hf
Ω	247.4590875	m^2/s	

ground KEM energies

equilateral energy momenta is the foundation of all quantum EM wave-functions

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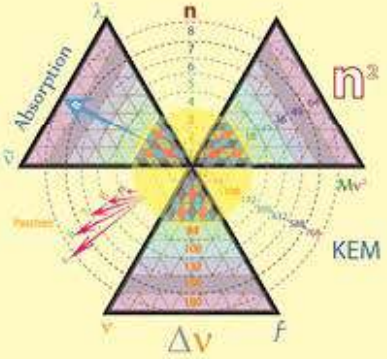
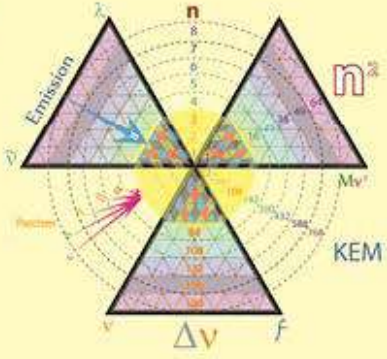
As photo-electrons transition between Mv squared KEM field energy levels in atomic nuclei they release specific [Δhν] W bosons



Paschen spectral series

α	1,886	n3-4
β	1,289	n3-5
γ	1,100	n3-6
δ	1,011	n3-7
ε	960	n3-8

IR spectrum



M shell

$$\frac{\Delta\nu}{KEM}$$

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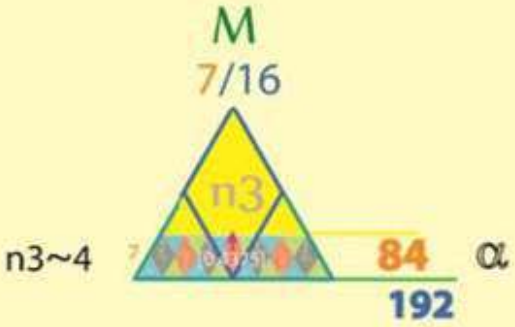
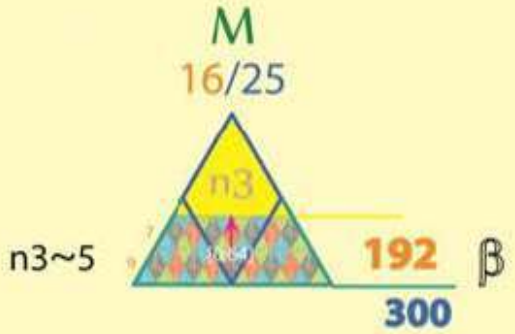
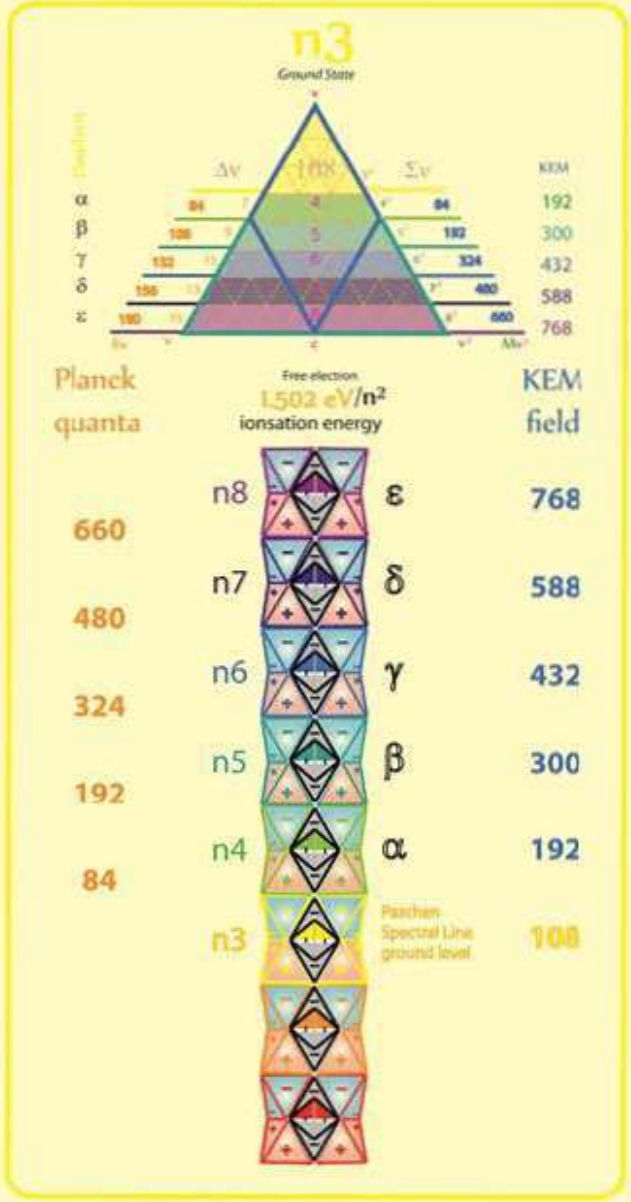
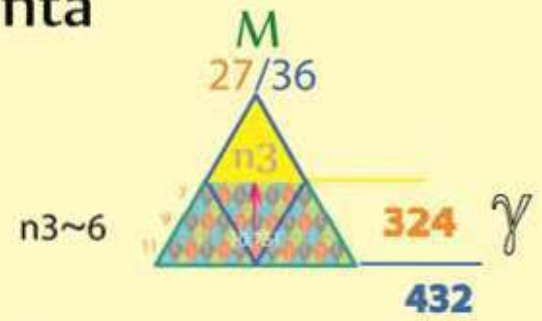
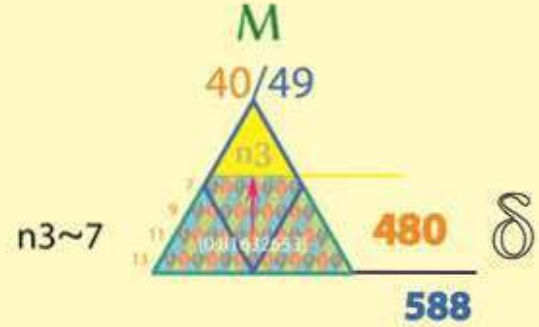
Paschen series energy momenta

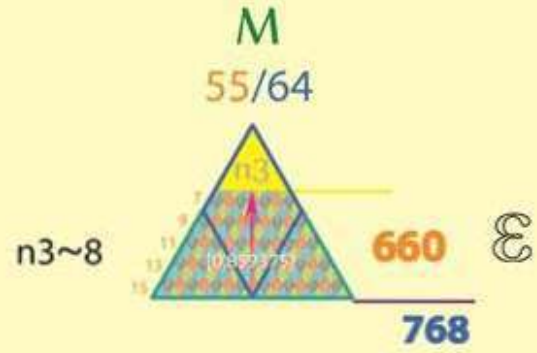












accelerating electrons $\Delta p = \Delta M v = hf$ produce spectral lines

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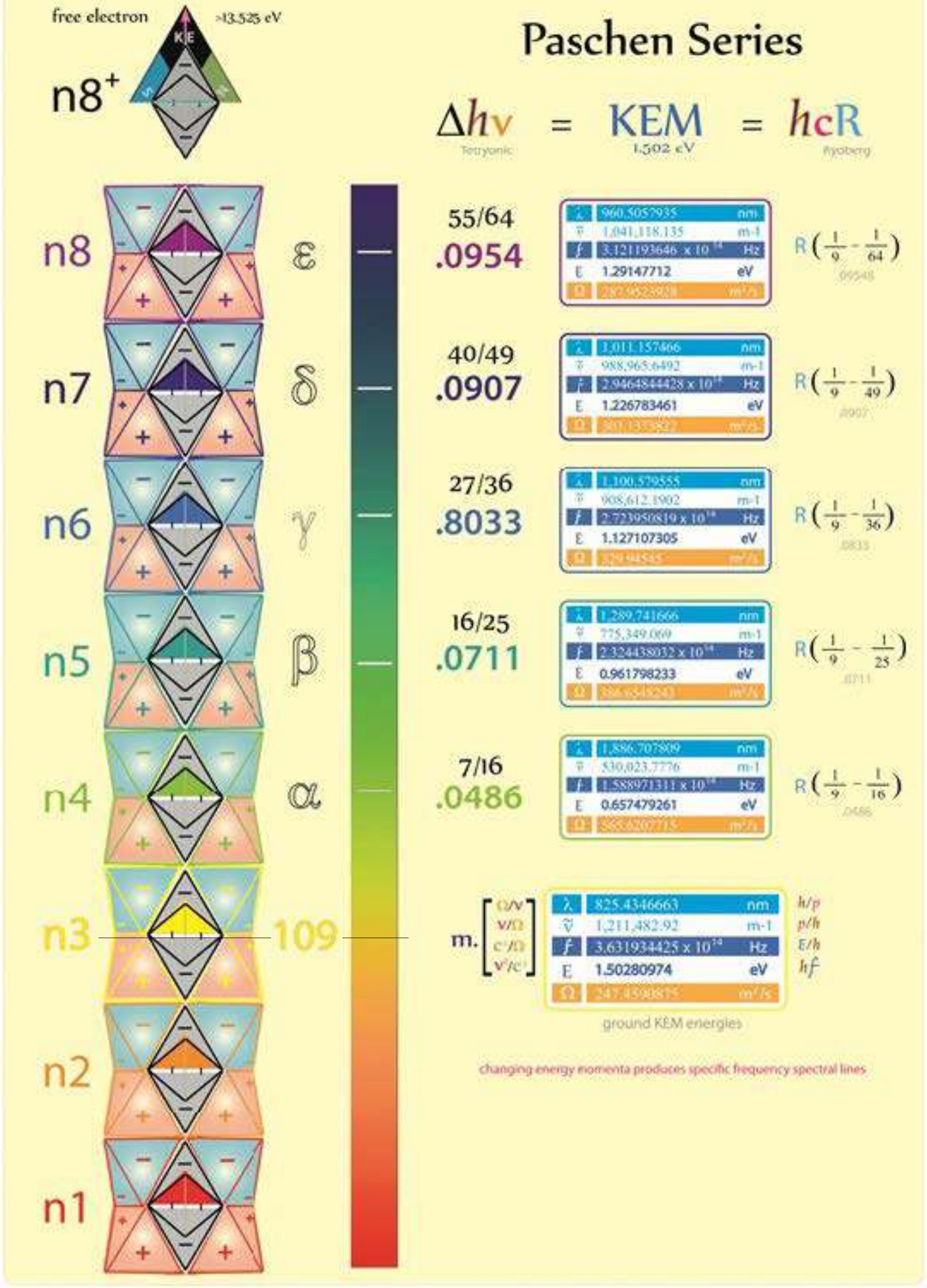

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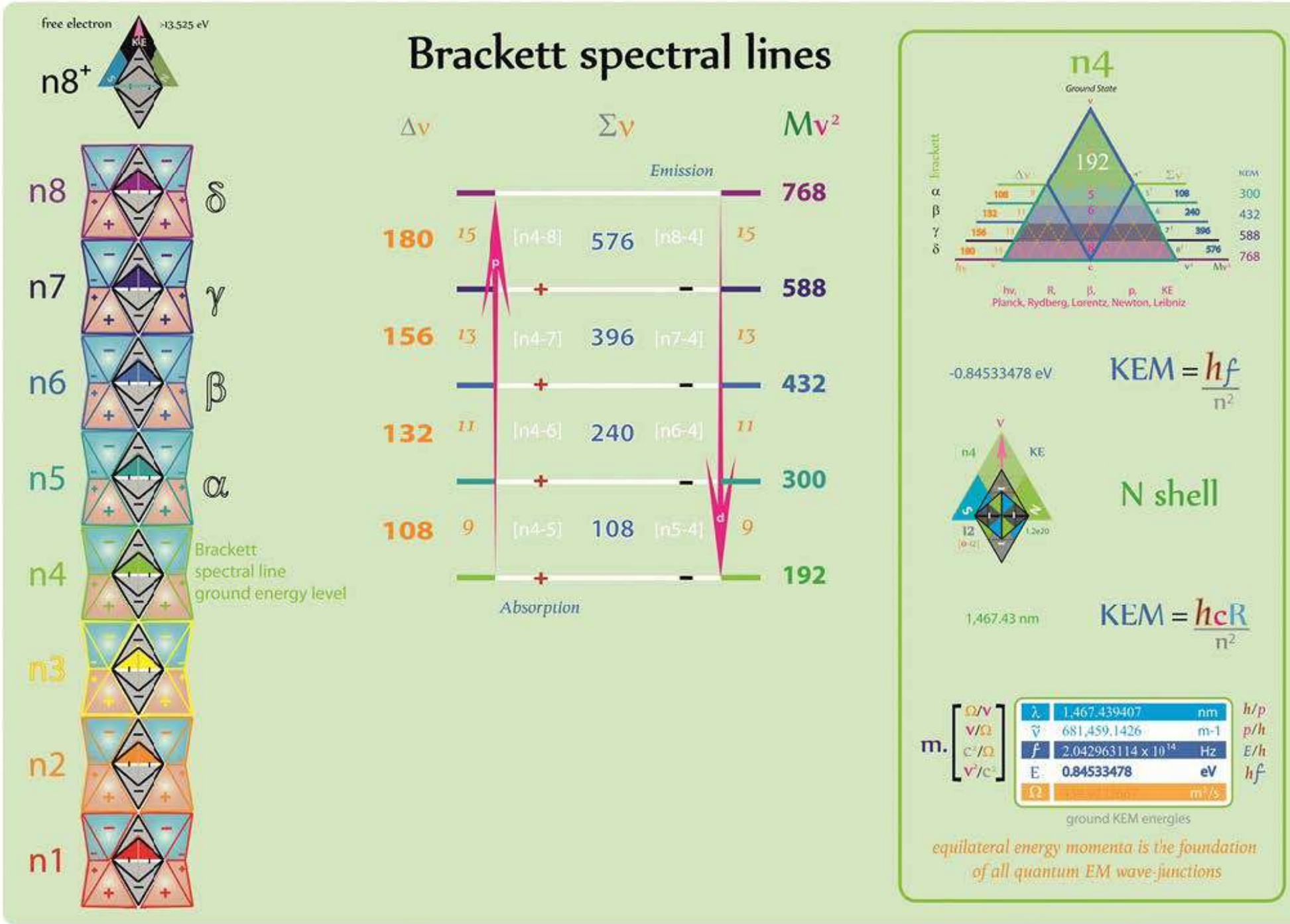

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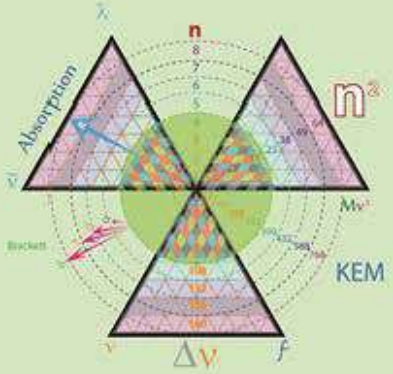
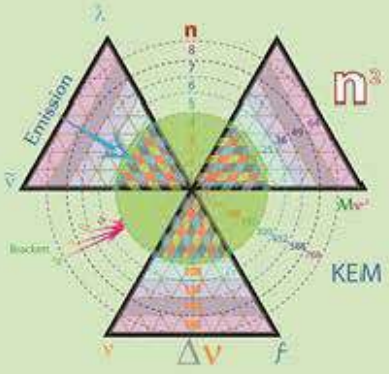
As photo-electrons transition between Mv squared KEM field energy levels in atomic nuclei they release specific [Δhν] W bosons



Brackett spectral series

α	4,076	n4-5
β	2,641	n4-6
γ	2,178	n4-7
δ	1,956	n4-8

IR spectrum



N shell

$\frac{\Delta\nu}{KEM}$

108

300

1 quantum level jump

240

432

2 quantum level jump

396

588

3 quantum level jump

576

768

4 quantum level jump

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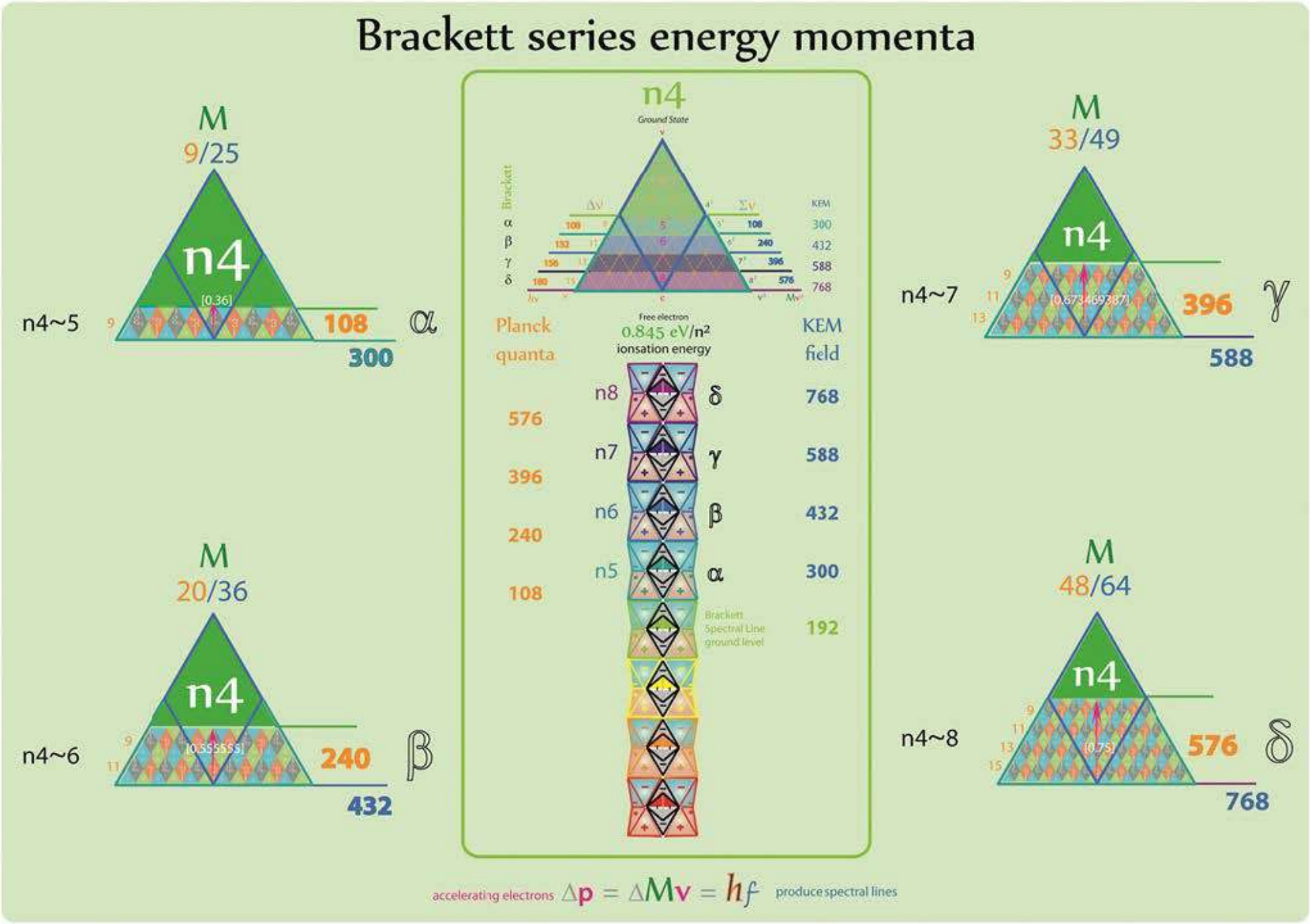
Brackett series energy momenta



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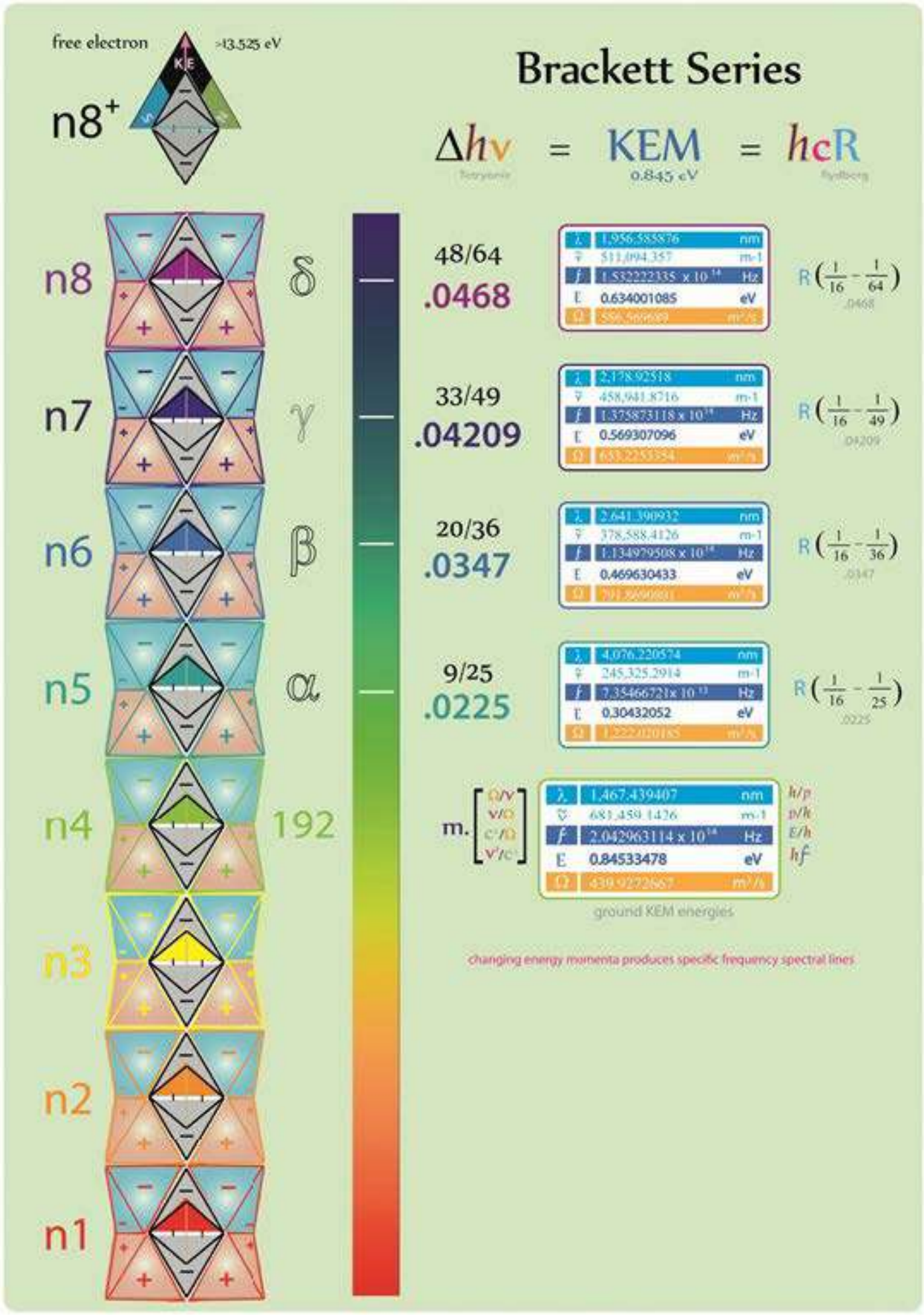

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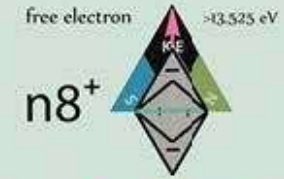
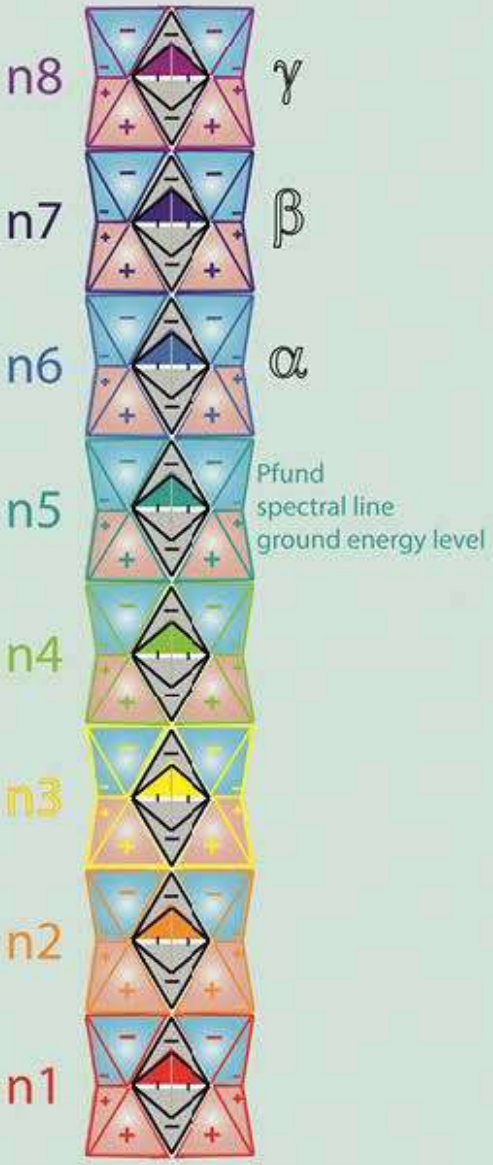
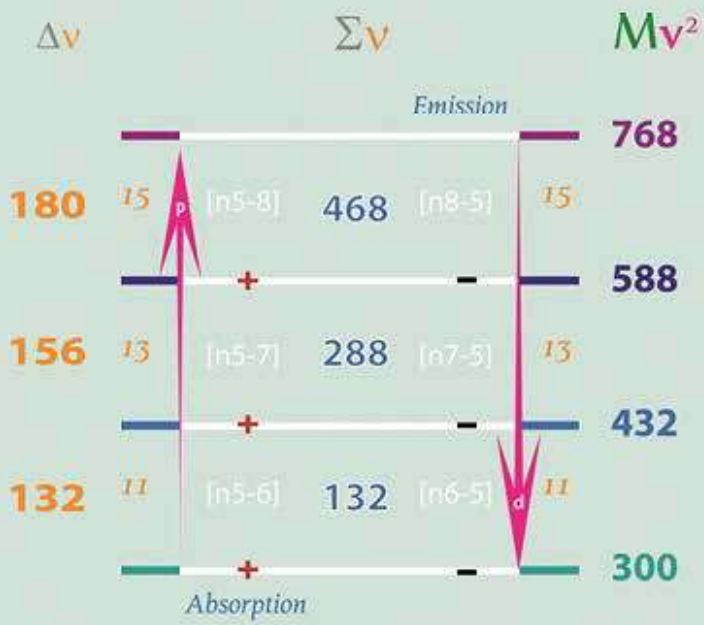
Pfund spectral lines







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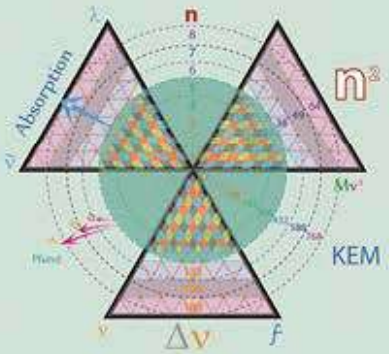
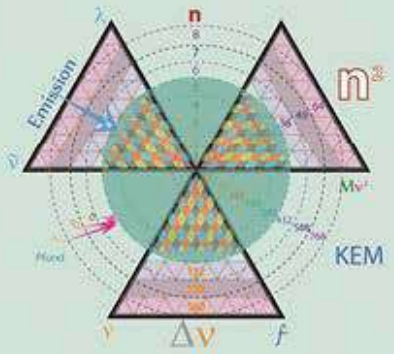
As photo-electrons transition between Mv squared KEM field energy levels in atomic nuclei they release specific [Δhν] W bosons



Pfund spectral series

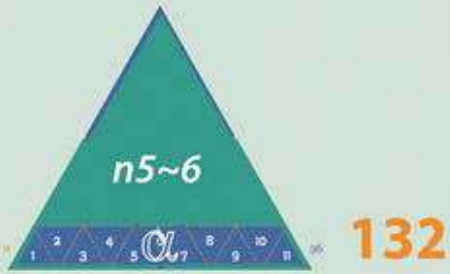
α	7,503	n5-6
β	4,681	n5-7
γ	3,762	n5-8

IR spectrum



O shell

$$\frac{\Delta\nu}{KEM}$$



132

432

1 quantum level jump

288

588

2 quantum level jump

468

768

3 quantum level jump

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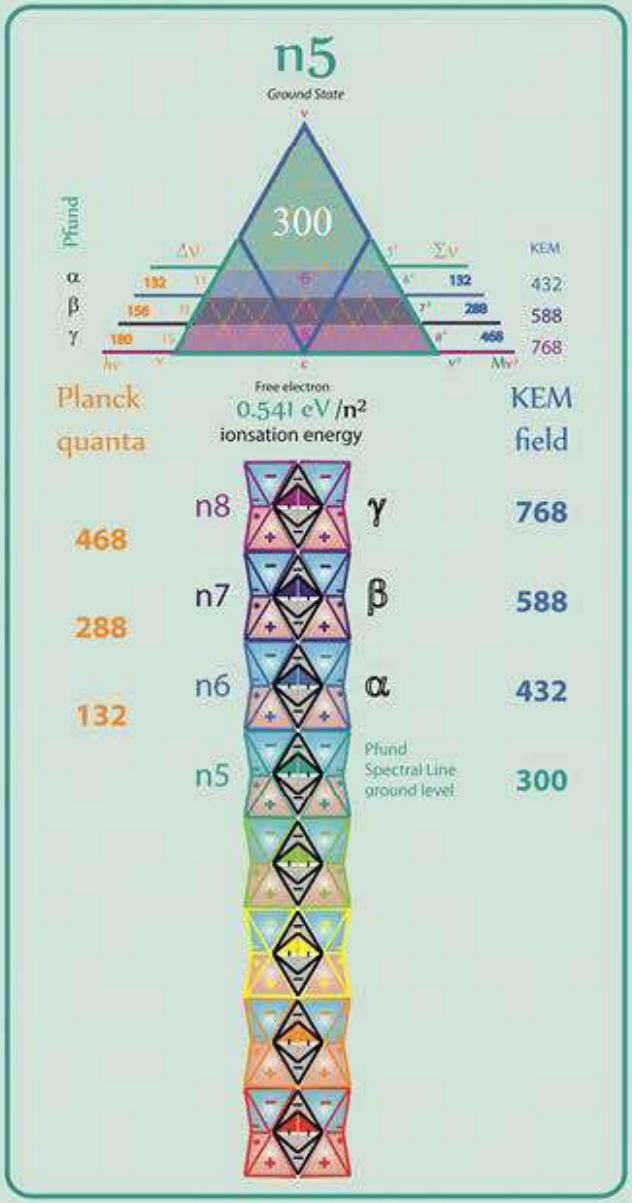
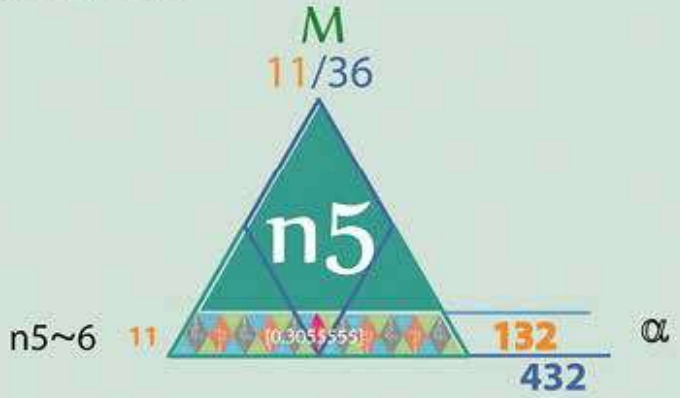
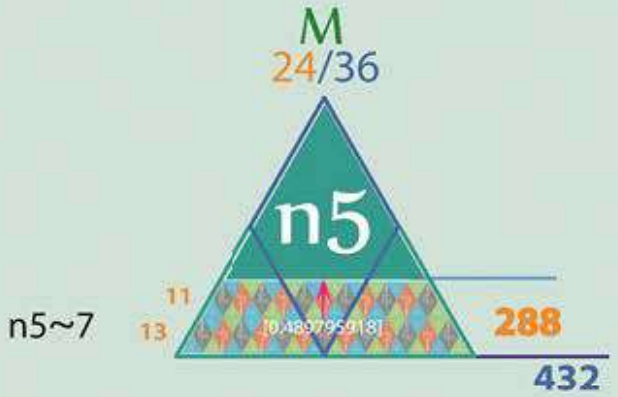
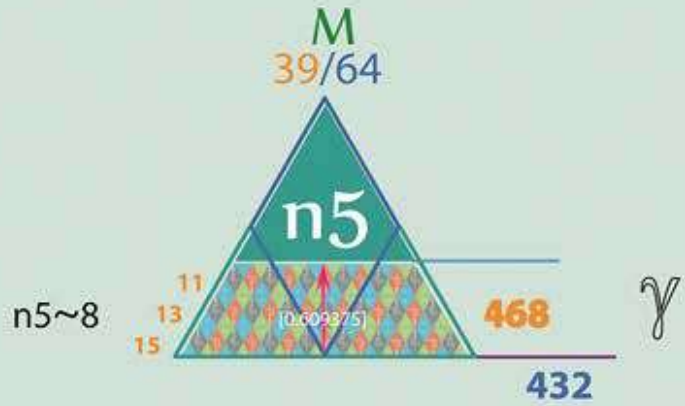
Pfund series energy momenta









accelerating electrons $\Delta p = \Delta M v = hf$ produce spectral lines

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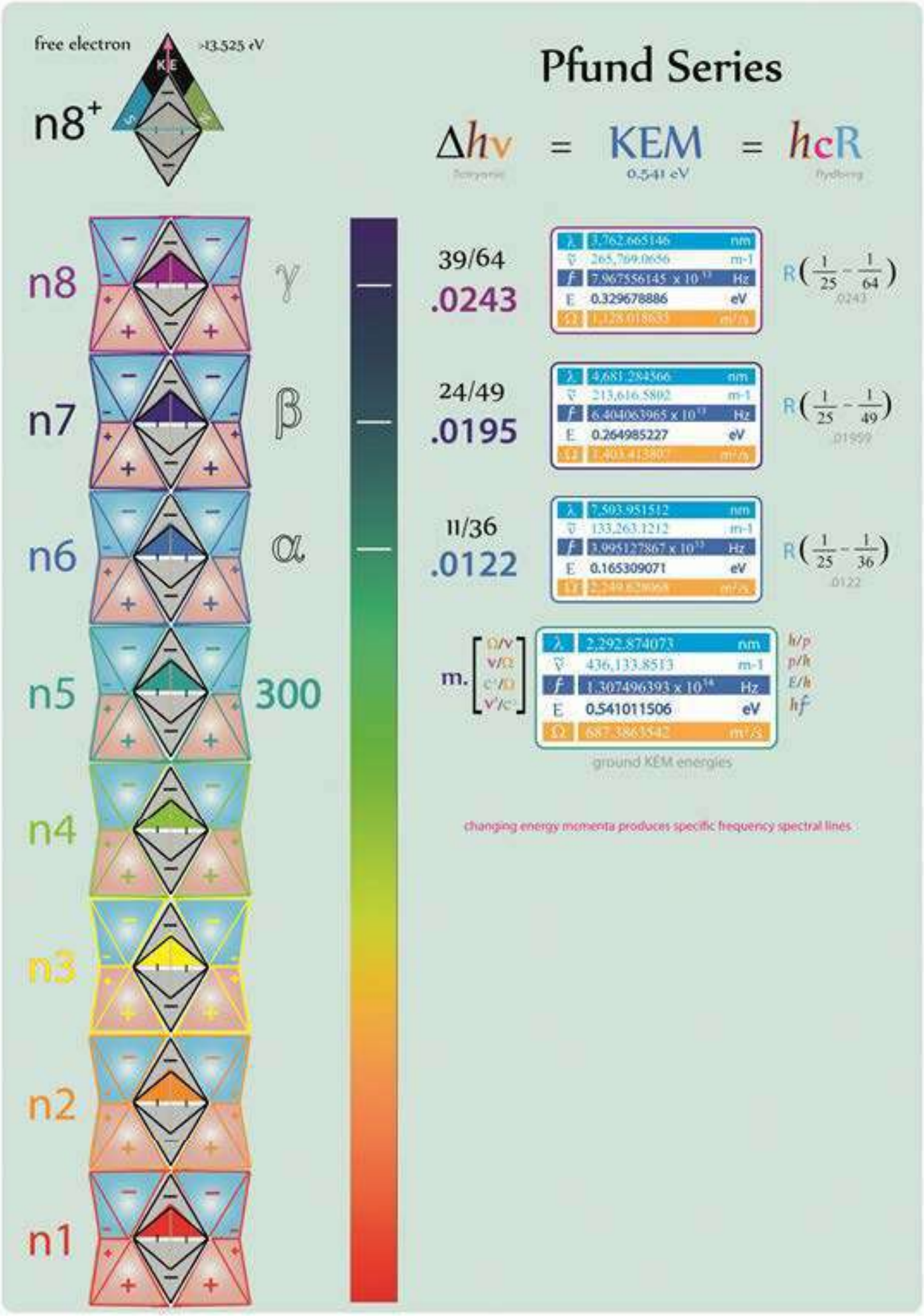

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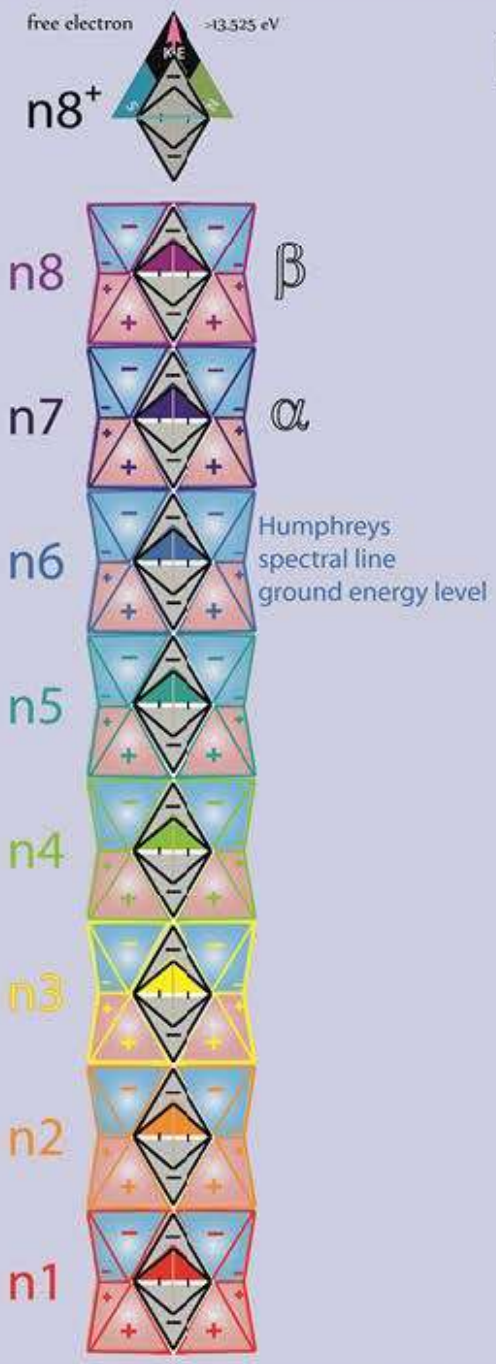
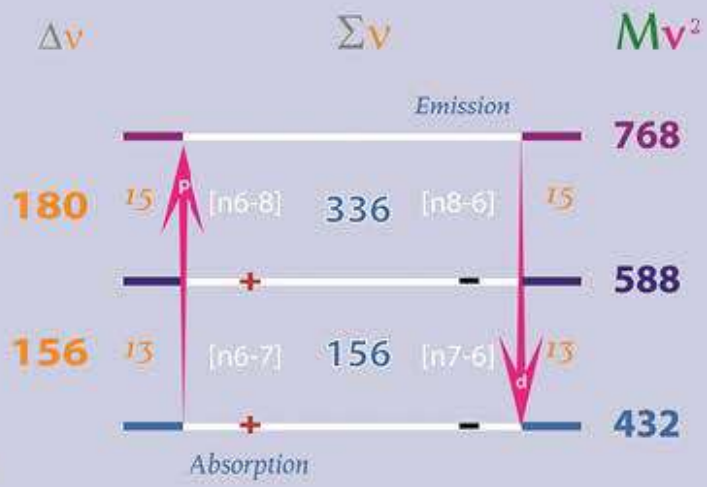
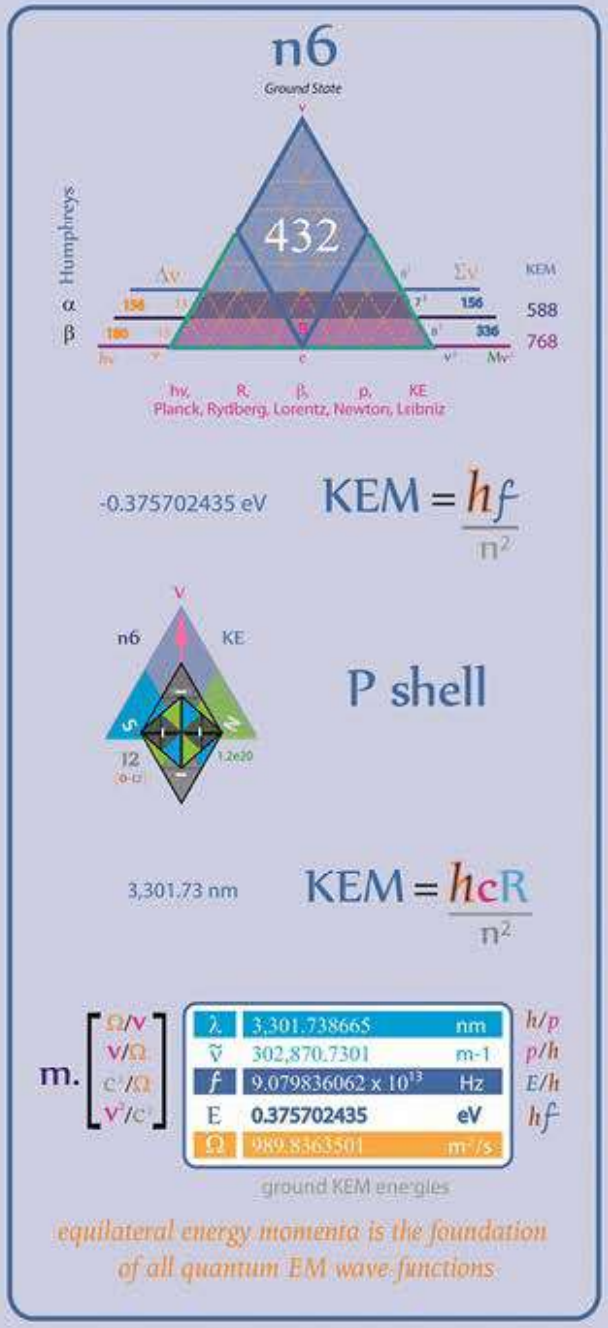
Humphreys spectral lines







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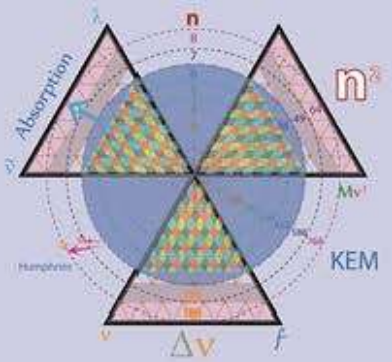
As photo-electrons transition between Mv squared KEM field energy levels in atomic nuclei they release specific [Δhν] W bosons

-0.375702435 eV

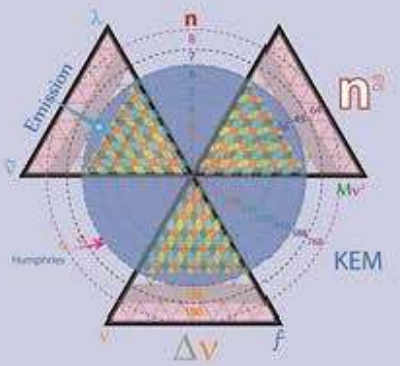
3,301.73 nm



Humphries spectral series

α	12,445	n6-7
β	7,546	n6-8

IR spectrum



P shell

$$\frac{\Delta\nu}{KEM}$$

156

588

1 quantum level jump

336

768

2 quantum level jump

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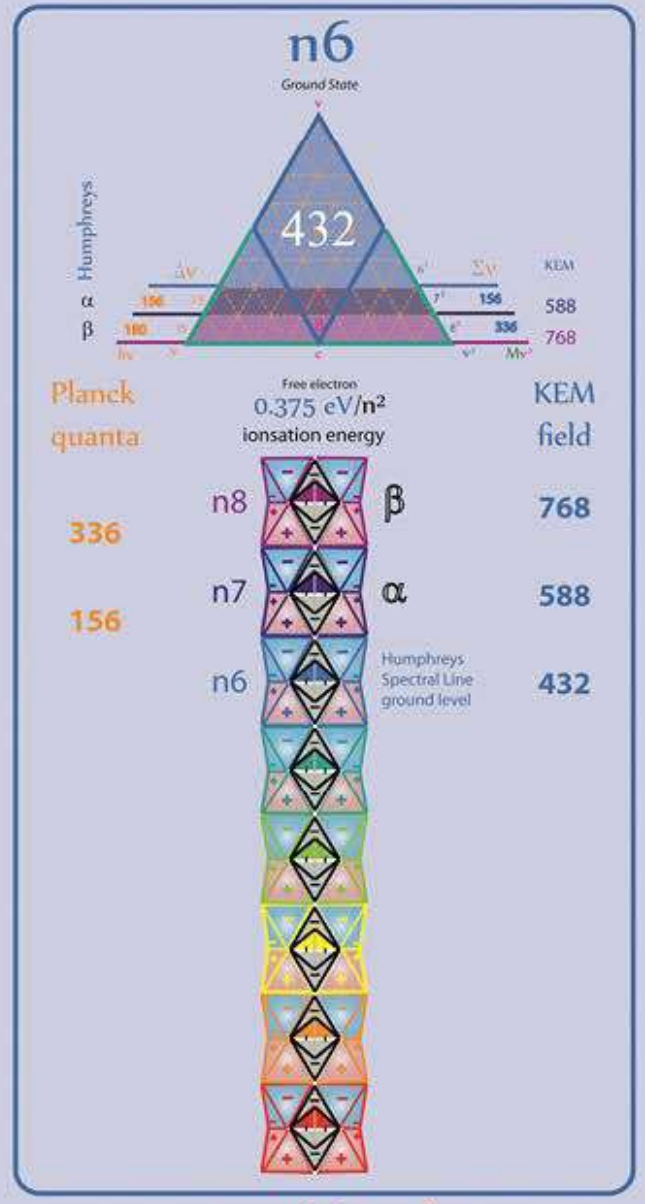
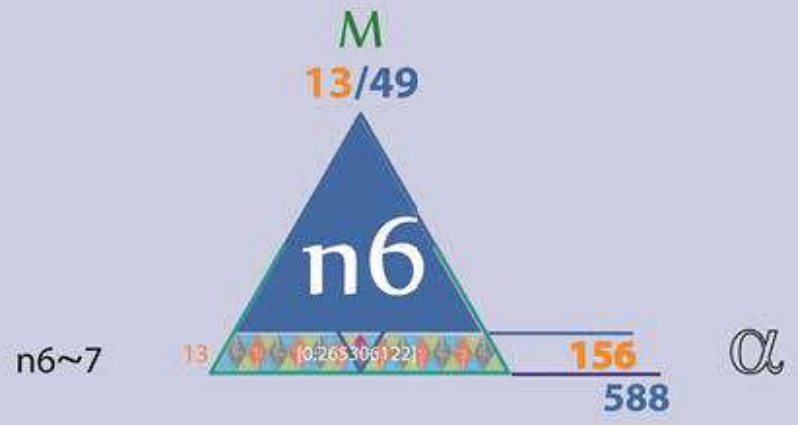
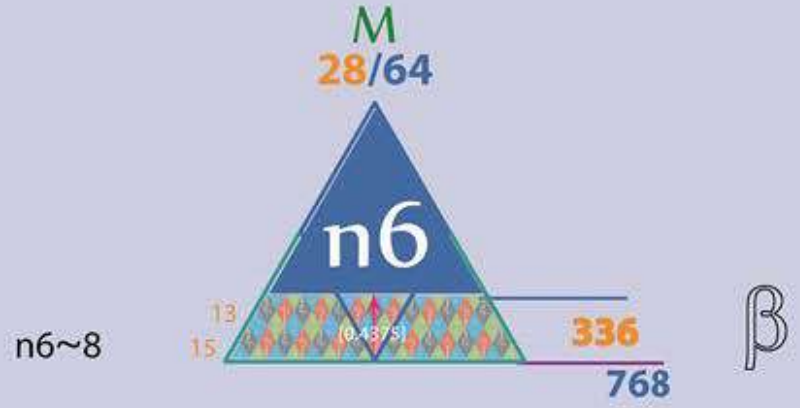
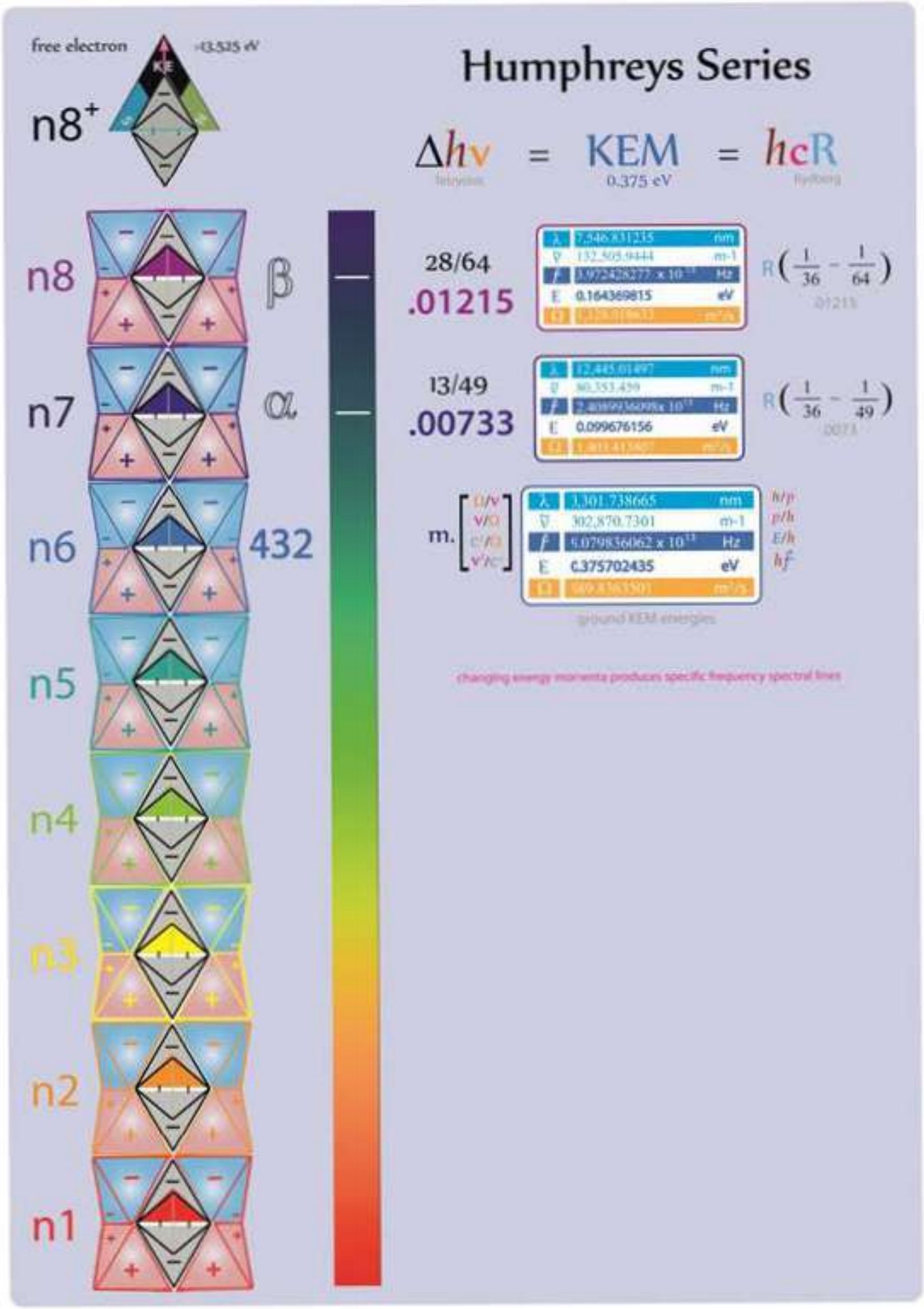
Humphreys series energy momenta







accelerating electrons $\Delta p = \Delta M v = hf$ produce spectral lines



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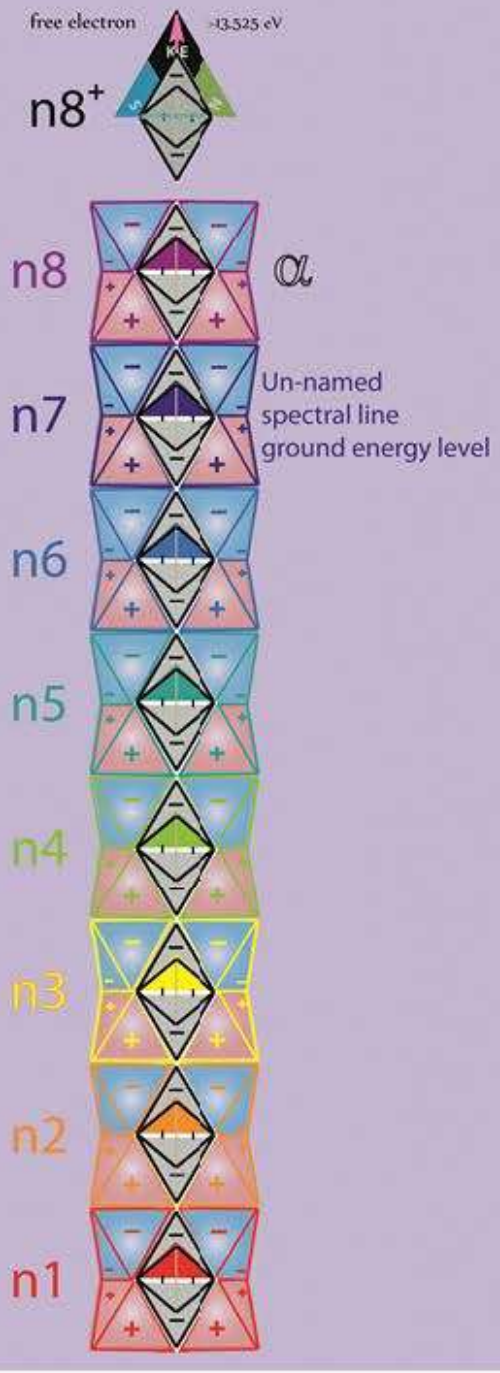
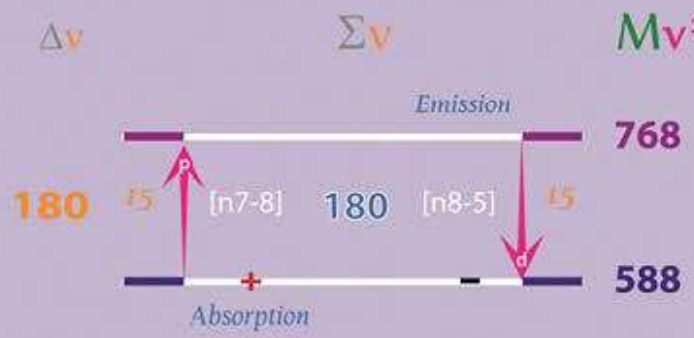
Un-named spectral line





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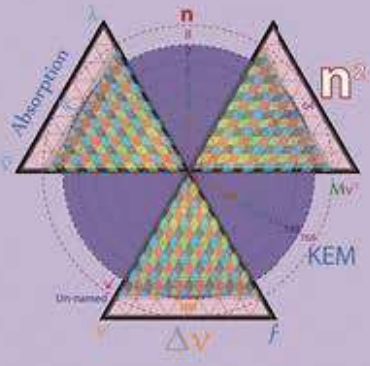
*This spectral line photo electrons transition can only release **one** specific [ΔMv] W boson of energy*

-0.276026782 eV

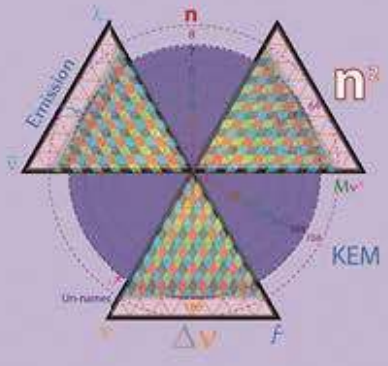
4,494.03 nm



Un-named spectral series

α **19,174** n1-8

IR spectrum



Q shell

$\frac{\Delta V}{KEM}$

1 quantum level jump

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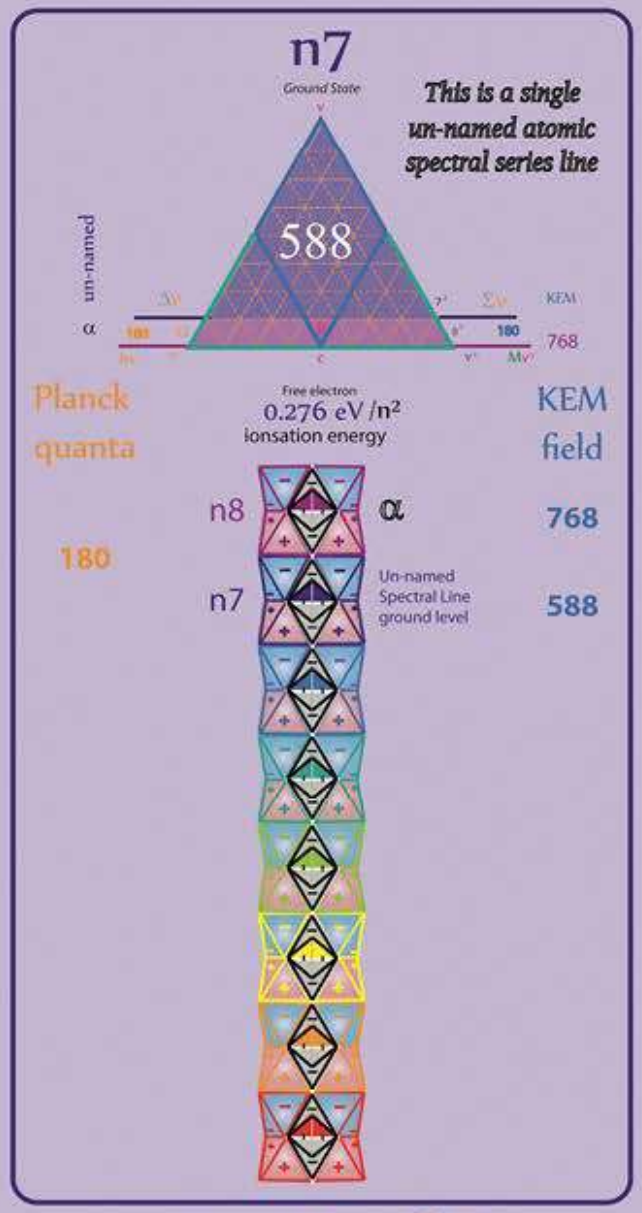
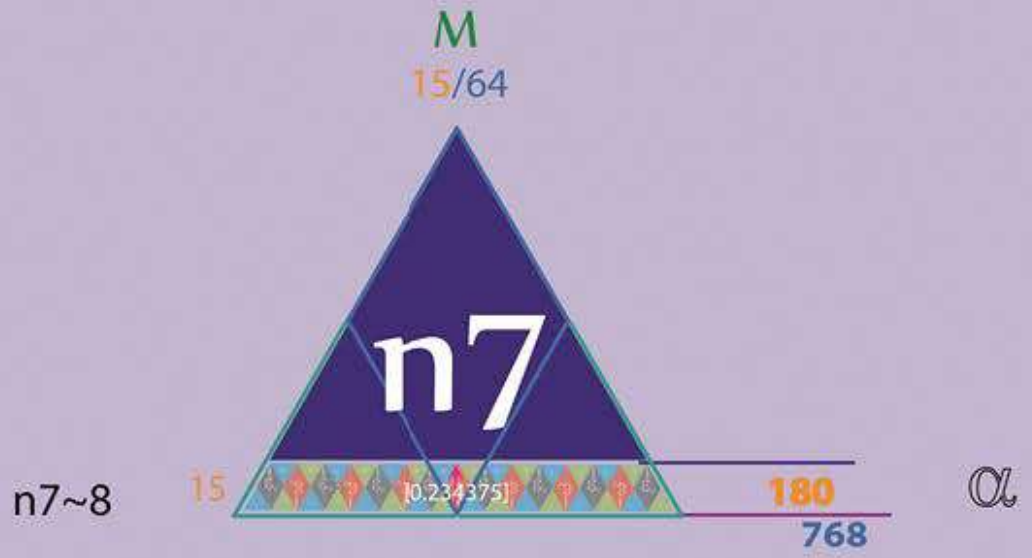
Un-named series energy momenta





accelerating electrons $\Delta p = \Delta Mv = hf$ produce spectral lines

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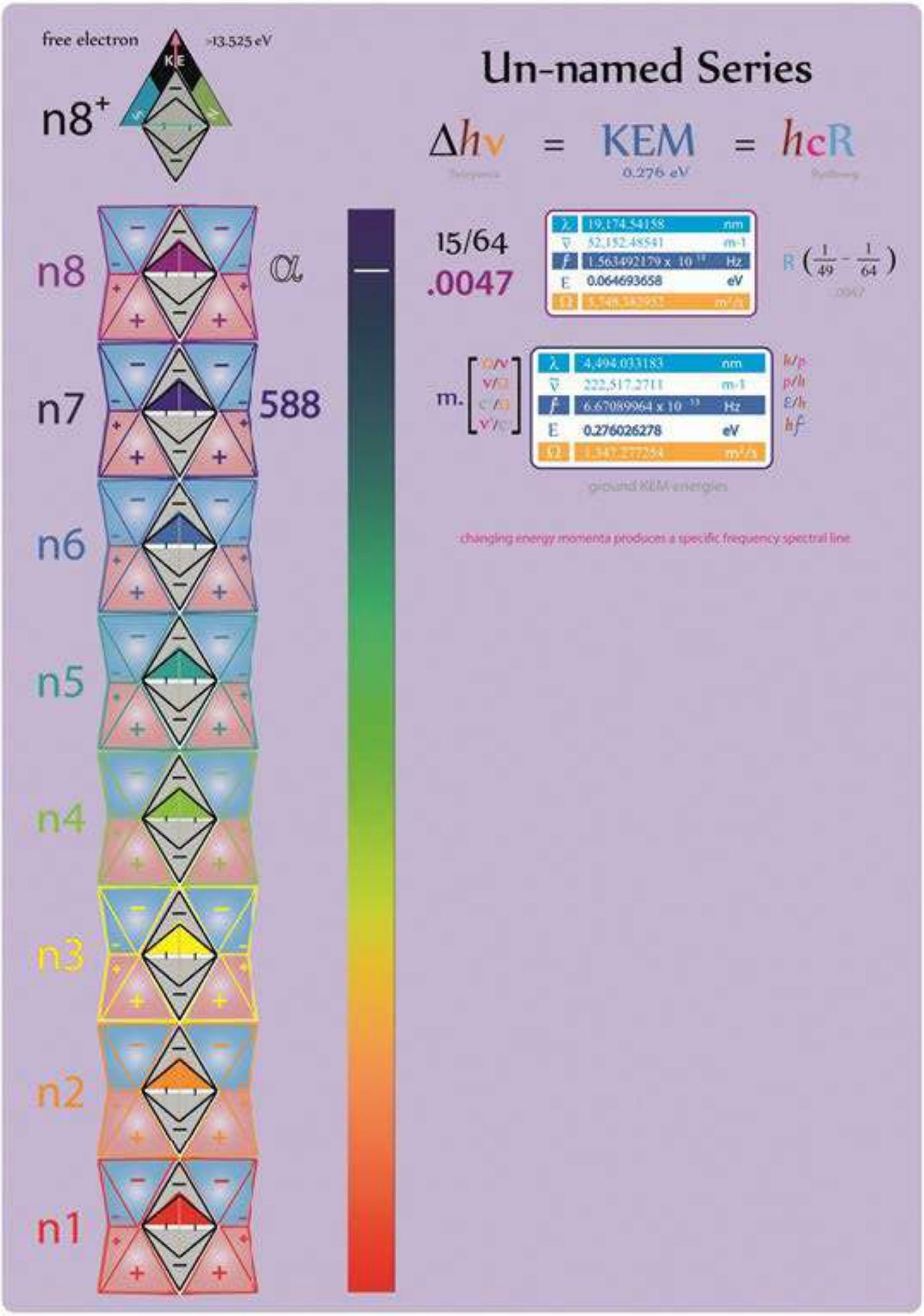

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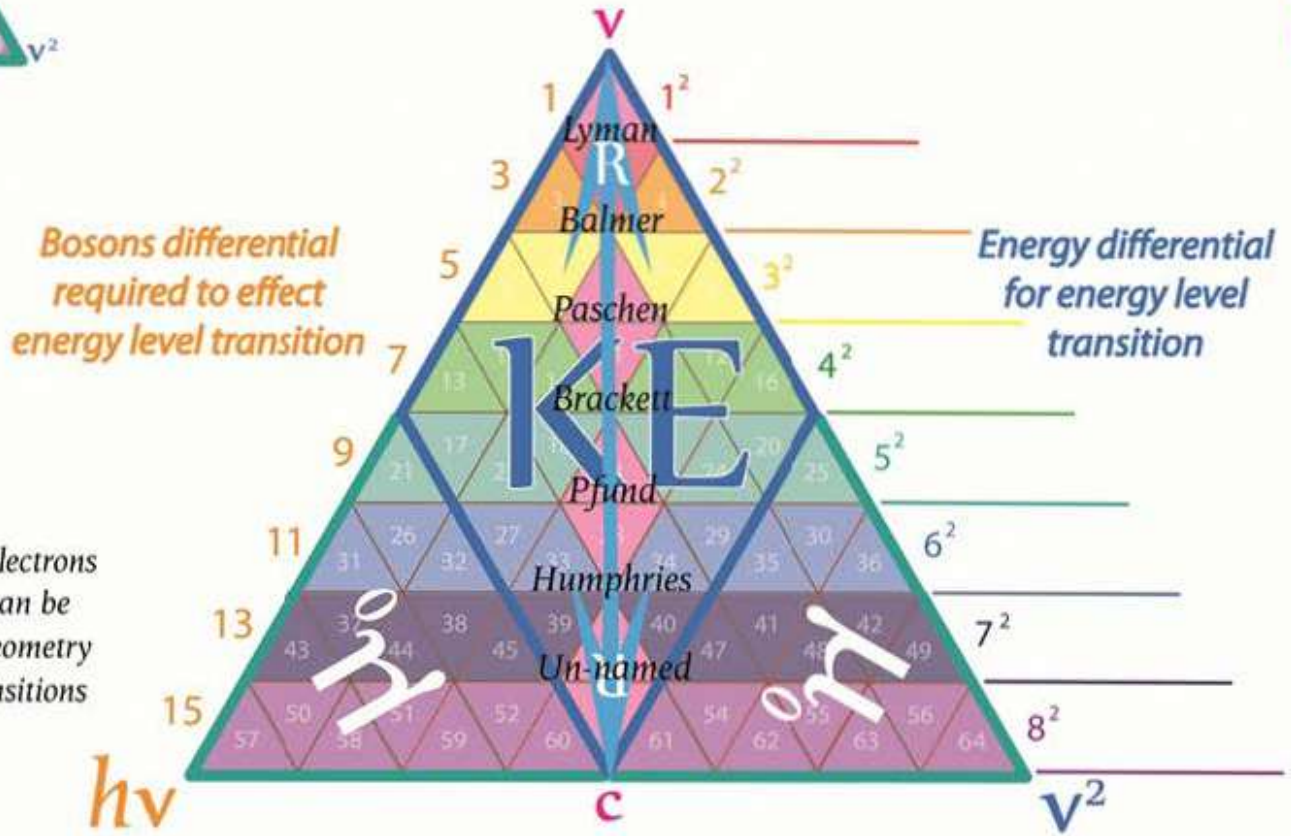
KEM field geometry

The Lorentz corrected velocity of electron resulting from atomic energy level transitions



Bosons differential required to effect energy level transition

Energy differential for energy level transition

All of the quantum jumps of electrons bound in a Hydrogen atom can be summerised in the Tetryonic geometry reflecting the energy level transitions

Ryberg's constant is reflective of the wavelengths and linear momentum of a transitioning electron's KEM field

Ryberg's formula is a mathematical description of Tetryonic energy geometry

$$Mv^2 = KEM = hcR_H$$

KEM field quanta

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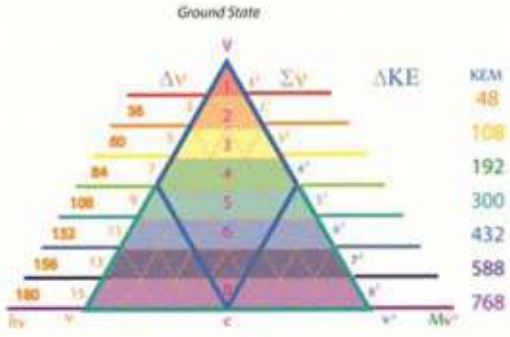
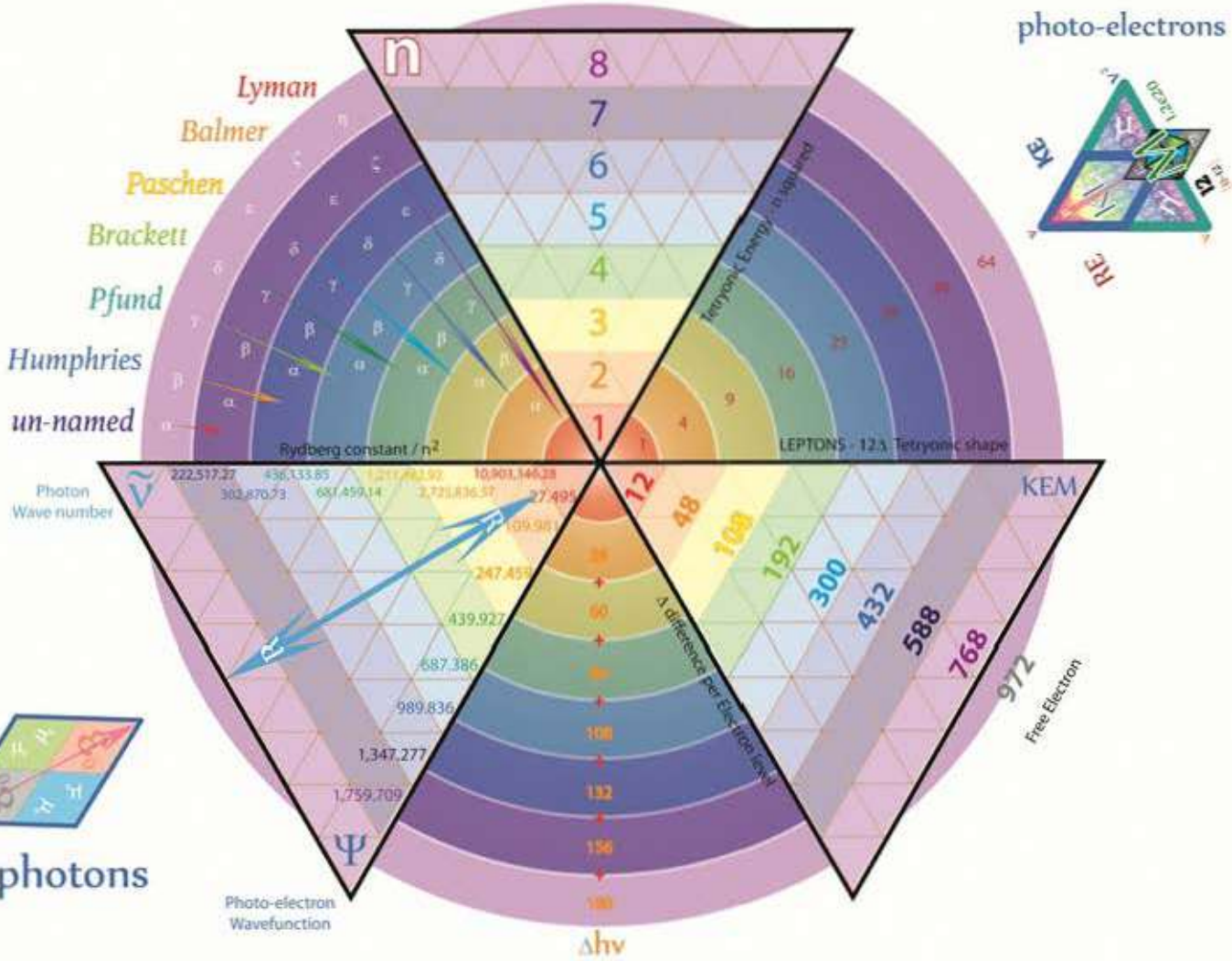
Photoelectron transitions

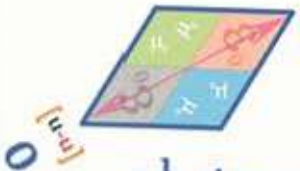


Spectral Lines

Nuclear Quantum Levels

The kinetic energy levels of bound nuclear photon-electrons is determined by the energy levels of their Baryons





Spectral lines are produced by

The energy and wavelength of emitted photons is a function of the photo-electron's KEM field quantum wavenumber

Quantum Transitions

$$hf = \Delta Mv = \Delta p$$

27.49545

accelerating photo-electrons

Changes to the energy momenta of KEM fields produce changes to the linear momenta of photo-electrons

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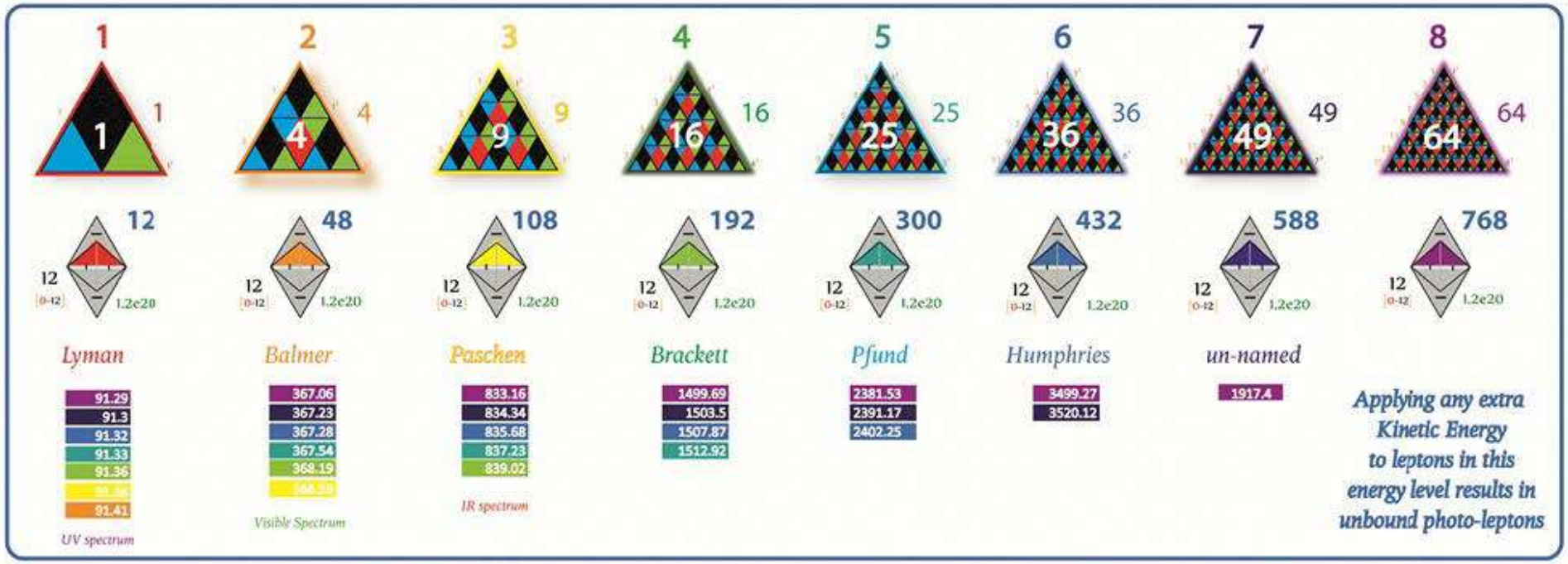
Photoelectric energy level transitions



$$Mv^2 = KEM = hcR_H$$

These specific quantum level steps create the Photoelectric effect

$$\Delta hv = \phi = hf$$

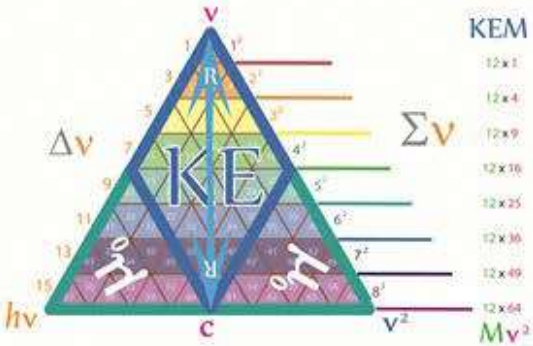


Photo-electrons bound to atomic nuclei can only transition between Mv squared KEM energies as a direct result of the energy levels of Baryons

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The Photoelectric effect

The photoelectric effect was first observed in 1887 by Heinrich Hertz (1857-1894) during experiments with a spark-gap generator — the earliest form of radio receiver

$E_\gamma = hf$

There are specific frequencies of light that are more efficient at exciting photo-electrons from atoms

$p^2 = KEM = Mv^2$

The energies of the emitted electrons are independent of the intensity of the incident radiation but are dependent on the photon frequency

n2-4 specific transitions can release
8 times the number of electrons
that n3-4 can release &
4 times the number of electrons
that n1-4 can release

Photoelectrons with higher Kinetic energy ejected

Minimal energy Photoelectrons ejected

No Photoelectrons ejected

Any photon with EM energies in excess of a specific frequency produces a 'free' electron with higher Kinetic energies and linear momentum

n3 M 1

n2 L 8

n1 K 2

Soon after the discovery of Planck's Heat law and the quantisation of energy at the quantum level experiments by others, most notably Robert Millikan (1865-1953), found that light with frequencies below a certain cutoff value, called the threshold frequency, ould not eject photoelectrons from the metal surface no matter how bright the source

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Photonic mass-energy momenta

Bosons

$$\text{Bosons}\ \text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

Photons

$$2\pi\ \text{Photons}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

(EM Field; Planck quanta; ElectroMagnetic; mass; velocity)

$$2m\Omega v^2 = E = n.hf$$

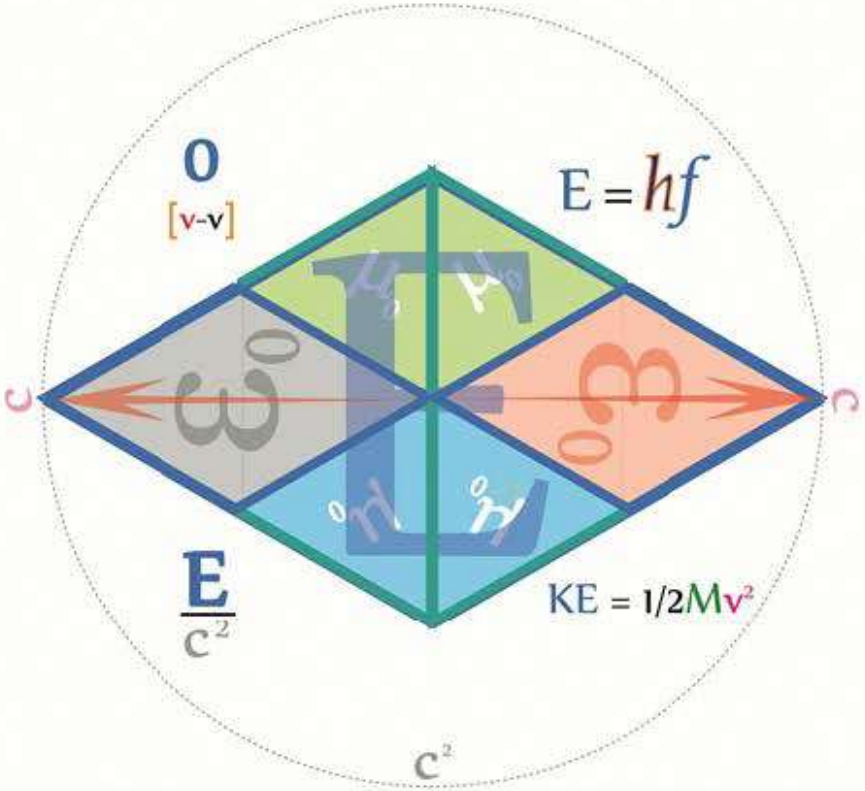
All 2D EM waveforms possess mass-energy and momenta

charged mass-energy-momentum

$$E = mv^2$$

radiant mass-energy momenta

$$E = hv^2$$



All 2D EM waveforms propagate at the speed of light

$$\text{Velocity of Light}\quad v = \left[\left[\frac{f}{\Omega}\right]\cdot\left[\frac{\lambda}{c}\right]\right] = c\quad\text{Speed of Light}$$

(scalar frequency; linear wavelength)

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Wave~Particle duality

First proposed by Christian Huygens in the 1600's, it wasn't until the 1800's that Thomas Young proved this wave-particle duality with the classic double-slit experiment.

Sir Isaac Newton

(1643-1727)

Particles

In 1678, Dutch physicist, Christiaan Huygens, believed that light was made up of waves vibrating up and down perpendicular to the direction of the light travels, and therefore formulated a way of visualising wave propagation.

This became known as 'Huygens' Principle' and was the successful theory of light wave motion in three dimensions

Sir Isaac Newton, held the theory based on his spetral observations that light was made up of tiny particles or 'corpusles of colour'

English physicist Thomas Young argued that Isaac Newton's theory of particle light was incorrect, and instead argued that light is a transverse wave.

In 1803, Thomas Young studied the interference of light waves by shining light through a screen with two slits equally separated, the light emerging from the two slits, spread out and produced wave-like interference patterns.

Waves

Thomas Young

(1773-1829)

In 1900

Max Planck proposed the existence of a light quantum, [n.hv] a finite packet of energy which depends on the frequency and spectral energy of the radiation

Light - a Wave, or a Particle?

In 1905

Albert Einstein, suggested that light is composed of tiny particles called photons, and that each photon has energy related to its frequency [hf].

Max Karl Ernst Ludwig Planck

(April 23, 1858 – October 4, 1947)

Bosons

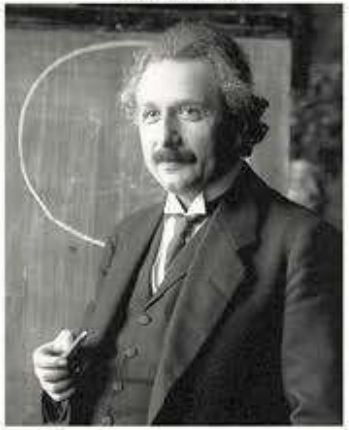
$$nhv = E = hf$$

Mathematically directly relating the number of Planck quanta [n.hv] with Photon frequencies [hf] and the frequent interchanging of one term for the other in physics is the source of considerable quantum confusion

$$2hv = hf$$

Photons

Albert Einstein



(14 March 1879 – 18 April 1955)

The quantum idea was soon seized upon to explain the photoelectric effect, and became part of the Bohr theory of discrete atomic spectra, quickly becoming part of the foundation of modern quantum theory in turn this led to the quantum wierdness of wave-particle duality, Heisenberg's Uncertainty principle and Schrodinger's quantum wave equation & wavefunctions.

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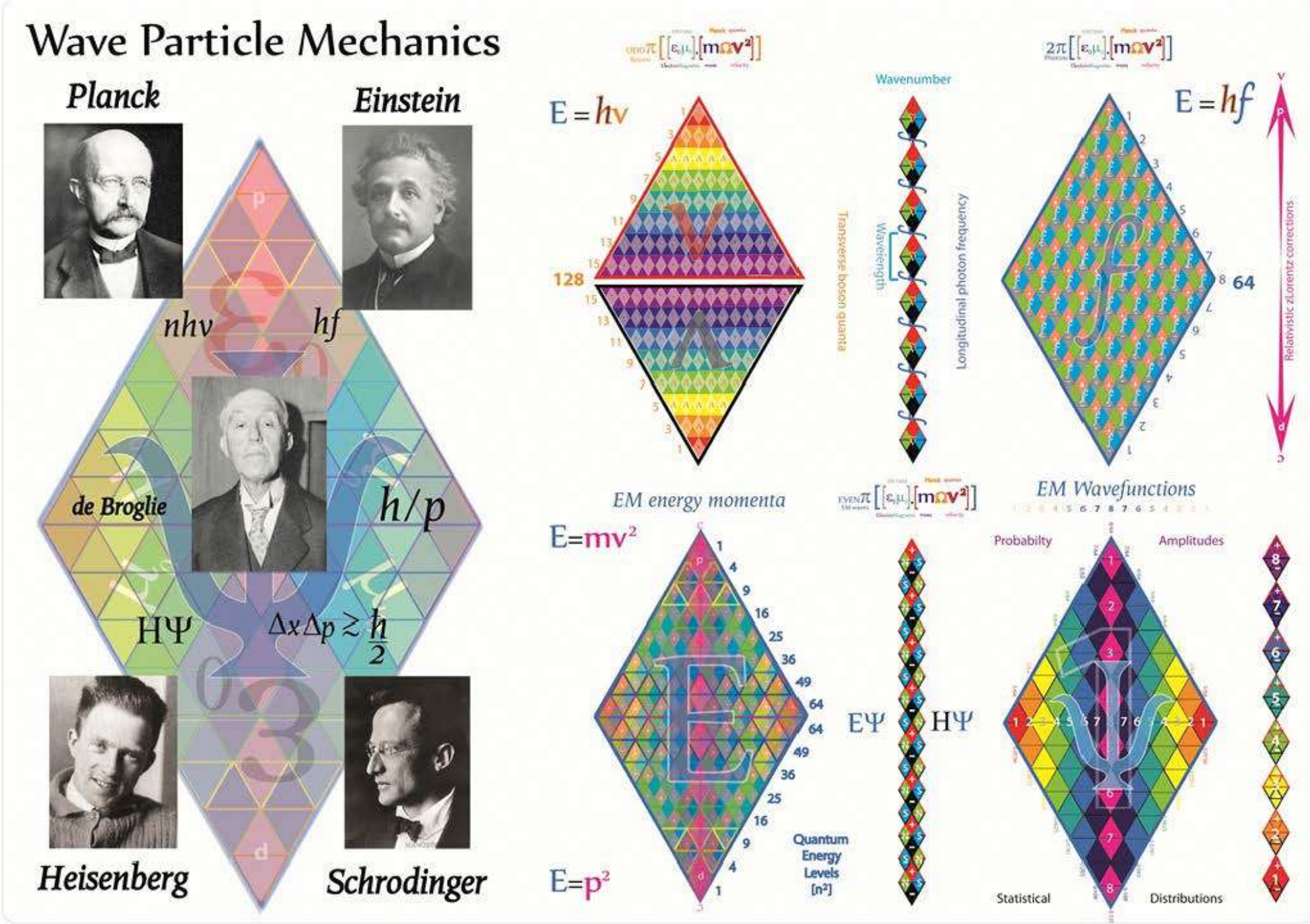

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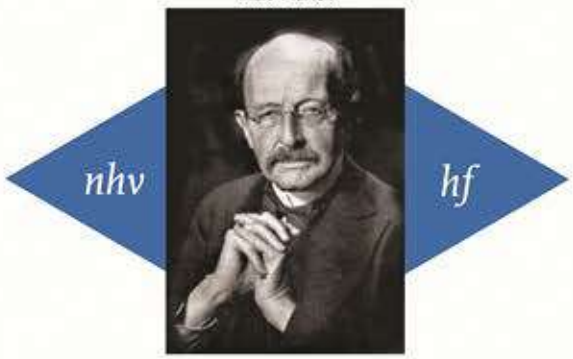
Blackbody Radiation

Wien's displacement law

Rayleigh–Jeans law

Max Planck

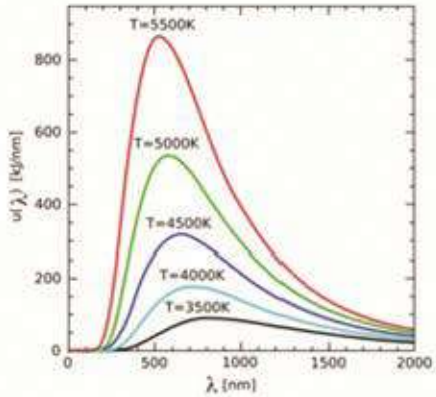


(April 23, 1858 – October 4, 1947)

In physics, Planck's law describes the amount of electromagnetic energy with a certain wavelength radiated by a black body in thermal equilibrium (i.e. the spectral radiance of a black body).

The law is named after Max Planck, who originally proposed it in 1900. The law was the first to accurately describe black body radiation, and resolved the ultraviolet catastrophe by introducing Planck's Constant.

It is a pioneer result of modern physics and quantum theory leading to mass.QAM being termed Planck's constant.

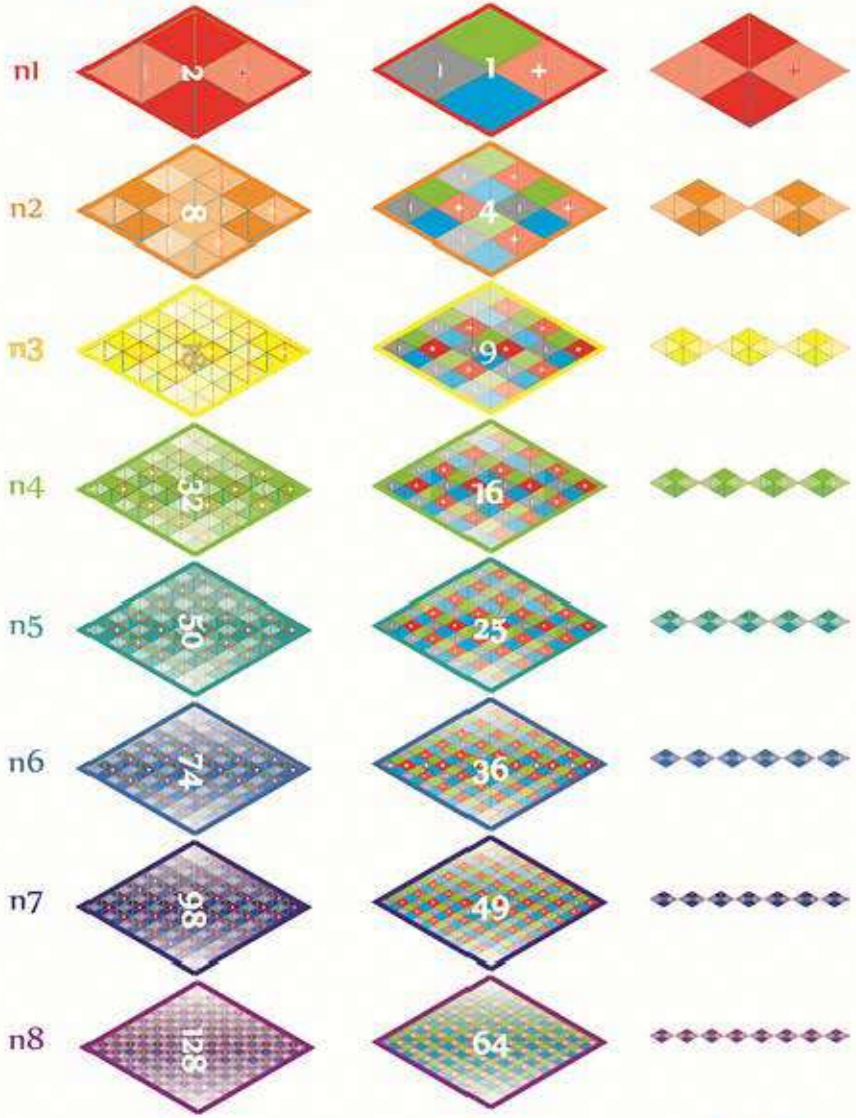


$m\Omega = 6.62943244\ e\text{-}34\ ].s = h$

nhν

All EM waves are comprised of discrete energy quanta

As their frequency increases the wavelength of emitted Photons decreases



$2h\nu = hf = hc\tilde{\nu}$

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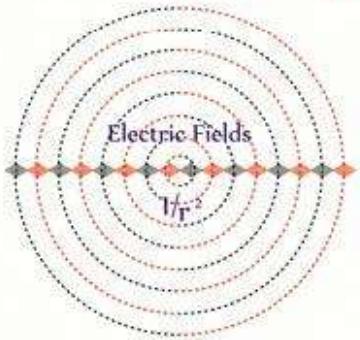
EM field energies

$$E = n\pi\left[\left[m\Omega v^2\right]\right]$$ (Planck quanta; mass; velocity)

2hv

All quantum energy waveforms are geometrically coupled Electric and Magnetic fields that produce time-varying electro-magnetic fields

hf



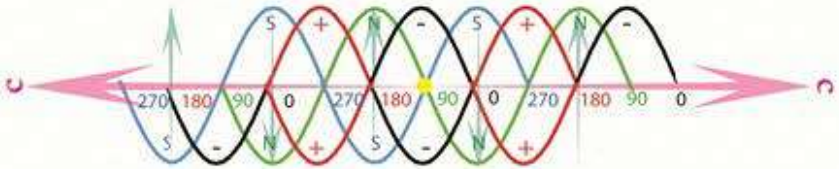
8 hv

4 hf

$$1\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$ (Charge; EM Field; ElectroMagnetic; mass; Planck quanta; velocity)

$$E = hv$$

EM waves are subject to Lorentz co-ordinate transformations



EM waves are a quadrature waveform of bi-directional electromagnetic oscillations

$$E = hf$$

$$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$ (Photons; EM Field; ElectroMagnetic; mass; Planck quanta; velocity)

32 hv

16 hf

$$\text{EVEN}\,\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$ (EVEN EM waves; EM Field; ElectroMagnetic; Planck quanta; mass; velocity)

128 hv

64 hf

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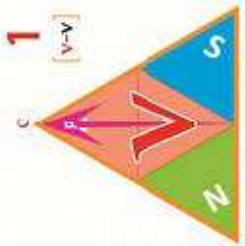
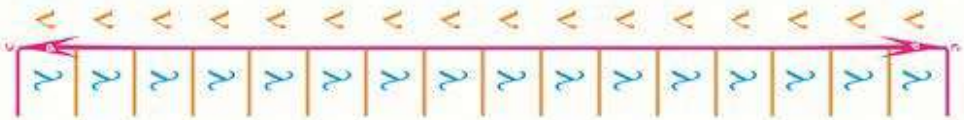
Bosons and Photons in EM waves

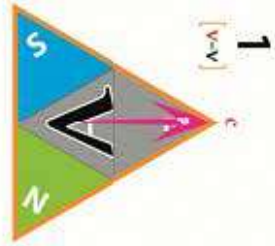


$$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta · Bosons · ElectroMagnetic mass · velocity

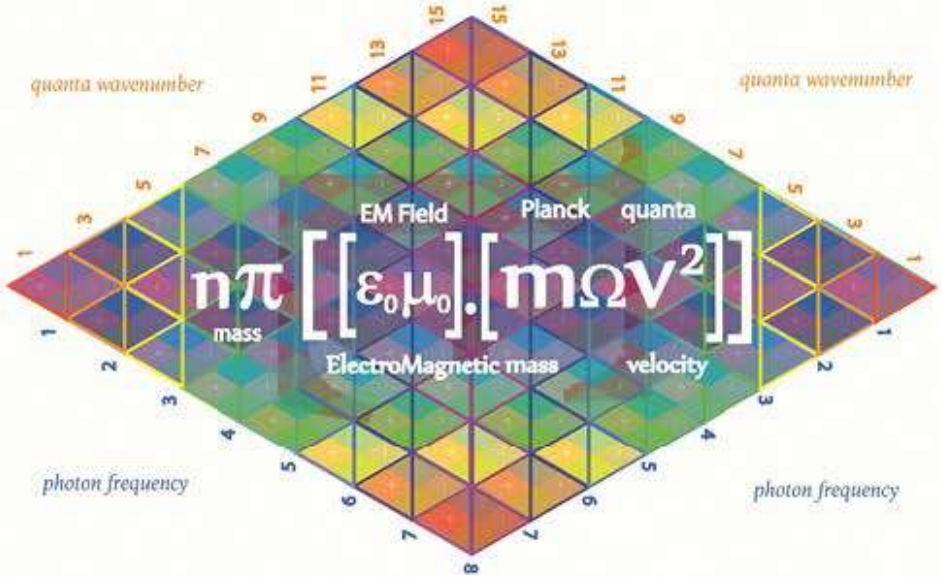
Transverse charge Quanta





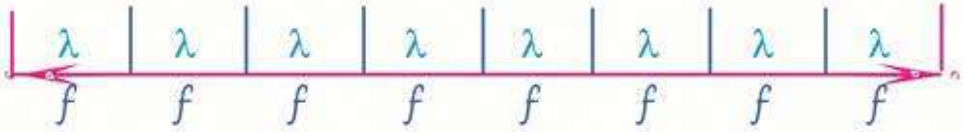
All EM waves are comprised of transverse Bosons

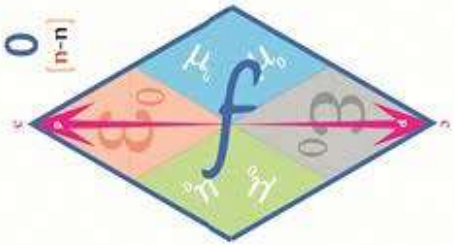
$E = h\nu$



$E = hf$

All EM waves are comprised of longitudinal Photons





Longitudinal neutral Photons

$$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field · Planck quanta · Photons · ElectroMagnetic mass · velocity

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EM wave energy quanta

All EM waves are composed of Bosons

Tranverse Bosons in EM wave energies should be modelled using [n] Planck quanta

Wavefunction

$$i\hbar\frac{\partial}{\partial t}\Psi \quad \Psi \quad \hat{H}\Psi$$

Probability = |Amplitude|²

The Longitudinal EM wave energies should be modelled using [f] Photon frequencies

Transverse neutral W Boson quanta [v]

Bosons and Photons with the same energies have different wavelengths

Longitudinal Photon frequency [f]

$$E = n\pi\left[m\Omega v^2\right]$$

Planck quanta: mass, velocity

All Wave~Particle geometries and mass-energies can be calculated from and modelled with the Tetryonic Unified Field Equation

$$E = hf$$

Photon

$$\text{EVEN}\,\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field; Planck quanta; EVEN EM waves; ElectroMagnetic; mass; velocity

All EM waves are composed of Square number Photons

Probability = |Amplitude|²

$|4|^2 = 16$

Probability = |Amplitude|²

$|8|^2 = 64$

$$\text{ODD}\,\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

Bosons; EM Field; ElectroMagnetic; mass; velocity; Planck quanta

$E = n.hn$ Boson

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EM wave properties

Linear momentum is the square root of scalar mass-energies

$$\left[\sqrt{[m\Omega v^2]}\right]$$

EM waves are comprised of Photons with Kinetic energies, momenta and a photo-magnetic moment

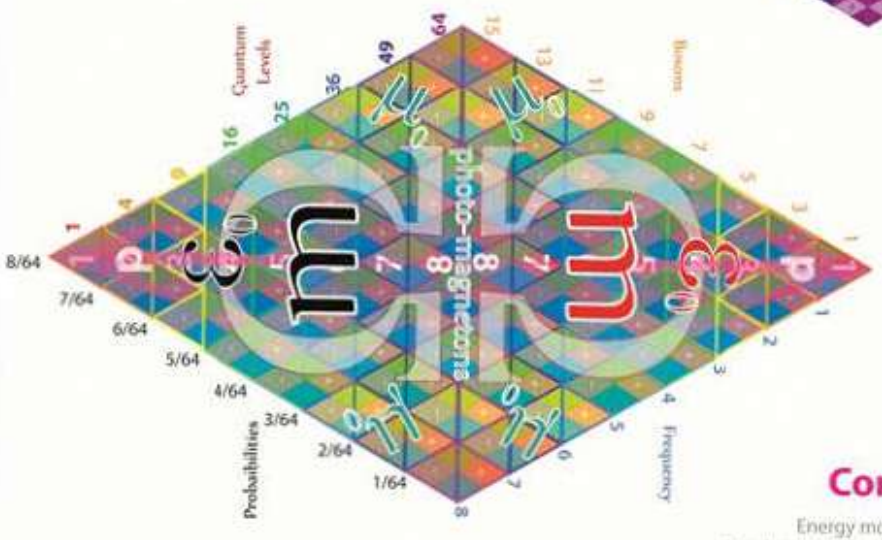
EM waveform geometries

$$p_\gamma = 2\pi\left[\left[m\Omega v\right]\right]$$

Photonic energy-momentum

Transverse waveforms

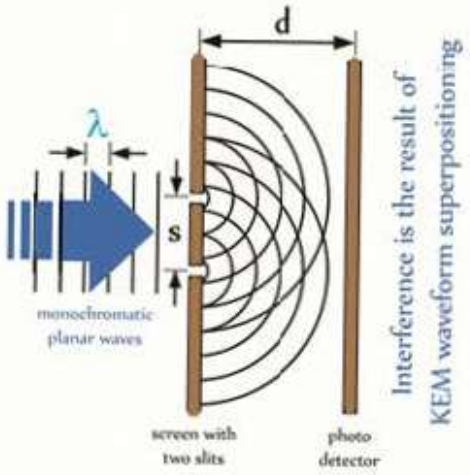
Longitudinal waveforms



Ωm

Scalar Planck quanta per second is the scalar source of all linear energy-momenta

p^2



Conservation of Energy momenta

Energy momenta a conserved quantity in physical systems (laws of conservation), meaning that if a closed system is not affected by external forces, its total momentum cannot change

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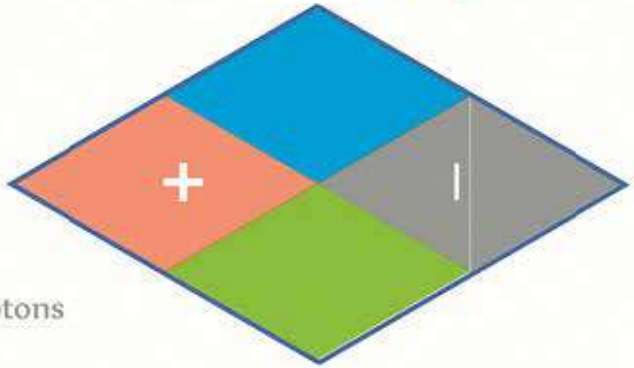
Statistical probabilities of energy distributions

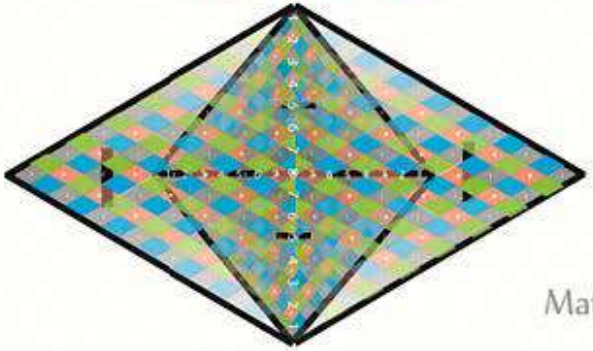
form the basis for quantum mechanical probabilities and wavefunctions

$E = 2mv$



Photons

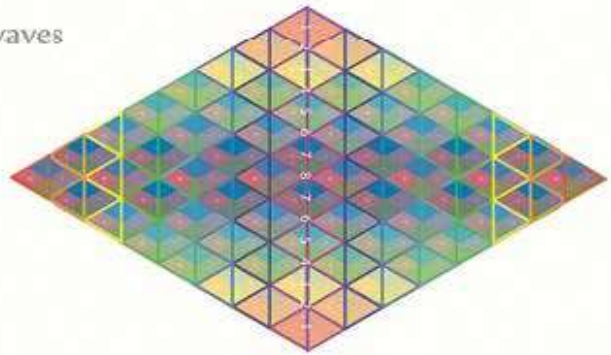
$E = Mc^4$



Matter

All ENERGY in motion has probabilistic distribtutions of energy quanta resulting from the equilateral Tetryonic geometries of electromagnetic mass-ENERGY-Matter

EM waves



$p^2 = E = mv^2$

Kinetic Energies

$KE = \frac{1}{2}Mv^2$

KEM fields

$Mv^2 = KEM$

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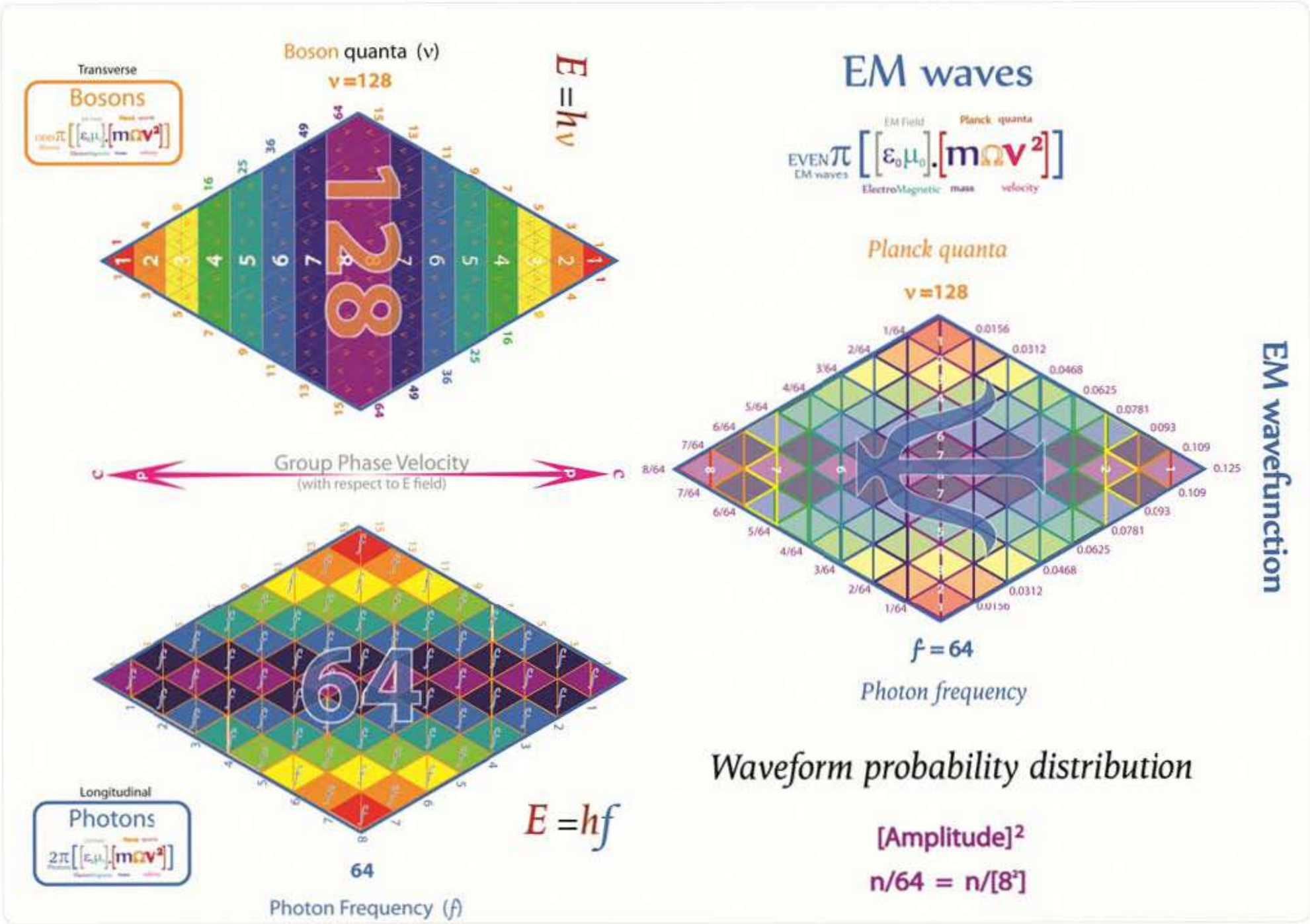

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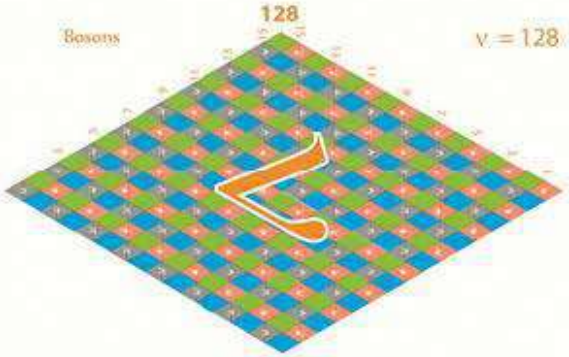
Wave functions

All EM waves and Photons exhibit quantum levels of mass-energy momenta determined by their constituent bosons

Transverse EM Waveforms

Bosons



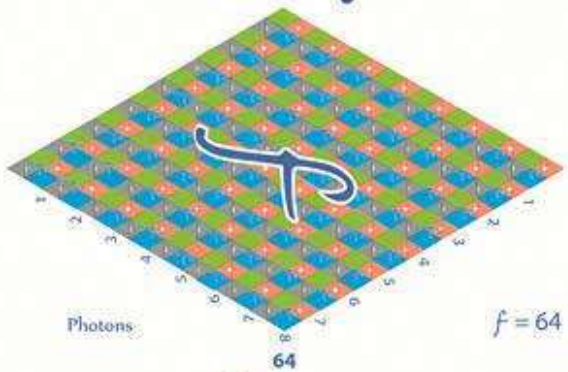
$E = h\nu$

[Planck quanta are single-quanta Bosons]

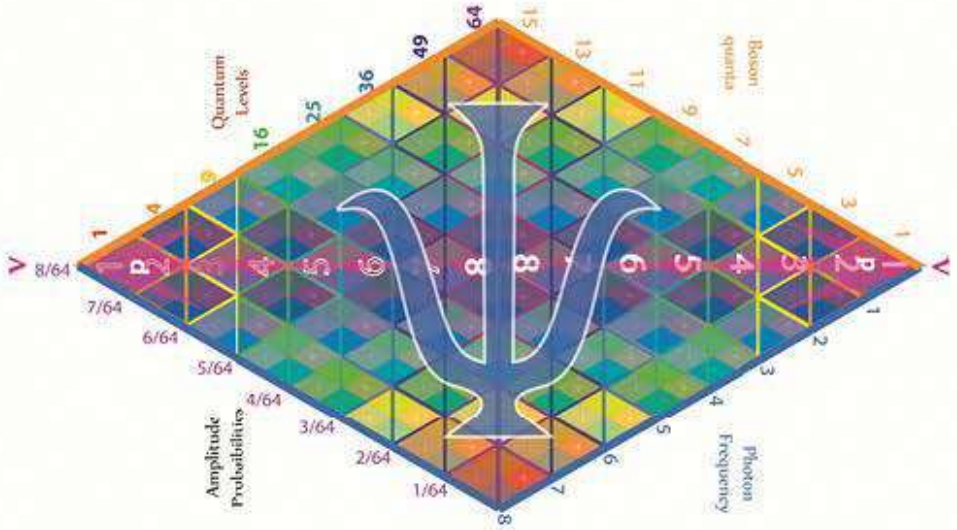
All EM waves are comprised of Longitudinal Photons which in turn are made up of Transverse Bosons

[Photons are neutral dual-quanta Bosons]

$E = hf$



Photons



Longitudinal EM waveforms

All electromagnetic waves exhibit wave probabilities and amplitude functions determined by their constituent photons

Energy levels

Squared numbers

Wave-particle duality holds that light and matter simultaneously exhibit properties of waves as well as particle-like properties (photons).

This concept is a consequence of the mathematical treament of mass-energy physics in quantum mechanics and a comprehensive explanation of this duality has been elusive to Physics since its discovery.

Any attmpt to develop an unified quantum theory must explain the root cause and processes behind Wave-Particle duality and must also explain:

Diffraction, Deflection and Reflection along with Bosons, Photons, EM radiation, energy quantisation and mass-Matter.

Probabilities

Waves

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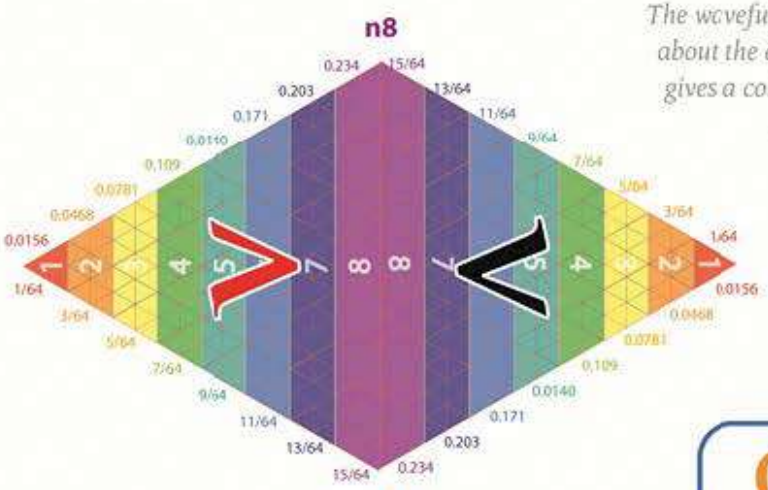
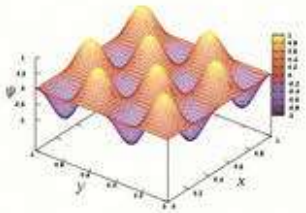
EM Wavefunctions

The wavefunction for a system contains all the information about the quantum state that a particle/system is in and gives a complete description of that part of the world at any one particular instant in time.

Transverse mass-energy distrbutions

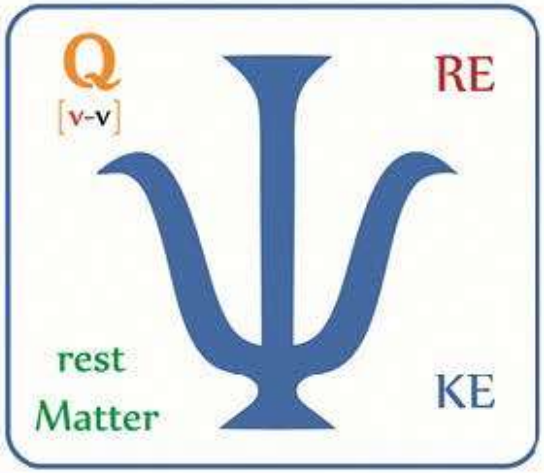


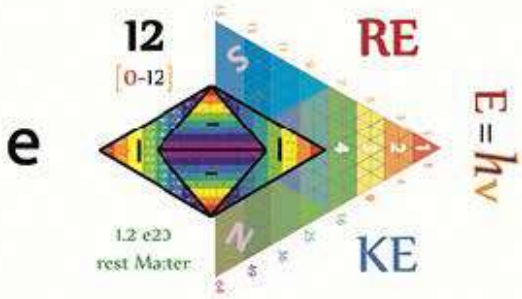
ν = 128



Longitudinal mass-energy distributions

f = 64





The wavefunction of an EM wave (KEM) geometry is distinct from that of rest mass-Matter toplogies due to the number of Planck quanta contained in it but both can be modelled using Tetryonic geometry

Quantum Energy Levels

The wavefunction itself is often said to be un-observable. In fact, it can modelled as it is a reflection of the quantas making up the quantum state of any particle and is complex-valued.

As the system evolves over time, the wavefunction also changes, so it can be written as a function of time Ψ(t)

$$\int_{-\infty}^{\infty} |\Psi|^2 \mathrm{d}x = 1.$$

The absolute square of the function must be normalizable

Wave-Particle Probabilities

The absolute square of the wavefunction is a probability density (the area of highest probability for a measurement to take place.

For example, if the wavefunction is expressed in real space and our system is a particle, the absolute square gives a probability density for the position of the system. Integrating this probability density between some bounds will give the probability that the particle will be found in that region when its position is measured

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Wave~Particle energies

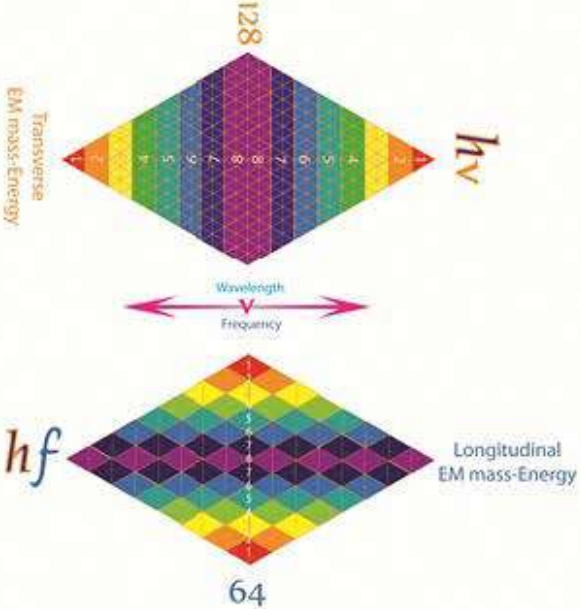
Equilateral energy is the foundational geometry
of Kinetic EM Waveforms [WAVES]
and standing wave Matter [PARTICLES]

All Matter in motion exhibits a Wave-Particle duality

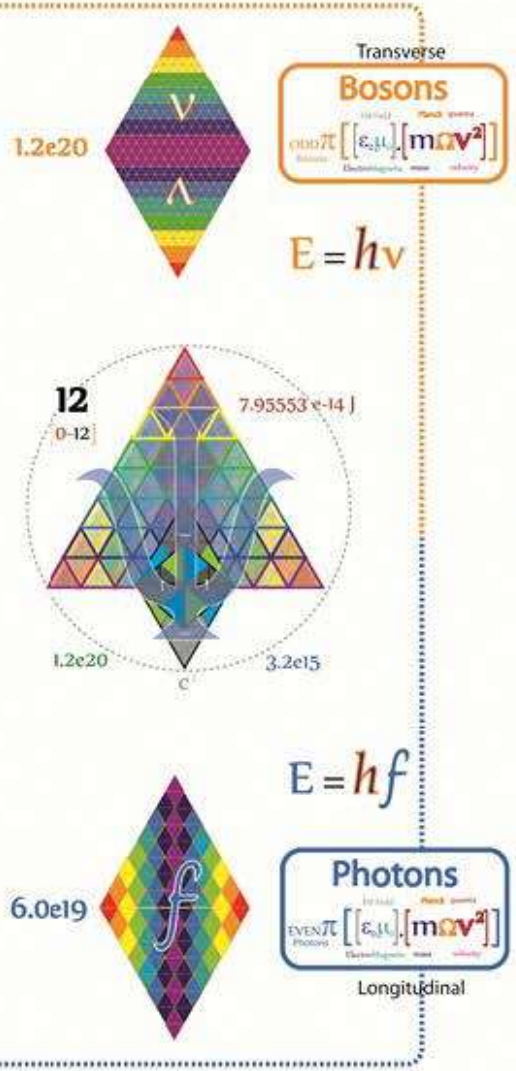
Everything is made up of
charged mass-energy quanta

ZPFs combine in ODD numbers to form
Bosons

Bosons combine to form
Quantum Levels

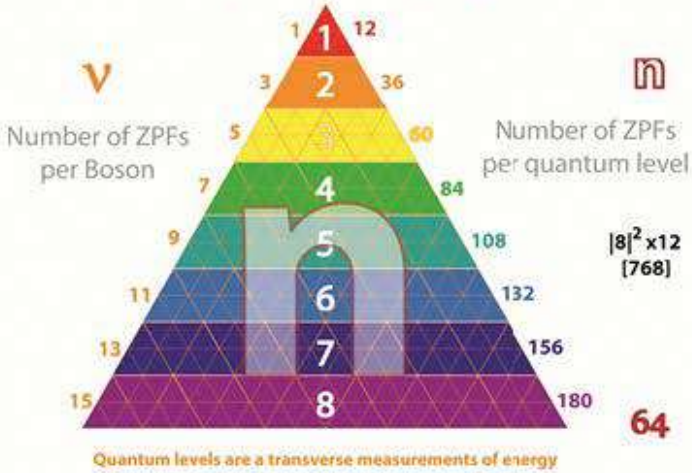


The quantum Planck quanta tesslation
of Matter can be accurately modelled with
Wave Probability mechanics

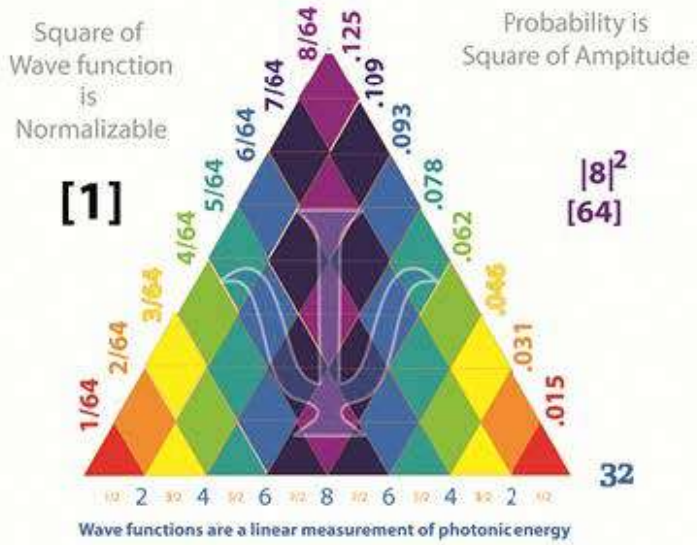


A n8 Electron is a massive particle
which has a Kinetic EM energy field
[6.4e15 planck quanta]

2D EM field geometries
can combine to form
3D Tetryonic Matter topologies



Equivalently, all Matter & EM waves can be viewed either in terms of their transverse boson or longitudinal photon content and/ or their associated mass-energy momenta geometries



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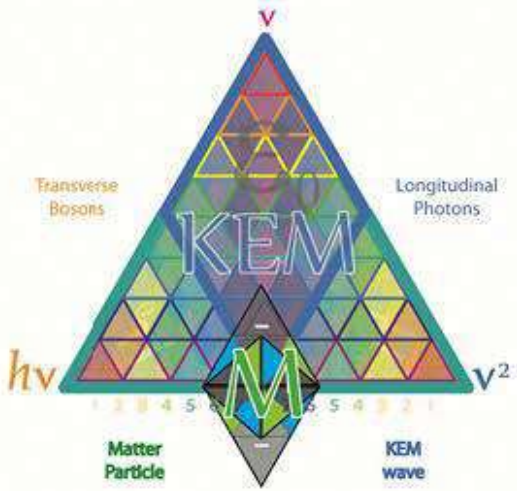
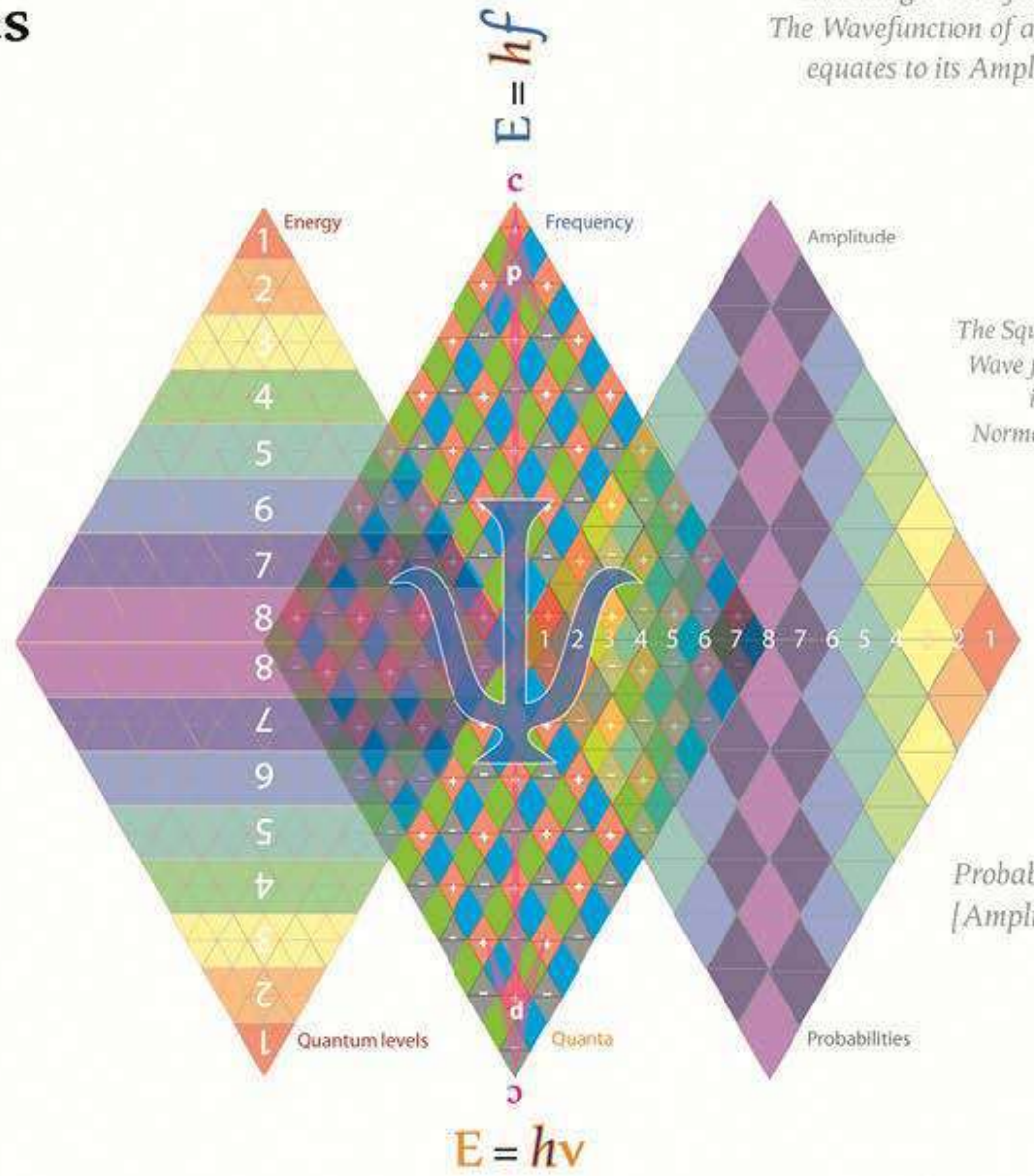
Wave-particle Probabilities

All Particles in motion exhibit a Wave-Particle duality
due to the 2D waveform geometry of its KEM wave
and the lorentz velcoity invariant
3D standing wave geometry of its Matter



Equilateral energy tessellation
provides the basis for the probabilistic
statisical mechanics and math for
all of Quantum Mechanics

Schrodinger Wavefunction
The Wavefunction of a Particle
equates to its Amplitude



The Square of a Wave function is Normalizable

Probability = [Amplitude]²

Born Probability Rule
The Probability of finding a Particle
is the Square of its Amplitude

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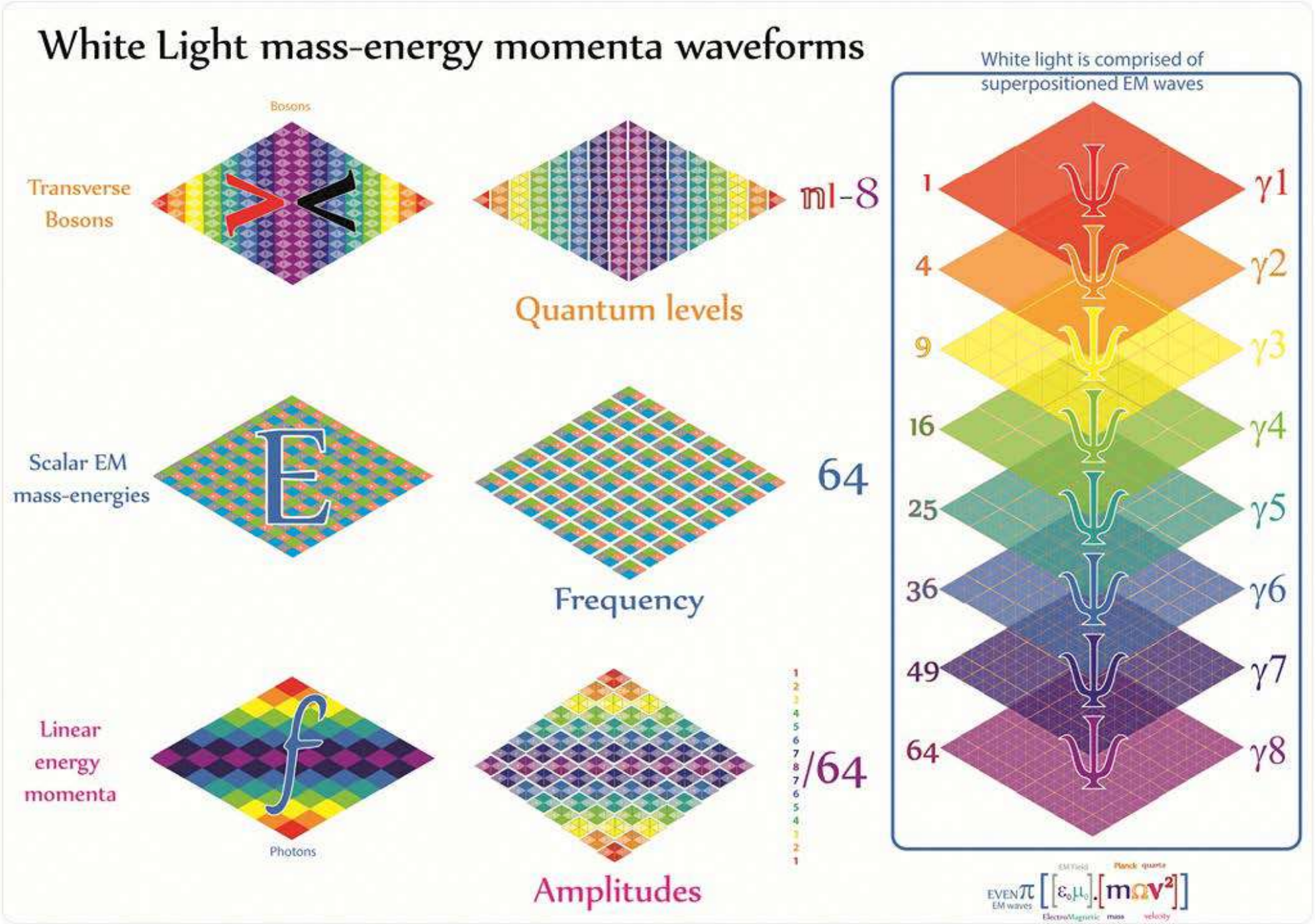

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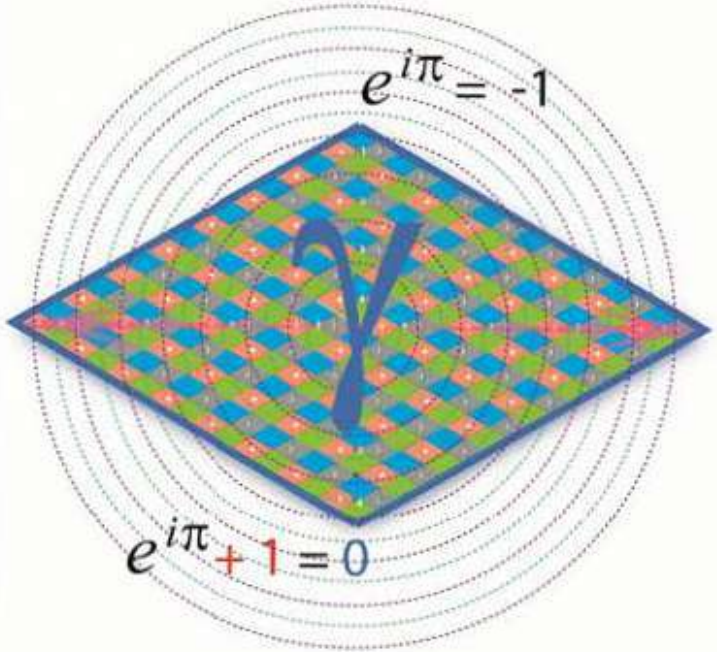
Bosons and Photons

EM waves are comprised of longitudinal [E=hf] Photons which in turn can also be measured as transverse [E=nhv] Bosons

Electro-Magnetic Fields



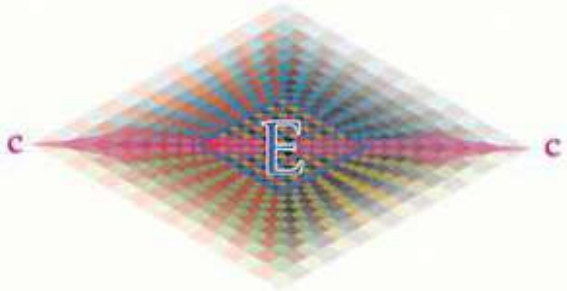
As described by Lorentz co-ordinate transforms the neutral quantum coin [quoin] geometry of all photons and EM waves have mirror E-field charges on each of their opposing fascia

2D planar mass-energy momenta waveforms

$$2\pi_{\text{Photons}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

Photons and EM waves have dual c^2 space-time geometries
(8.987551787 e16 m/s)

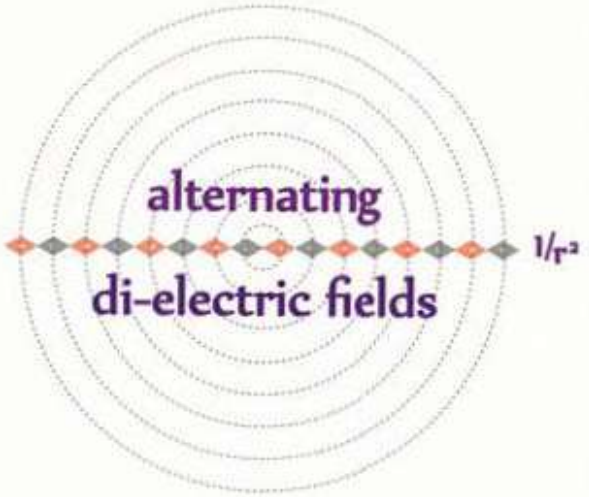


Photons and EM waves propagate outwards from their source at 'c'
(299,792,458 m/s)

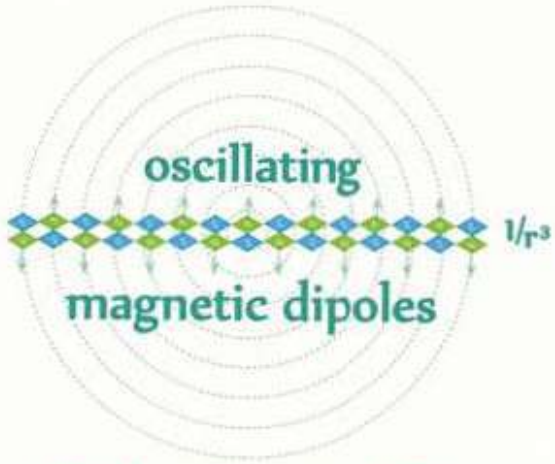
$$\text{EVEN}\,\pi_{\text{EM waves}}\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM Field (ElectroMagnetic) · Planck quanta (mass, velocity)

EM waves are detected as alternating radial electric E-wave radiation fields



EM wave radiation



The Magnetic vector of EM energy momenta propagate orthagonally to their E-fields

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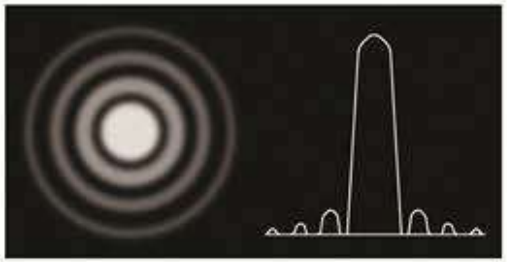
EM wave patterns

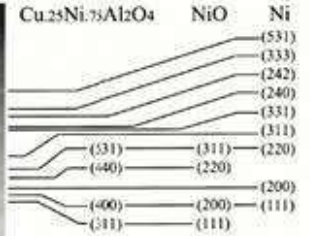
Polarised Photons and EM waves produce linear interference patterns



Diffraction occurs whenever propagating waves appear to bend around small obstacles in their path and spread out as smaller waves waves past any openings. its effects are generally most pronounced for waves whose wavelength is roughly similar to the dimensions of the diffracting objects.

If the obstructing object provides multiple, closely spaced openings, a complex pattern of varying intensity can result.

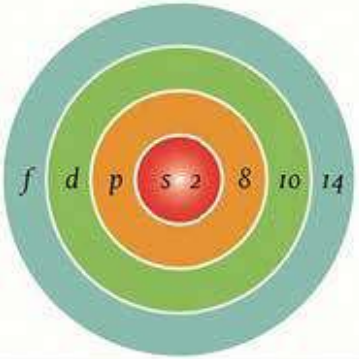
This is due to the superposition, or interference, of different parts of a wave that travels to the observer by different paths



atomic diffraction spectroscopy of matter plays an important role in the chemical analysis of elements and compounds

Diffraction occurs with all waves, including sound waves, water waves, as well as with electromagnetic waves such as visible light, X-rays and radio waves.

Un-Polarised Photons and EM waves produce circular diffraction patterns



Richard Feynman once commented that:
"No-one has ever been able to define the difference between interference and diffraction satisfactorily. It is just a question of usage, and there is no specific, important physical difference between them."

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Light waves

Thomas Young

(13 June 1773 – 10 May 1829)

In order to establish his wave theory of light Young had to overcome the century-old view, expressed by Sir Isaac Newton' in his treatise "Optics", that light is a particle of colour.

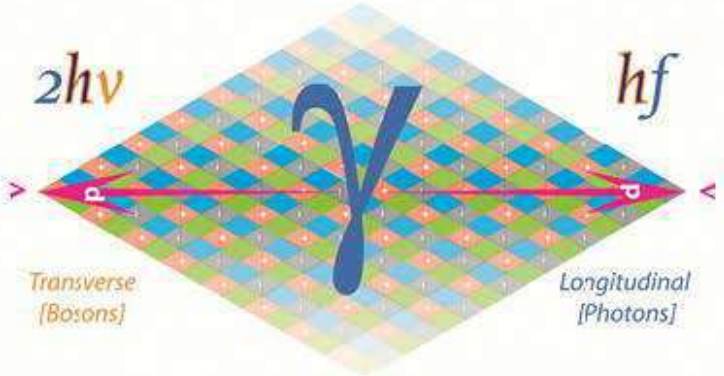
Thomas Young studied the interference of light waves by shining light through a screen with two slits equally separated, where the light emerging from the two slits would spread out and eventually superposition [overlap] each other to produce a distinct interference pattern

$$E = mv^2$$

"The term energy may be applied, with great propriety, to the product of mass or weight of a body, into the square of the number expressing its velocity.

Thus, if the weight of one ounce moves with a velocity of a foot in a second, we call its energy 1: if a second body of two ounces has a velocity of three feet in a second, its energy will be twice the square of three, or 18."

$$KE = \frac{1}{2}Mv^2$$

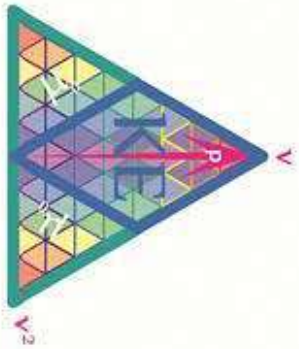


$$E_\gamma = 2mv^2$$

Photons are radiative Kinetic EM mass-energies

$$p^2 = KEM = Mv^2$$

All Light propagates at the speed of EM ENERGY



All EM waves have energy momenta geometries whose physical properties can be modeled with statisical probabilities due to their equilateral wavefunctions

Tetryonics reveals the true geometry of Light

and dispels the misconceptions surrounding its physical properties of wave-length, energy momenta, frequency and associated wave-function

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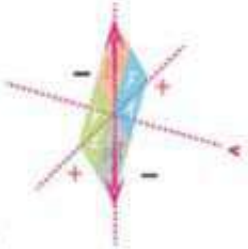
Photon-EM Wave Superpositioning

In physics, the Superposition principle, also known as superposition property, states that, for all linear systems, the net response at a given place and time caused by two or more stimuli is the sum of the responses which would have been caused by each stimulus individually.

$$F(\psi_1+\psi_2)= F(\psi_1) + F(\psi_2)$$

Positive quantum charge state is one side of the quantum energy momenta quoin

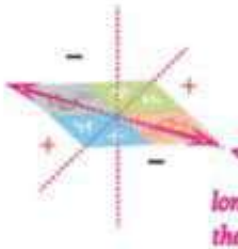
Negative quantum charge state is the other side of the quantum energy momenta quoin



The linear momenta of transverse waves is orthagonal to the direction of wave propagation

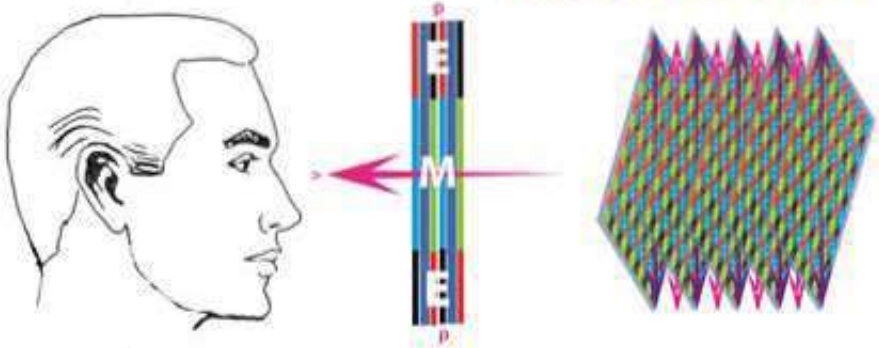
Photons are neutral EM wavepackets

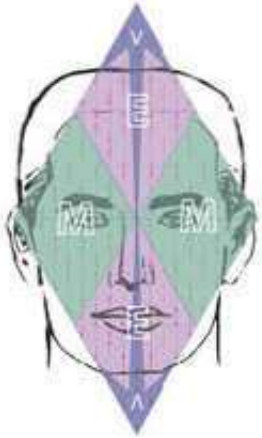
whose chiral quantum charges can be determined through Lorentz co-ordinate transformations



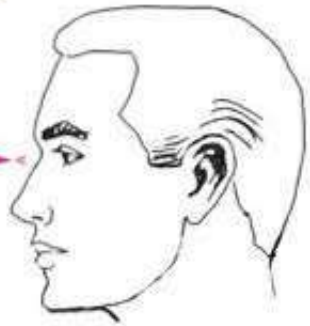
The linear momenta of longitudinal waves is co-linear to the direction of wave propagation

transverse Radio waves





longitudinal Spectral lines



$mc^{2\,2}$ *Superpositioned EM waves can be likened to the cells of a chemical battery* mv^4

E^2

p^4

It is the superpositioning of longitudinal EM waveforms that creates white light and linear interaction-at-a-distance forces

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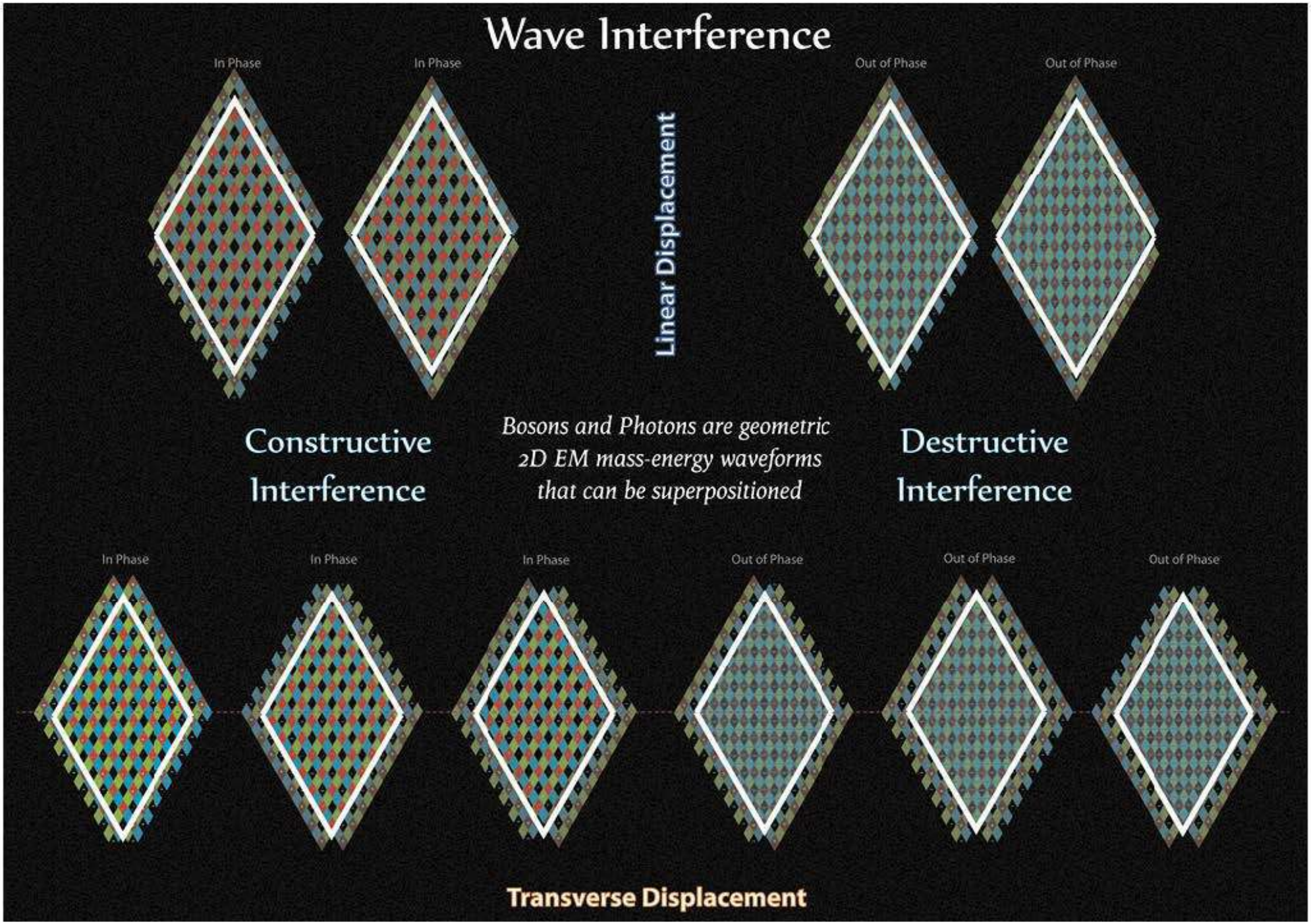

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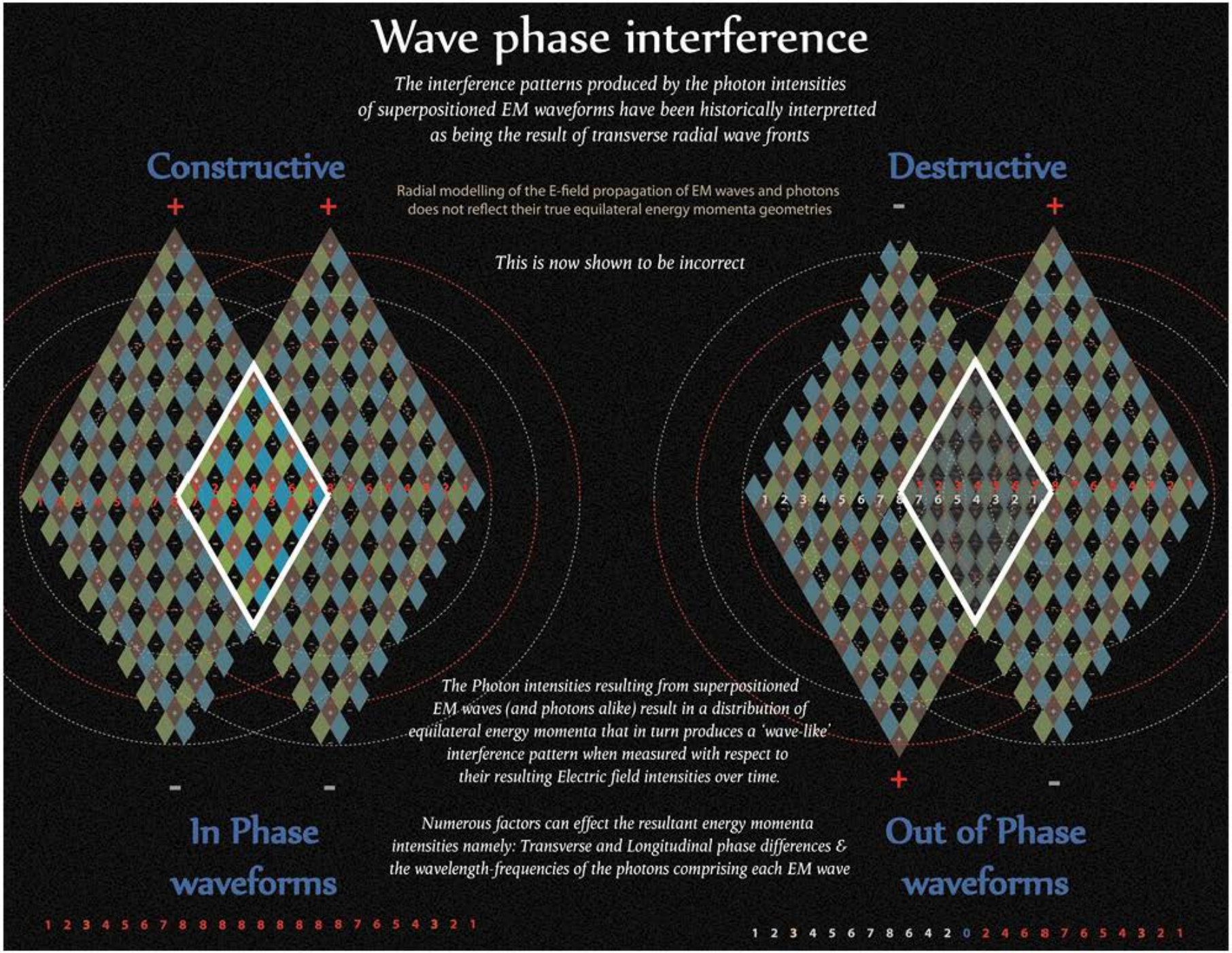
Wave phase interference
The interference patterns produced by the photon intensities of superpositioned EM waveforms have been historically interpretted as being the result of transverse radial wave fronts
Constructive
Destructive
Radial modelling of the E-field propagation of EM waves and photons does not reflect their true equilateral energy momenta geometries
This is now shown to be incorrect
The Photon intensities resulting from superpositioned EM waves (and photons alike) result in a distribution of equilateral energy momenta that in turn produces a 'wave-like' interference pattern when measured with respect to their resulting Electric field intensities over time.
Numerous factors can effect the resultant energy momenta intensities namely: Transverse and Longitudinal phase differences & the wavelength-frequencies of the photons comprising each EM wave
In Phase waveforms
Out of Phase waveforms

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Matter in motion

Transverse EM mass-energies

$E = h\nu$

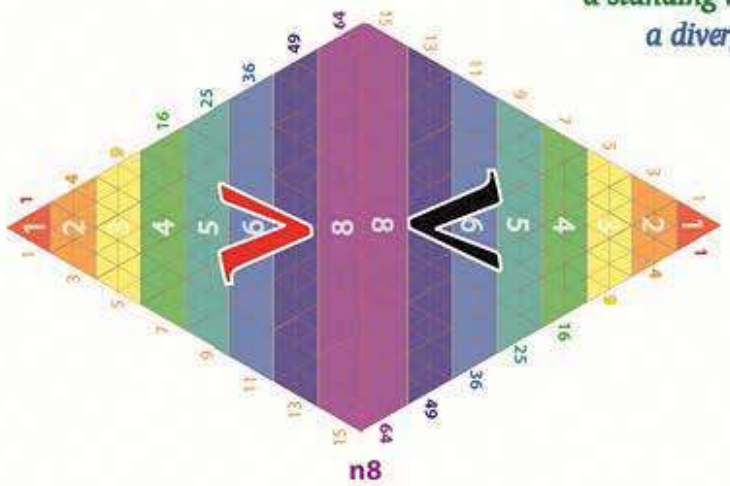
Longitudinal EM mass-energies

$E = hf$

Historically modeled through relativistic stress energy tensors all Matter in motion is possessive of distinct energy waveforms:

a standing wave mass-energy geometry [Matter particle] &
a divergent kinetic mass-energy field [KEM wave]

$T\mu\nu$



EM induction and forces are effected by neutral bi-directional KEM mass-energy fields with interactive energy momenta

Negative charges in motion

Positive charges in motion

unidirectional negative KEM fields with interactive energy momenta

electromagnetic waves

[neutral bosons and/or photons]

unidirectional positive KEM fields with interactive energy momenta

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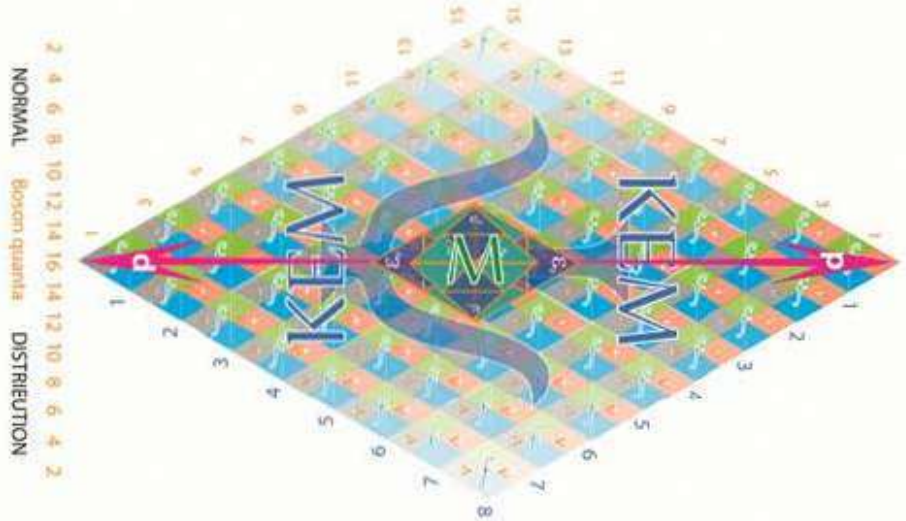
All Matter in motion [or not]
has both an intrinsic Matter-wave function
and an extrinsic KEM mass-energy wave function

Transverse boson wavefunction

$$\text{ODD}\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right] \qquad E = n.h\nu$$

EM Field · Planck quanta · Bosons · ElectroMagnetic · mass · velocity

128



$$\text{EVEN}\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right]$$

EM waves · EM Field · ElectroMagnetic · mass · velocity · Planck quanta

64

$$2\pi\left[\left[\varepsilon_0\mu_0\right].\left[m\Omega v^2\right]\right] \qquad E = hf$$

Photons · EM Field · Planck quanta · ElectroMagnetic · mass · velocity

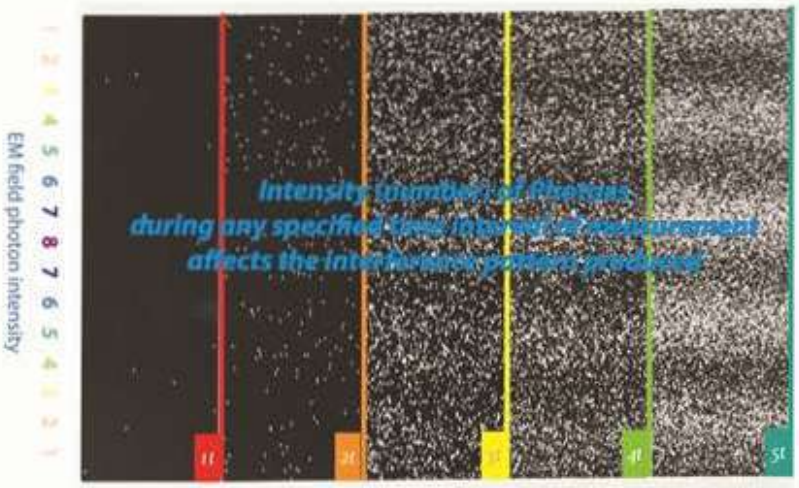
Longitudinal photon wavefunction

Photon Intensity

Photon Intensity is a result of the geometry of EM waves [which in turn is directly proprtional to the velocity of the mass-Matter] and can be measured in a number of vaying ways related to the mass-energy momenta of the EM wave

Wavenumbers, frequency or wavelength
Transverse EM masses [BOSONS]
Longitudinal EM masses [PHOTONS]
Wavefunction probabilities [WAVE-FUNCTIONS]

The wave~particle nature of mass-Matter in motion has been the subject of much debate since Lucretius in 55BC with the debate intensifying with Newton's and Young's differing views and the development of Planck-Einstein quantum mechanics of the photo-electric effect


EM field photon intensity
Intensity (number of photons
during any specified time interval) measurement
affects the interference pattern produced

The measurement of Photons with the use of Photo-multipliers and Charge coupled Devices results in the measurement of the E field properties of EM waves (producing the long confusing wave-particle results obtained by diffraction gratings)

In turn these results have been historically misimerpreted as a waveform property that cannot be attributed to the particle properties of a Photon.

Tetryonic geometry clears this matter up once and for all.

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Interference Patterns

$E = h\nu$

ε_0

When EM waves pass through
the slits they are detected via their E-fields
as photons of varying strength energy momenta
producing the impression of a interference pattern

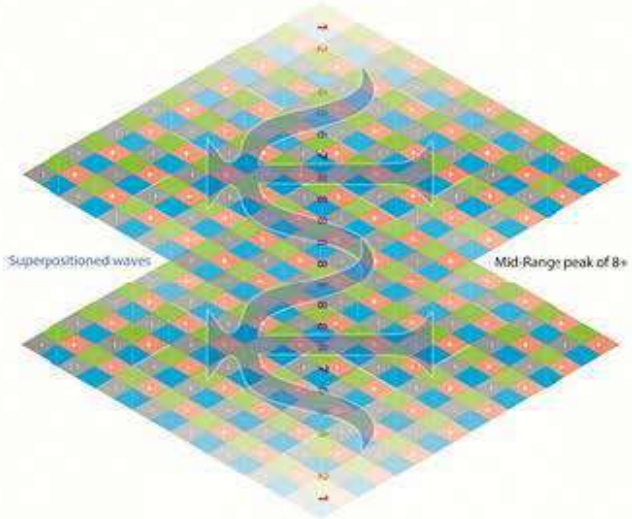
μ_0

$E = hf$

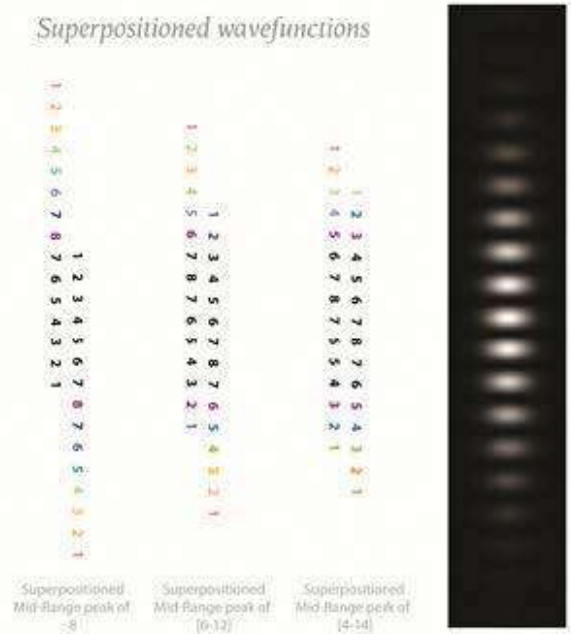
Every EM wave is comprised of identical, specific wavelength photons which are arranged in a Normal distribution resulting from the electromagnetic Wavefunction with a peak value equal to the wave's amplitude

[the square root of the EM wave's Wavefunction/Probability amplitude]

Photons impact screens and
photo-detectors with intensities
that are determined by their
energy momenta distributions



The resultant amplitudes are a direct result of the Phase of the Superpositioned photons within EM waves


Superpositioned wavefunctions
Superpositioned Mid-Range peak of 8
Superpositioned Mid-Range peak of [6-12]
Superpositioned Mid-Range peak of [4-14]

ALL EM mass-ENERGY Matter geometries
being comprised of energy-momenta quanta
are capable of producing interference patterns

The amplitudes of the detected photons in the resultant interference patterns are determined by their constructive/destructive superpositioning in each wave explaining the interference patterns currently accounted for by Young's wave theory

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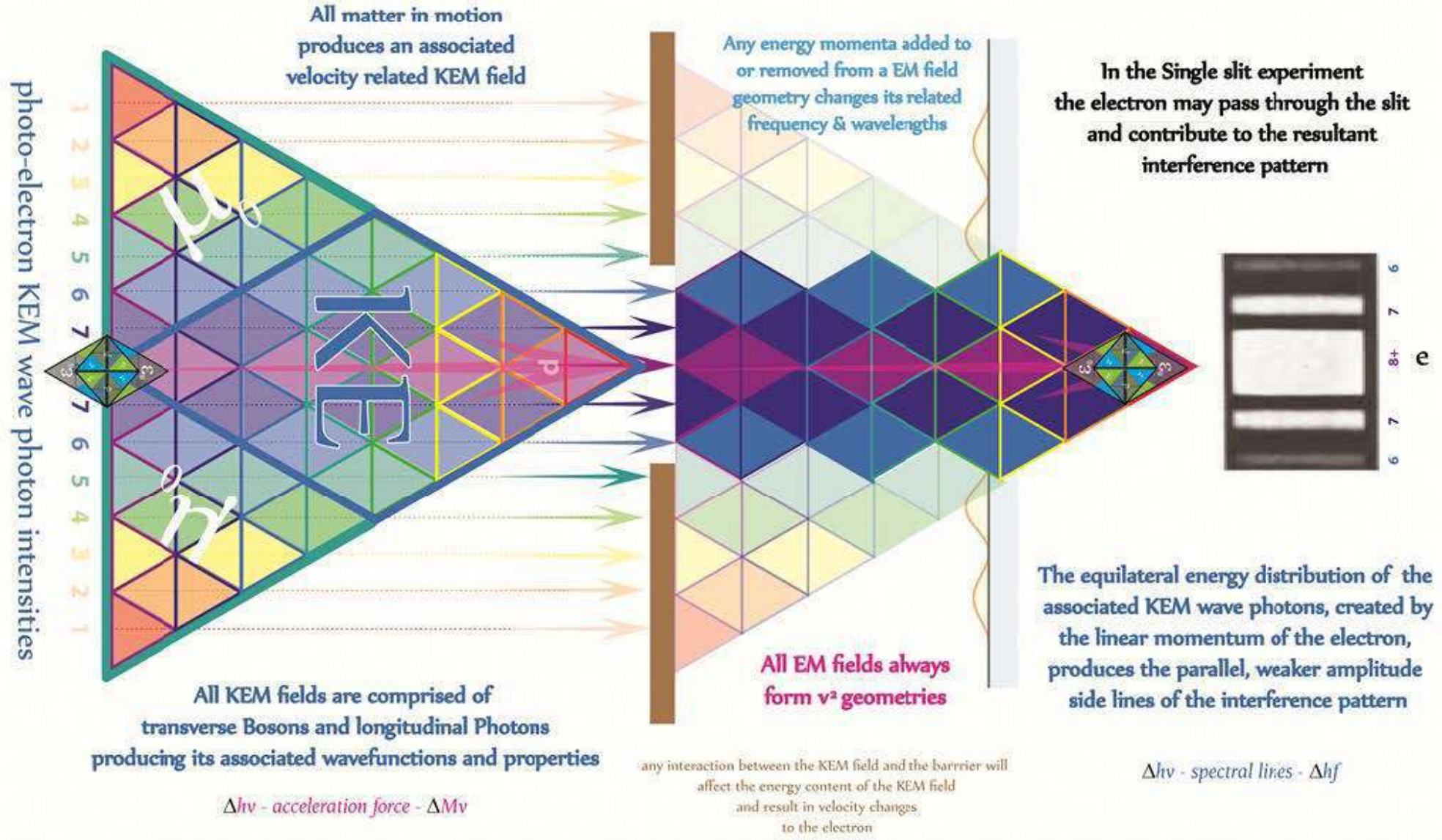
Single slit experiment

If light consisted strictly of ordinary or classical particles, and these particles were fired in a straight line through a slit and allowed to strike a screen on the other side, we would expect to see a pattern corresponding to the size and shape of the slit. However, when this "single-slit experiment" is actually performed, the pattern on the screen is a diffraction pattern with a fairly narrow central band with ever diminishing bands parallel to it on either side


All matter in motion
produces an associated
velocity related KEM field
photo-electron KEM wave photon intensities
Any energy momenta added to
or removed from a EM field
geometry changes its related
frequency & wavelengths
In the Single slit experiment
the electron may pass through the slit
and contribute to the resultant
interference pattern
All KEM fields are comprised of
transverse Bosons and longitudinal Photons
producing its associated wavefunctions and properties
Δhv - acceleration force - ΔMv
All EM fields always
form v² geometries
any interaction between the KEM field and the barrier will
affect the energy content of the KEM field
and result in velocity changes
to the electron
The equilateral energy distribution of the
associated KEM wave photons, created by
the linear momentum of the electron,
produces the parallel, weaker amplitude
side lines of the interference pattern
Δhv - spectral lines - Δhf

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Double slit experiments

The double-slit experiment, sometimes called Young's experiment, is a demonstration that matter and energy can display characteristics of both waves and particles, and demonstrates the fundamentally probabilistic nature of quantum mechanical phenomena and Establishes the quantum interference principle known as wave–particle duality.

Matter particles are stopped by the barrier but the [K]EM wave passes through both slits and is diffracted by them producing weaker EM waves that then superposition with each other to produce interference patterns

It is not the Particle passing through both slits that produces an interference pattern it is the particle's associated K[EM] wave

Equilateral superpositioned KEM waves produce constructive and destructive interference waves that have historically been interpreted as being circular wavefronts

photo-electron KEM wave photon intensities

The Compton frequency of any [K]EM wave is comprised of identical wavelength Photons which can combine to produce interference patterns

electrons will be stopped by the material barrier but their associated KEM field energy momenta will be absorbed by the screen and 'tunnel through' the barrier to contribute to the interference pattern

Any detctor placed after the primary screen will remove energy from the secondaryKEM fields and affect the interference patterns produced

final interference pattern produced will depend on phase relationships of the two super-positioned wavefronts

In the basic version of the experiment, a coherent light source such as a laser beam illuminates a thin plate pierced by two parallel slits, and the light passing through the slits is observed on a screen behind the plate. The wave nature of light causes the light waves passing through the two slits to interfere, producing bright and dark bands on the screen — a result that would not be expected if light consisted strictly of particles. However, on the screen, the light is always found to be absorbed as though it were composed of discrete particles or photons.

If one slit is observed for the passage of the electron in order to determine its physical state then the its KEM field wave will be absorbed by the detector resulting in only one wave remaining, enforcing a classical particle outcome

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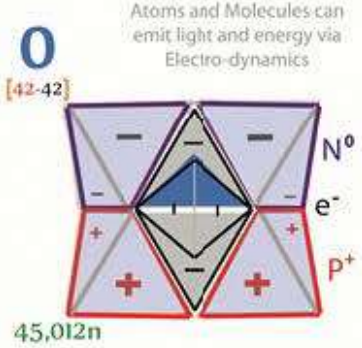
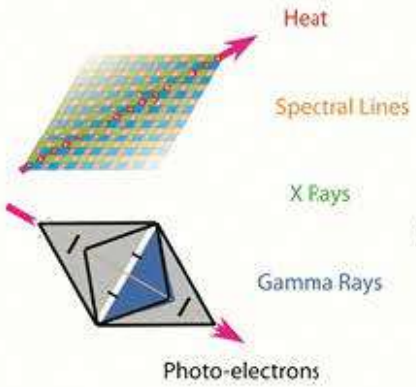
Light wave Reflection

Excited (or higher energy) Atoms and Molecules can emit light and energy via Electro-dynamics





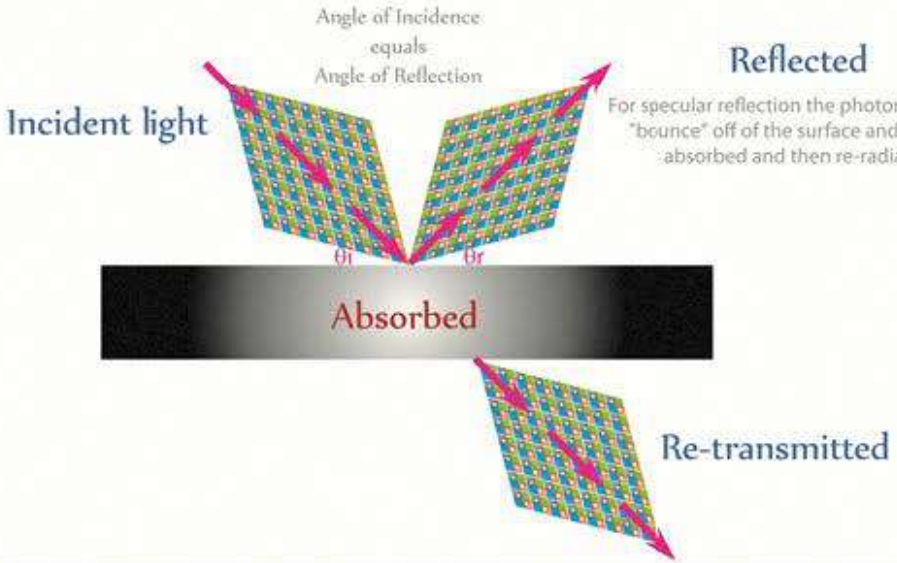
The emitted photon/particle can go in any direction so this is the mechanism for diffuse reflection/radiation.

All Atoms and Molecules have ANGULAR charged fascia in their topologies

Incoming light interacts with a surface and may be absorbed, refelected, and/or transmitted.

Materials have a reflectance spectrum which is a function of the angle of incidence of the incoming light.

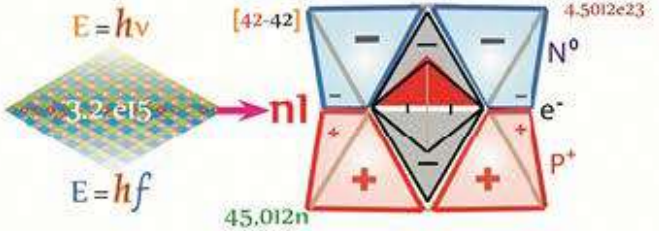
The color of an object is a function of the color spectrum of the incident light and the reflectance spectrum of the object's surface.



Reflected

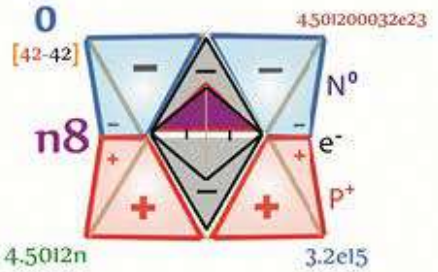
For specular reflection the photons actually "bounce" off of the surface and are not absorbed and then re-radiated

Photon Re-Transmission



When a photon strikes a atom or molecule it generally imparts EM energy as heat and the photon is absorbed

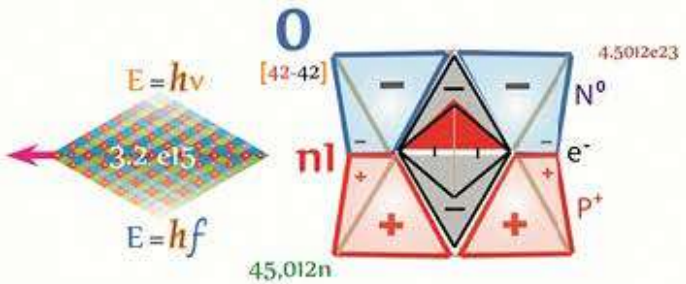
Photon absorption



For some photons their EM energy is equal to the resonance energy of the molecule.

When this happens the photon is absorbed and the molecule is put into an excited state

Photon emission



The molecule relaxes from the excited state back to the ground state by emitting a photon with EM energy equal to that of the original photon so the photon appears to have been reflected (but is actually absorbed then emitted)

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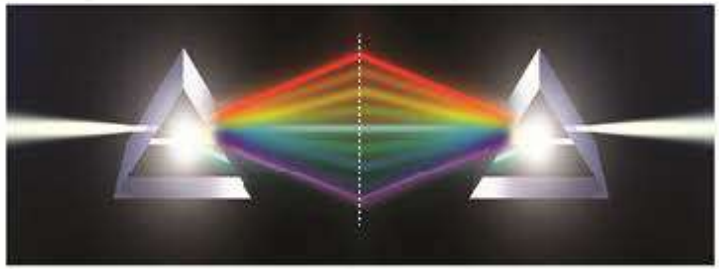
Lightwave Refraction

The refraction of light when it passes from a fast medium to a slow medium bends the light ray toward the normal at the boundaries between any two media.

The amount of bending depends on the indices of refraction of the two media and is described quantitatively by Snell's Law.

White light can be refracted into its component spectral colours



or be re-combined back into white light through superpositioning

The Fresnel equations, deduced by Augustin-Jean Fresnel describe the behaviour of light when moving between media of differing refractive indices

White Light is comprised of superpositioned waves with differing EM wavelengths

Refraction is the bending of a wave when it enters a medium where it's velocity differs to that in a vacuum

v

n2

θi

θr

n1 c

c n1

Varying refractive indices (n) of differing materials produces slower velocities of light in those materials

interference pattern

vphoto-dector

IR heat

n1
n2
n3
n4
n5
n6
n7
n8

Gamma rays

Microwaves

Visible Light

UV rays

visible light spectra comprise only a small percentage of the EM spectrum

$c = \lambda . f$

Its wavelength increases or decreases but its frequency remains constant

$v = \lambda . f$

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Ball Lightning

An alternative radiant geometry for electromagnetic waves exists

γ1

The EM energies in radiant 'ball' lightning are transformer-couplings of energy momenta & self-sustaining until any interaction with Matter topologies occurs

γ3

Descriptions of ball lightning vary wildly. It has been described as moving up and down, sideways or in unpredictable trajectories, hovering and moving with or against the wind; attracted to, unaffected by, or repelled from buildings, people, cars and other objects.

Ball lightning has been described as transparent, translucent, multicolored, evenly lit, radiating flames, filaments or sparks, with shapes that vary between spheres, ovals, tear-drops, rods, or disks

γ5

γ2

γ4

Any interaction with a 'ball' of EM energies will result in an explosive discharge of it's EM energy momenta

γ7

γ6

Nikola Tesla was reportedly able to artificially produce 1.5" (3.8 cm) balls using spark gap technologies

Ball lightning creates a strong Magnetic moment and divergent E fields [similar to a bar magnet without the Matter] creating a "Ball' of light with varying EM energies that is sensitive to external M fields

γ8

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Wave~Particle interaction-at-a-distance

All Matter in motion has both:

a standing wave energy topology [Particle] and

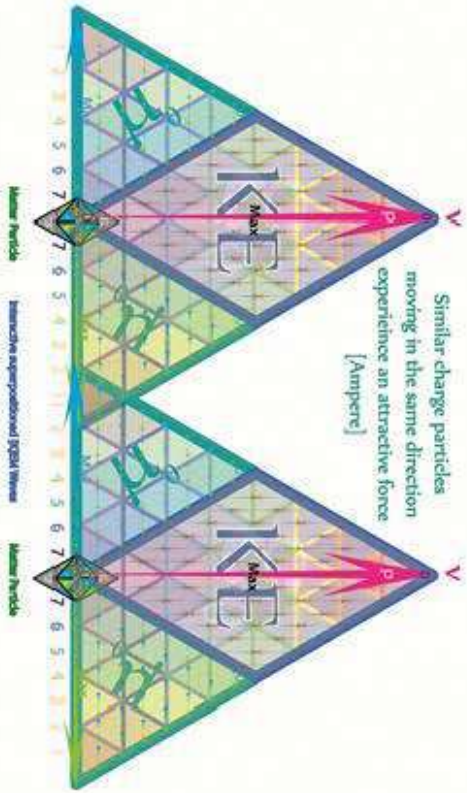
a divergent relativistic. Lorentz velocity corrected geometric field of mass-energy momenta [KEM Wave]

photo-electron KEM wave photon intensities

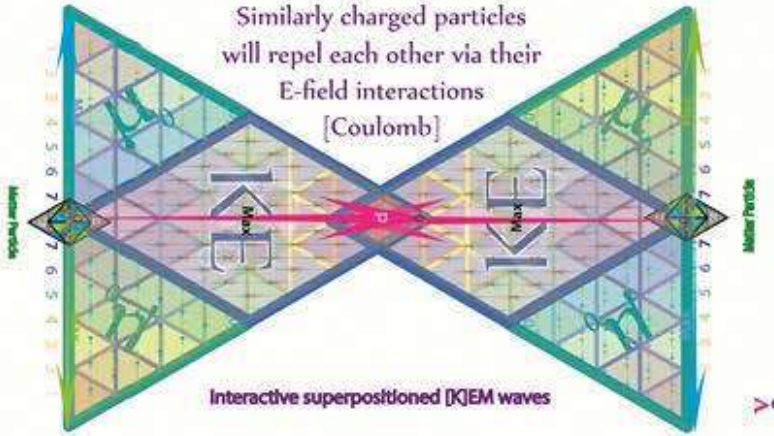
Whether it is Light itself or the KEM field of Matter in motion all EM fields are comprised of transverse bosons and longitudinal photons with probabillistic wave geometries

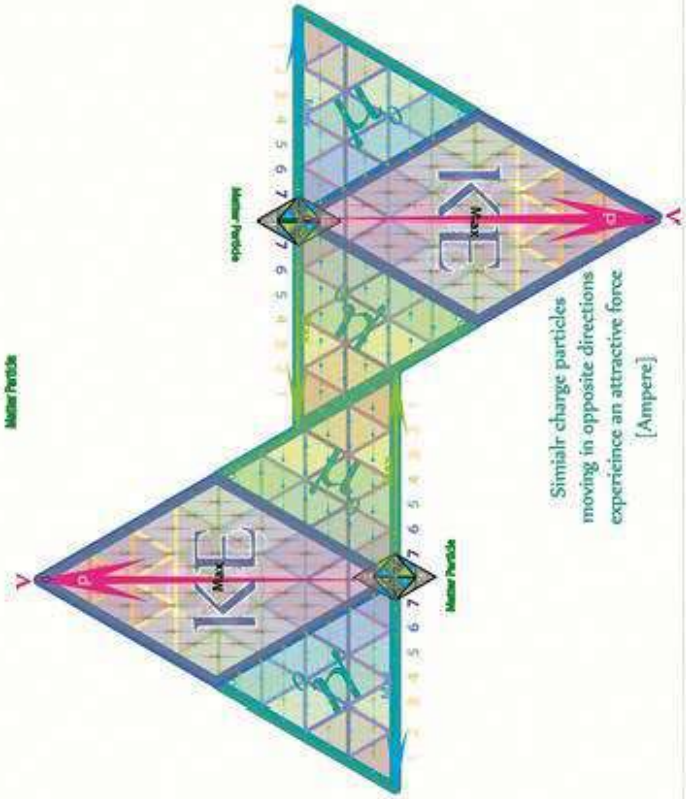
$$RE = M + KEM$$

relativistic energies — Matter — kinetic energies



Similarly charged particles
will repel each other via their
E-field interactions
[Coulomb]





Force fields and interaction-at-a-distance

All Matter in motion produces an associated Lorentz velocity corrected KEM field of interactive energy momenta photons

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Quantum Tunnelling

Particles attempting to travel between potential barriers can be compared to a ball trying to roll over a hill; quantum mechanics and classical mechanics differ in their treatment of this scenario.

Classical mechanics predicts that particles that do not have enough energy to classically surmount a barrier will not be able to reach the other side. Thus, a ball without sufficient energy to surmount the hill would roll back down.

Or, lacking the energy to penetrate a wall it would bounce back (reflection) or in the extreme case, bury itself inside the wall (absorption).

In quantum mechanics, these particles can, with a very small probability, tunnel to the other side, thus crossing the barrier.

The quantum magician's slight of hand trick is where the incident electron is swapped another

All electrons are IDENTICAL

It is practically impossible to identify a particular electron and track it

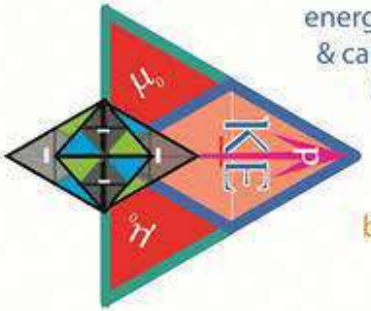
even using spin orientations only eliminates half of the total electrons in the barrier

Reflection of Particle

If the collision is inelastic the KEM field energy will be reduced along with the particle's velocity

Absorption of Particle

When the electron is captured by an atom its KEM energies will continue to propagate until it is absorbed or makes its way out through re-emission



KEM field 'tunnels' out

Quantum KEM field tunnelling is an example of conservation of energy momenta on the atomic scale & can be likened to a unidirectional version of Newton's cradle

Removal of all electrons but the one under measurement is impractical as it would result in an attractive coloumbic force that would trap the electron in the barrier

The most probable explanation of quantum tunneling is that the original electron was bound to atoms in the material barrier and its KEM field propagated through the barrier along its original direction of momentum.

Upon reaching the opposite side/edge of the barrier its remaining energies are able to accelerate any weakly bound electron found there

Quantum 'tunnelling' is revealed to be the result of an electron's KEM wave propagation through the barrier not the electron itself

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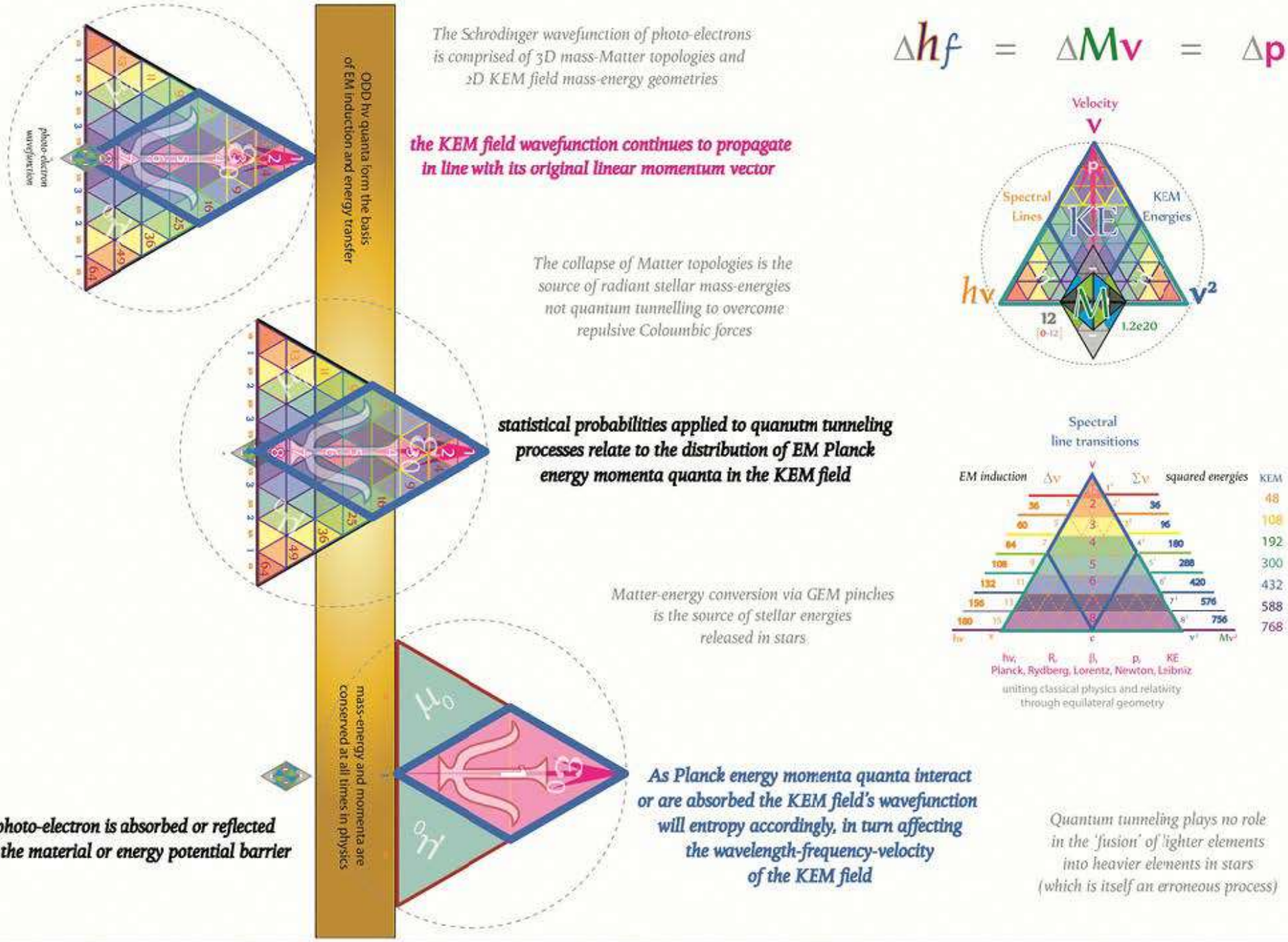
photo-electron wavefunction
ODD hv quanta form the basis of EM induction and energy transfer
mass-energy and momenta are conserved at all times in physics
The Schrodinger wavefunction of photo-electrons is comprised of 3D mass-Matter topologies and 2D KEM field mass-energy geometries
the KEM field wavefunction continues to propagate in line with its original linear momentum vector
The collapse of Matter topologies is the source of radiant stellar mass-energies not quantum tunnelling to overcome repulsive Coloumbic forces
statistical probabilities applied to quanutm tunneling processes relate to the distribution of EM Planck energy momenta quanta in the KEM field
Matter-energy conversion via GEM pinches is the source of stellar energies released in stars
photo-electron is absorbed or reflected by the material or energy potential barrier
As Planck energy momenta quanta interact or are absorbed the KEM field's wavefunction will entropy accordingly, in turn affecting the wavelength-frequency-velocity of the KEM field
Quantum tunneling plays no role in the 'fusion' of lighter elements into heavier elements in stars (which is itself an erroneous process)
Δhf = ΔMv = Δp
Velocity
v
Spectral Lines
KEM Energies
KE
hv
v²
M
12
[0-12]
1.2e20
Spectral line transitions
EM induction
Δv
Σv
squared energies
KEM
48
108
192
300
432
588
768
hv, R, β, p, KE
Planck, Rydberg, Lorentz, Newton, Leibniz
uniting classical physics and relativity through equilateral geometry

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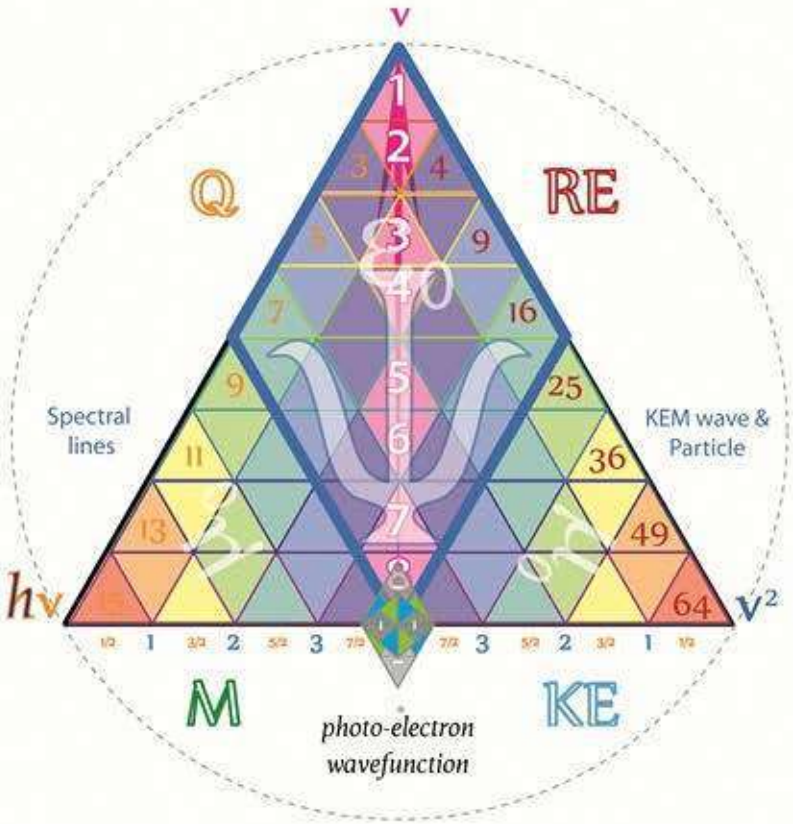
All Matter in motion is comprised of:

a mass-Matter standing-wave topology,
and
a KEM mass-energy field geometry

whose quantised energy momenta is reflective of the particle's vector velocity



The normal distribution of Planck energy momenta in any KEM field is the quantum foundation for the statistical probability mechanics of quanutm mechanics and quantum electrodynamics

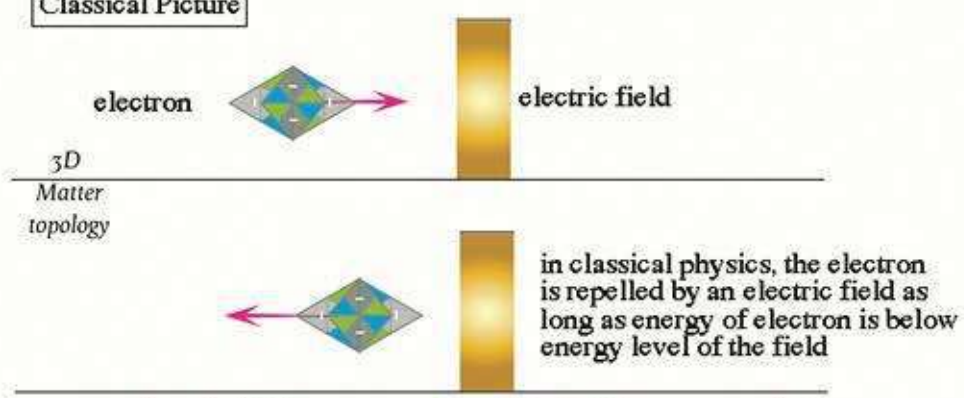
e-

Quantum Tunneling

it makes no difference if the barrier is a EM field or material object

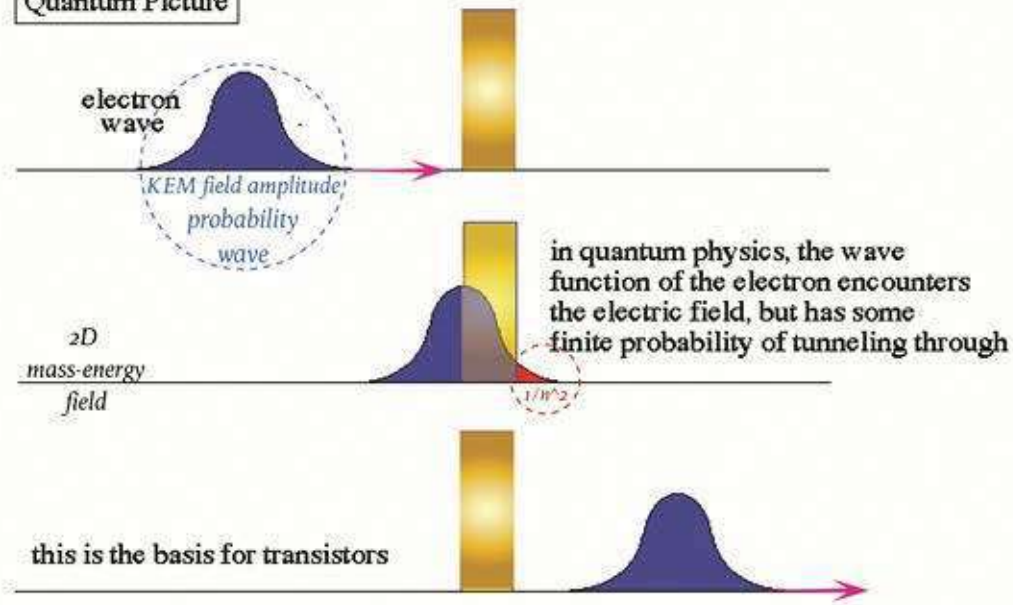
electrons are NOT spherical point particles

Classical Picture


electron
electric field
3D
Matter
topology
in classical physics, the electron is repelled by an electric field as long as energy of electron is below energy level of the field

the topological Matter component of a particle's relativisitic quantum wavefunction is distinct from its Lorentz corrected KEM field mass-energy geometry

Quantum Picture


electron wave
KEM field amplitude probability wave
in quantum physics, the wave function of the electron encounters the electric field, but has some finite probability of tunneling through
2D
mass-energy
field
this is the basis for transistors

quantum tunnelling is often also utilised in modern physics as a means of overcoming Coulombic charge barriers of Protons in stars in order to explain 'fusion' as the source of stellar energy

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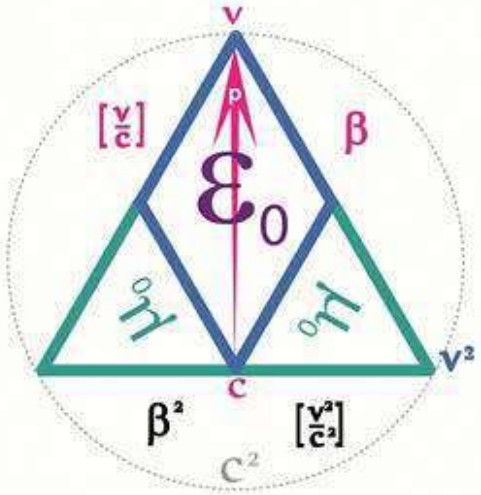
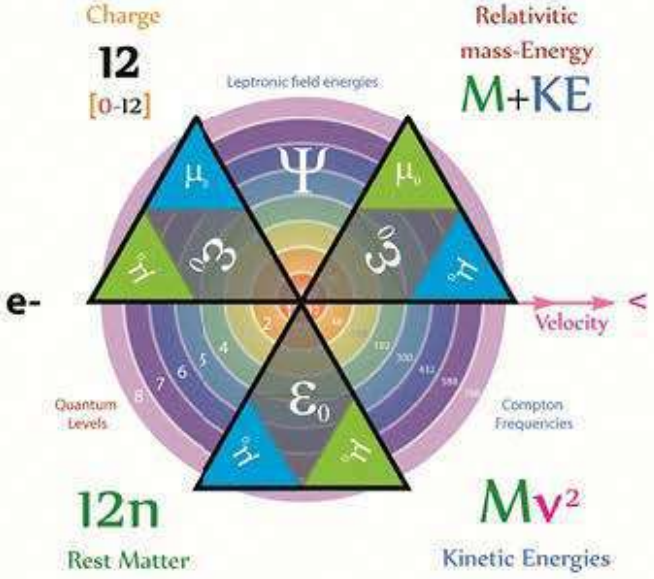
Relativistic Kinetic Energies

$KE = \frac{1}{2}Mv^2/c^2$

The relativistic Kinetic mass-energies of all Matter topologies in motion are contained in their KEM fields and are subject to Lorentz velocity corrections

$p^2 = E = mv^2/c^2$





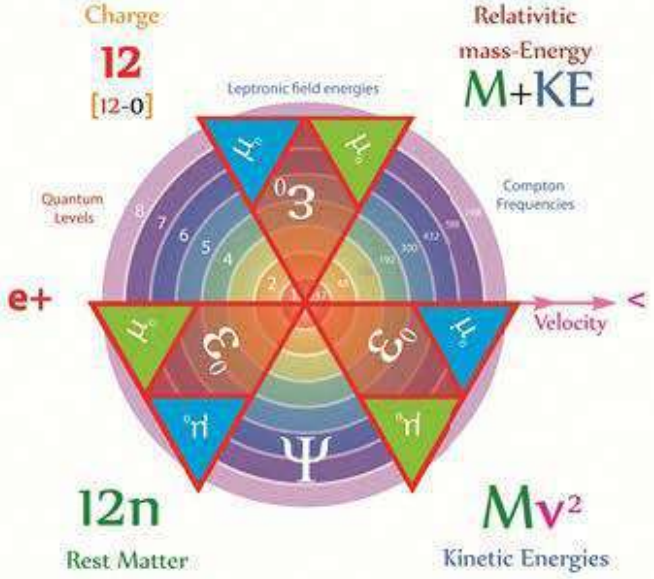
Lorentz contractions only apply to the KEM fields of Matter in motion

The Kinetic Energies of a particle in motion can be expressed in terms of its linear momentum

$\frac{p^2}{2m} = KE = \frac{1}{2}Mv^2$

or equally as 1/2 the total relativistic EM mass-energies [exclusive of its invariant rest mass-Matter]

Charge and Matter topologies are Lorentz invariant



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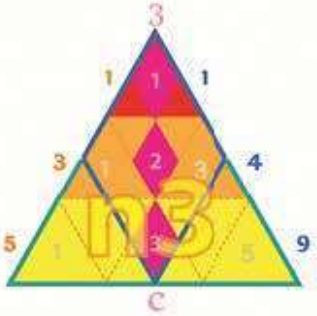
Relativistic Lorentz Corrections

ges their name from their earliest appearance, in Lorentzian electrodynamics
as velocity increases the wavelengths and physical scalar geometries of Planck quanta decreases



Linear correction factor

$$\beta = \left[\frac{v}{c}\right]$$

Scalar correction factor

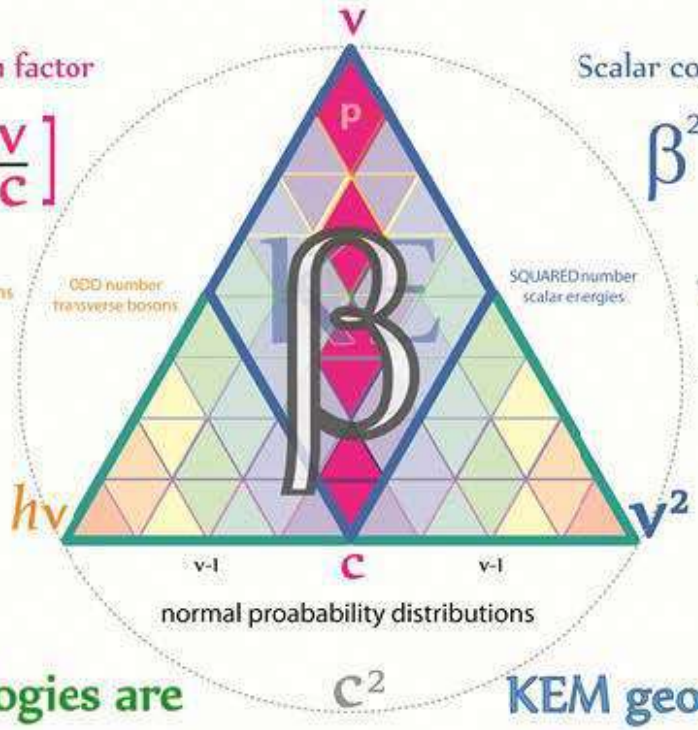
$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

Equilateral QAM contractions

$$t' = \frac{t}{\sqrt{1 - \frac{v^2}{c^2}}}$$

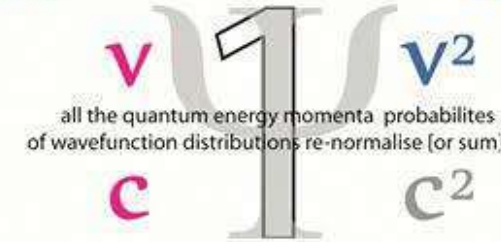
'WAVE-length' contractions

$$L = L'\sqrt{1 - \frac{v^2}{c^2}}$$



Matter topologies are Lorentz invariant

KEM geometries are relativistic fields



The poor definitions of EM mass & Matter has led to the incorrect application of Lorentz corrections to Matter

Lorentz contractions apply to [K]EM waveforms only

c is the limiting velocity for the electrical acceleration of Matter

$$\sqrt{1-\beta^2}$$

Incorrectly applied to Matter topologies in motion. The Lorentz factor or Lorentz term appears in several equations in special relativity.

$$\sqrt{1-\left(\frac{v}{c}\right)^2}$$

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The Energy of a Magnet

It is known that Maxwell's electrodynamics--as usually understood at the present time--when applied to moving bodies, leads to asymmetries which do not appear to be inherent in the phenomena. Take, for example, the reciprocal electrodynamic action of a magnet and a conductor. The observable phenomenon here depends only on the relative motionof the conductor and the magnet, whereas the customary view draws a sharp distinction between the two cases in which either the one or the other of these bodies is in motion. For if the magnet is in motion and the conductor at rest, there arises in the neighborhood of the magnet an electric field with a certain definite energy, producing a current at the places where parts of the conductor are situated. But if the magnet is stationary and the conductor in motion, no electric field arises in the neighborhood of the magnet.

In the conductor, however, we find an electromotive force, to which in itself there is no corresponding energy, but which gives rise--assuming equality of relative motion in the two cases discussed--to electric currents of the same path and intensity as those produced by the electric forces in the former case. [On the electrodynamics of moving bodies, A. Einstein, 1905]

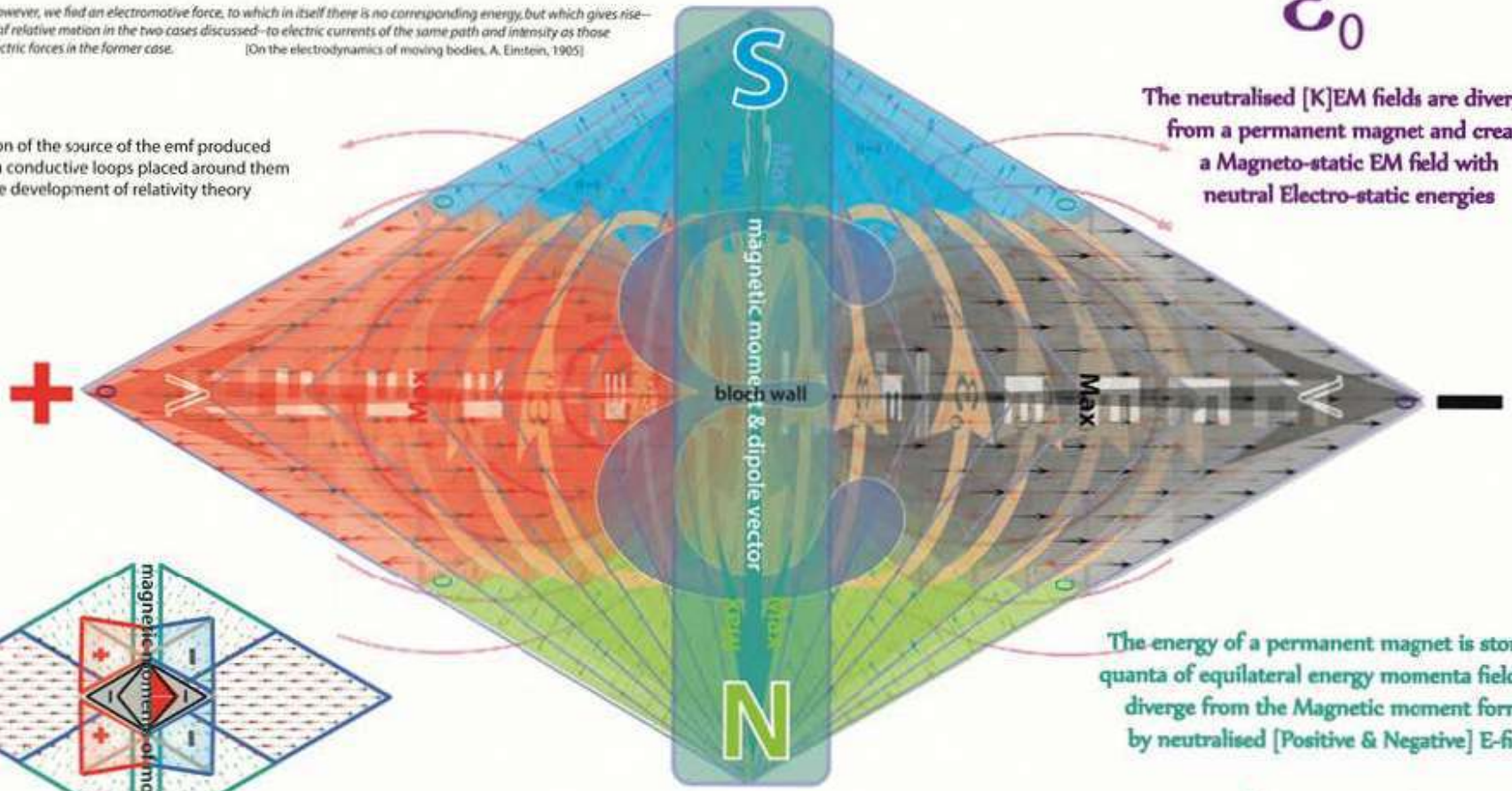
Investigation of the source of the emf produced by magnets in conductive loops placed around them led to the development of relativity theory

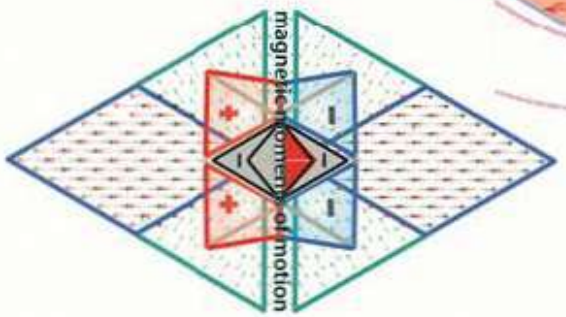
V

Energy can be removed by placing a conductive loop between any Positive and Negative quanta the EM field thus creating a potential difference & an electro-motive force

ε_0

The neutralised [K]EM fields are divergent from a permanent magnet and create a Magneto-static EM field with neutral Electro-static energies





The energy of a permanent magnet is stored in quanta of equilateral energy momenta fields that diverge from the Magnetic moment formed by neutralised [Positive & Negative] E-fields

Magnetic fields are produced by moving electric charges and the intrinsic magnetic moments of elementary particles associated with a fundamental quantum property, their spin. In special relativity, electric and magnetic fields are two interrelated aspects of a single object, called the electromagnetic field tensor; the aspect of the electromagnetic field that is seen as a magnetic field is dependent on the reference frame of the observer. In QED, the electro-magnetic field is quantized and electromagnetic interactions result from the exchange of photons.

Ω

Classically, the energy of a permanent magnet 'circulates in endless loops' from North to South in 3 dimensions around the magnetic moment

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$E = h\nu$

BOSONS are transverse EM waves [charge carriers]

PHOTONS are longitudinal EM waves [neutral charge carriers]

$E = hf$

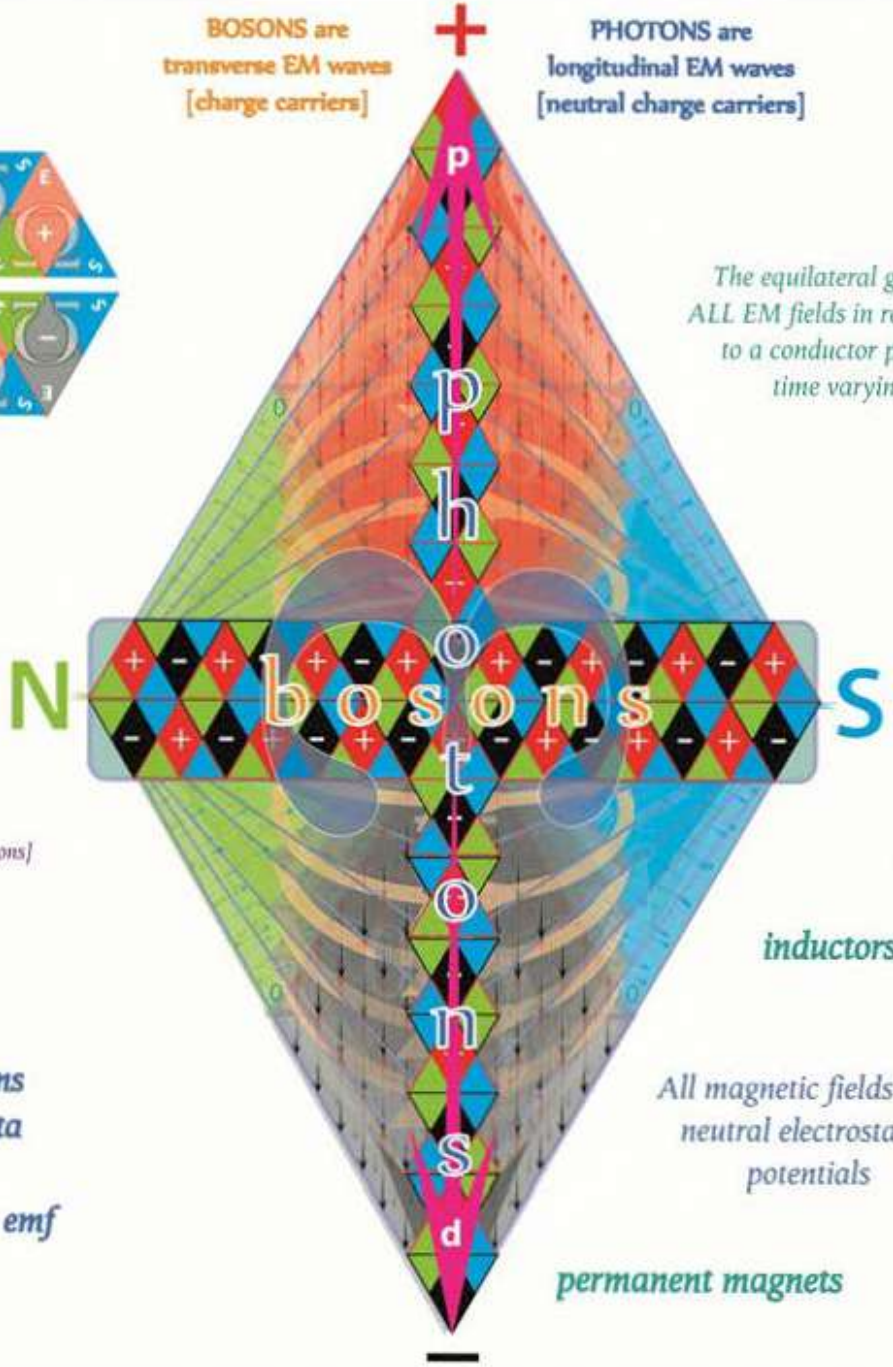
The equilateral geometry of ALL EM fields in relative motion to a conductor produces a time varying emf

$B = -\frac{d\phi_\varepsilon}{dt}$

A changing Electric field produces a changing Magnetic field

The is no such entity as a purely Electric field [all fields are Electro-Magnetic in their geometric foundations]

Any two separated charge bosons contain charged energy momenta that once connected via a conductive circuit will produce an emf



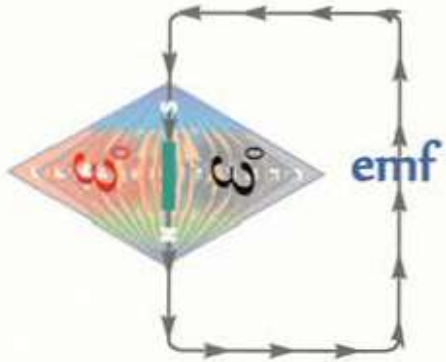
$\mathcal{E} = -\frac{d\phi_B}{dt}$

A changing Magnetic field produces a changing Electric field

The is no such entity as a purely Magnetic field [all fields are Electro-Magnetic in their geometric foundations]

inductors

All magnetic fields store neutral electrostatic potentials



permanent magnets

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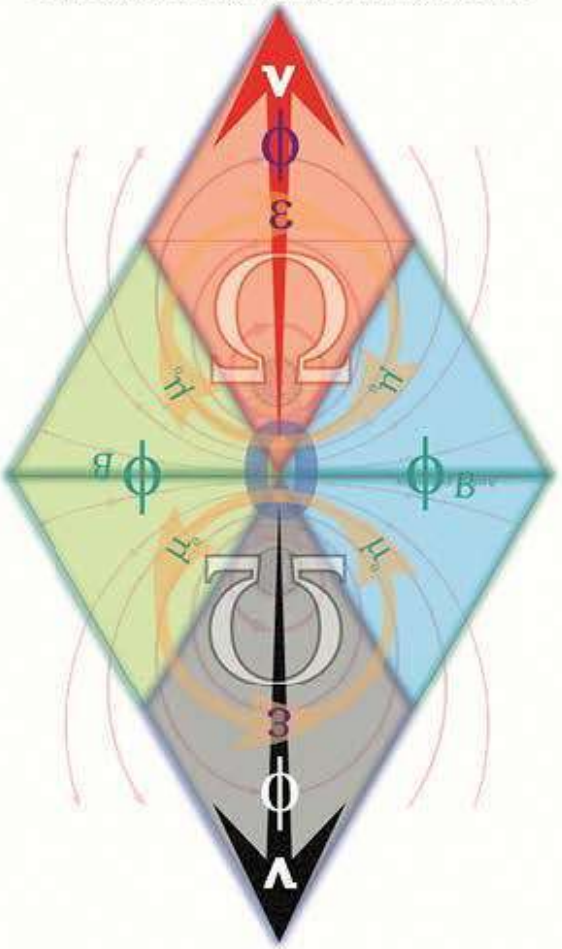
The moving magnet - conductor problem

$$B = -\frac{d\phi_\varepsilon}{dt}$$

$$\varepsilon = -\frac{d\phi_B}{dt}$$

All permanent magnets are electromagnetic fields comprised of
transverse bosons and longitudinal photons

We see two observers both moving, approaching each other.



Neutral photon field geometries produce electromotive forces as a result of the charged bosons that make them

Magnet Frame of Reference
(Moving Conductor)

Observer 2 says:

The magnet is stationary and the loop is moving toward it.
The electrons in the loop, since they are moving with the loop,
generate their own magnetic moments and experience Lorentz forces
as a result of the external magnetic field [F = q v X B],
which drives them around the loop and produces the current in the galvanometer.

There is no electric field.

Observer 1 says:

The conductive loop is stationary and the magnet is moving toward it.
The electrons in the loop are stationary and have no magnetic moments
There is a magnetic field, but it can't produce any force on
the electrons since they are stationary within the loop.

Instead, the magnetic field is changing, growing stronger as
the magnet gets closer, and this changing magnetic field
produces an electric field which causes forces on the electrons, and
drives them around the loop producing the current in the galvanometer.

Conductor Frame of Reference
(Moving Magnet)

Charged boson field geometries contain equilateral energy momenta with transverse magnetic dipoles

Special relativity postulates that electric fields in one reference frame become magnetic fields in another frame

Tetryonic theory shows geometrically that the Electric and Magnetic fields are discrete, invariant geometries resulting from the equilateral 'inductive' mass-energy [Planck quanta] geometries that comprise all EM fields.
It is the relative motion of these geometries wrt a conductor that creates changing E&M field flux strengths in turn producing an emf.
When there is no relative motion in either the EM field or the conductor, no emf is produced

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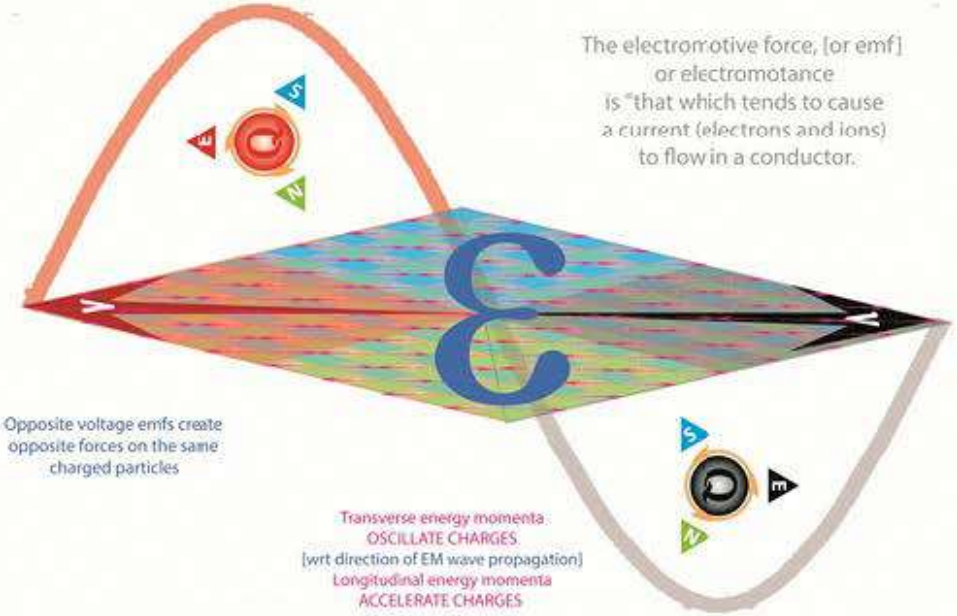
The Electromotive Force

"A source of emf can be thought of as a kind of charge pump that acts to move a charge from a point of low potential through its interior to a point of high potential. ...

The emf of the source is defined as the work done per charge dq: = dW/dq."

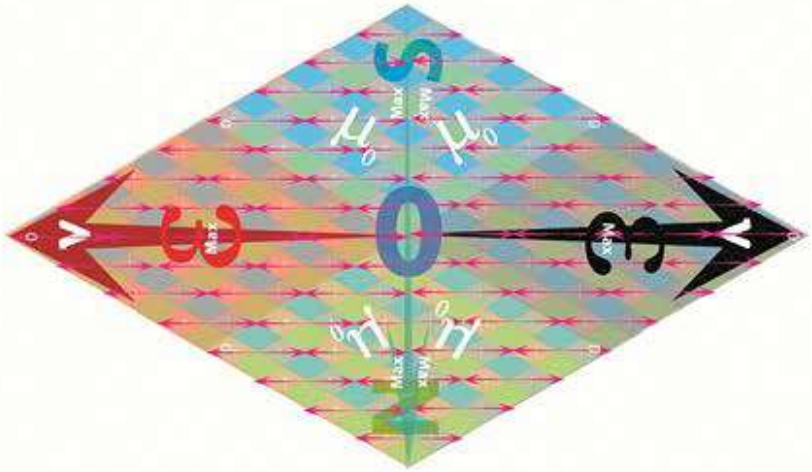
The electromotive force, [or emf] or electromotance is "that which tends to cause a current (electrons and ions) to flow in a conductor.



Opposite voltage emfs create opposite forces on the same charged particles

Transverse energy momenta OSCILLATE CHARGES [wrt direction of EM wave propagation]
Longitudinal energy momenta ACCELERATE CHARGES

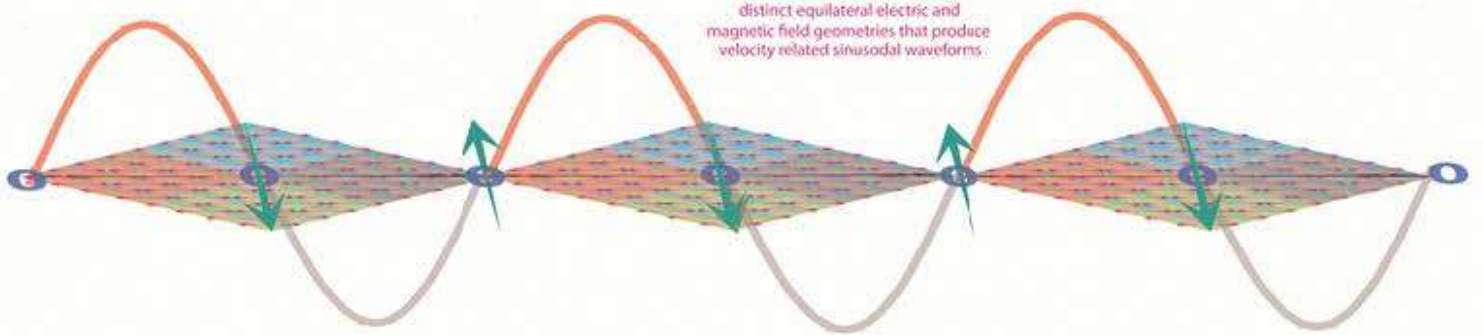
Opposite charged particles experience opposing forces due to the emf



THe magneto-static fields of all Magnets are comprised of electromagnetic fields of discrete Planck energy momenta quanta, which in turn are capable of accelerating charged particles

All ElectroMagnetic fields have distinct equilateral electric and magnetic field geometries that produce velocity related sinusodal waveforms

$$B = -\frac{d\phi_\varepsilon}{dt}$$

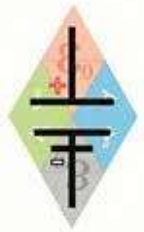


$$\varepsilon = -\frac{d\phi_B}{dt}$$

Charged boson field geometries can be viewed as transverse quantum capacitors

Lenz's law:
"The emf induced in an electric circuit always acts in such a direction that the current it drives around the circuit opposes the change in magnetic flux which produces the emf."

Neutral photon field geometries can be viewed as longitudinal quantum batteries



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The Moving Magnet problem

An electromotive Force results from the motion of a conductor relative to a magnetic field

A Magnet is really an electrostatic store of neutralised emf potential differences [creating an orthagona Magnetic moment]

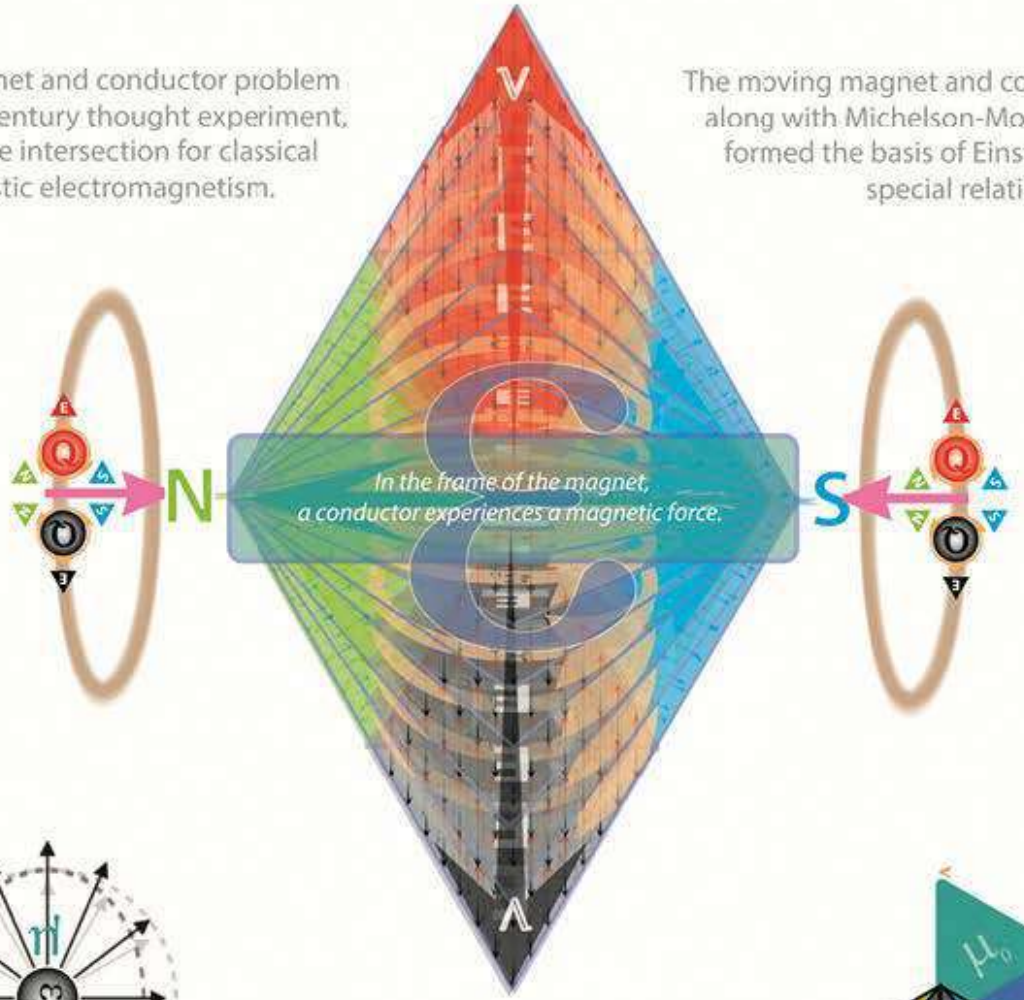
The moving magnet and conductor problem is a famous 19th century thought experiment, and provides the intersection for classical and relativistic electromagnetism.

The moving magnet and conductor problem, along with Michelson-Morley experiment, formed the basis of Einstein's theory of special relativity.

Relativistic theory explanation

In the frame of a conductor moving relative to the magnet, the conductor experiences a force due to an electric field.

A Magnetic field is an Electric field viewed in a differing inertial frame



Tetryonic theory explanation

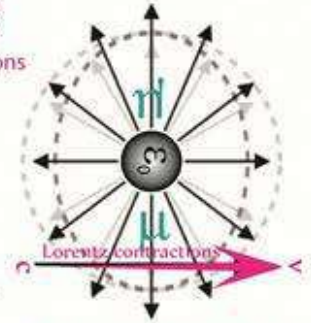
The conductor moves through continuously changing electric and magnetic field geometries experiencing sinuodal E/M forces that are directly related to each other at all times

Electric and Magnetic fields are discrete geometrically related energies

SR requires that all observers in inertial frames arrive at the same form for Maxwell's equations

SR seeks to modify space and time in a manner such that the forces and fields transform consistently.

producing expressions that differ from Newton's law of motion by a factor of γ



the relativistic distortion of accelerating spherical point charges creates magnetic moments

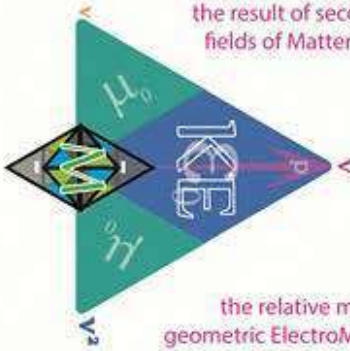
Electrostatic particles have no magnetic moment

$$\vec{F} = q\vec{E} + q\vec{v} \times \vec{B}$$

Electric force *Magnetic force*

Once in motion it posseses a magnetic moment and kinetic energies and is subject to Lorentz forces when it moves throuhg an external EM field

magnetic moments are the result of secondary KEM fields of Matter in motion



Lorentz corrections only all to KEM field mass-energies

the relative motion of geometric ElectroMagnetic fields creates changing EM forces

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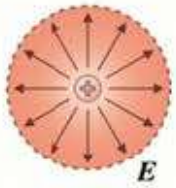
rest mass-Matter



v=0

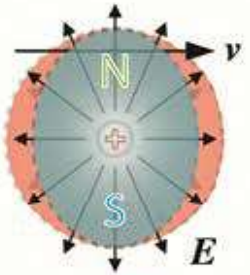
Einstein's Error of perception

In its rest frame the electric field of a point charge has the same strength in all directions and diverges away from the charge.

Electric fields are distorted due to relativistic speed effects to create Magnetic fields
The faster the velocity the greater the Magnetic field
At rest the Magnetic field becomes an Electric field

What led me more or less directly to the special theory of relativity was the conviction that the electromotive force acting on a body in motion in a magnetic field was nothing else but an electric field

Albert Einstein 1953



v=.6c

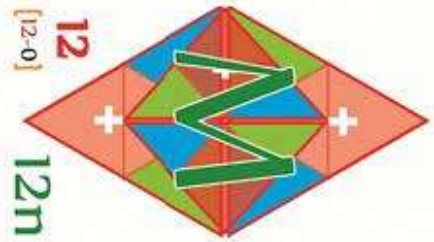
The SR theoretical model of a spherical charged body being relativisitically distorted as the the source of the Magnetic moments for charges in motion is incorrect

Lorentz velocity dependent factors relate only to Kinetic EM mass-energies of motion

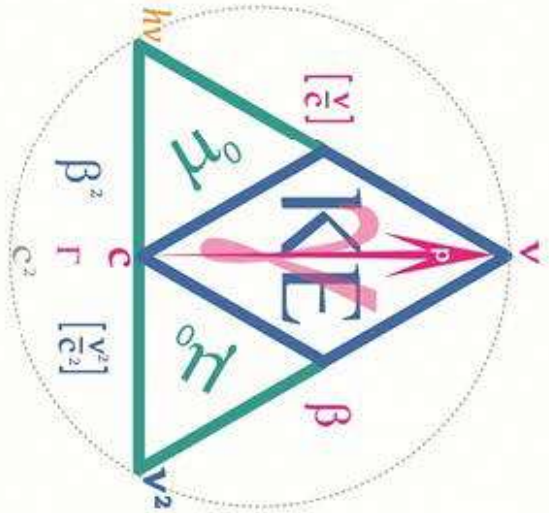
M + *It is the KEM field mass-energies that produce Magnetic moments in relativistic particles due to the motion of ElectroStatic Matter (12 + loop inductive geometries)* = RE

Stationary Leptons are 12pi charged standing waves [Matter] topologies with NO secondary Kinetic EM mass-energies geometries

Matter is Lorentz invariant

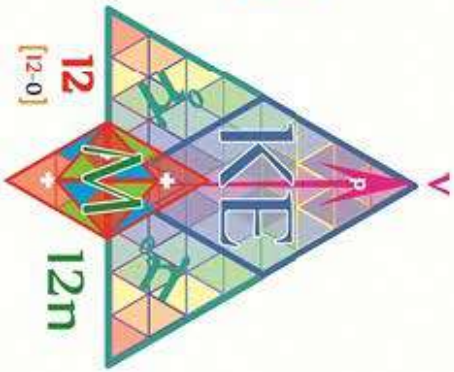


Stationary charges have Electric Fields and neutralised Magnetic fields



The speed of light in a vacuum [c] is the limit for electrically accelerated particles
Tetryonic geometry reveals it is NOT the limit of acheivable velocities

Moving Leptons are 12pi charged standing waves [Matter] topologies with Kinetic EM mass-energies geometries



Moving charges have Electric fields and Magnetic moments

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Tetryonic relativistic motion

ε_0

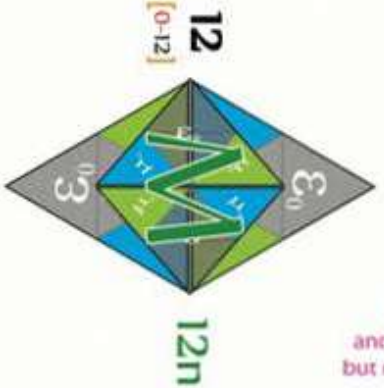
The [K]EM mass-energy content of a particle in motion is velocity dependent
its rest Matter toplogy & charge geometries are velocity invariant

μ_0 μ_1

In a frame in which the particle is at rest, we can detect only electric field

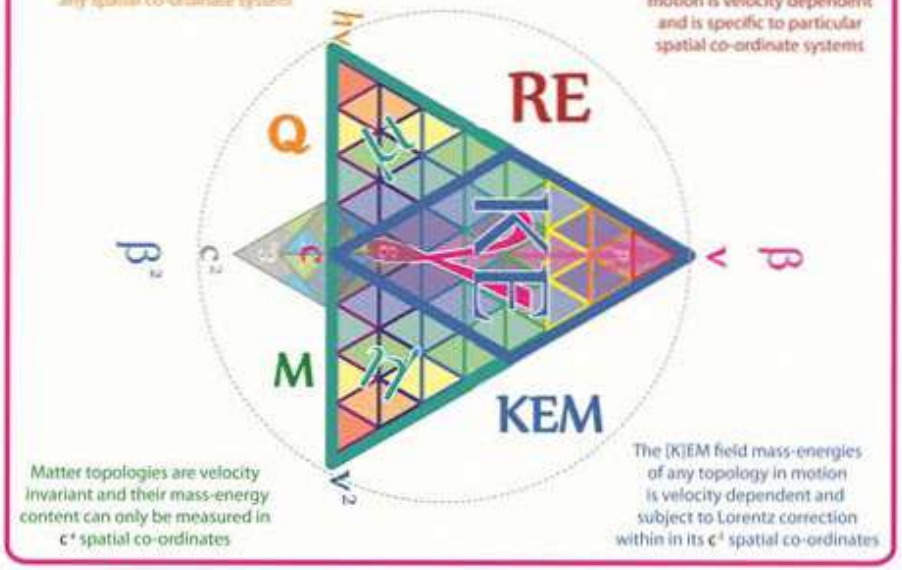
rest Matter

all Magnetic dipoles are neutral dipole pairs



Charge is a velocity invariant measure of the quantised angular momenta of any spatial co-ordinate system

The total EM mass-energy momenta of any particle in motion is velocity dependent and is specific to particular spatial co-ordinate systems



Matter topologies are velocity invariant and their mass-energy content can only be measured in c^4 spatial co-ordinates

The [K]EM field mass-energies of any topology in motion is velocity dependent and subject to Lorentz correction within in its c^4 spatial co-ordinates

It is well demonstrated that the fields of charged particles appear different in different inertial frames

In a frame in which the particle is moving, we also see a magnetic field.

rest Matter+KEM

relativistic KEM fields produce a secondary magnetic moment

$$Mv^2 = KEM = hv^2$$

Tetryonics has revealed that the Kinetic Electro-Magnetic [KEM] field of a particle in motion has a distinct geometric identity of its own rather than being the relativistic distortion of a charged EM particle

Virtual particles and action-at-a-distance are negatived by Tetryonic KEM field mass-energy momenta and the problem of simultanity is avoided because a second particle responds not directly to the first particle, but rather to the first particle's extended, velocity related [K]EM field generated by its motion at its own position.

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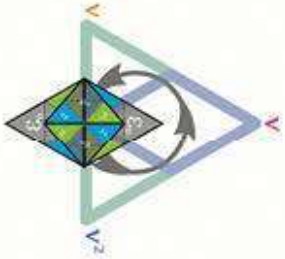
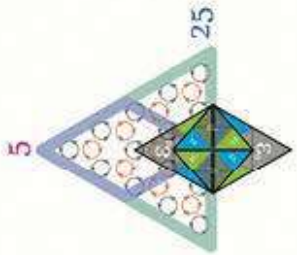
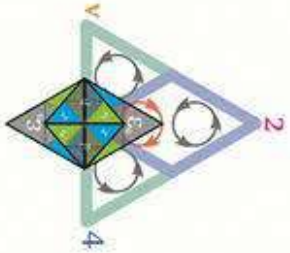
James Clerk Maxwell

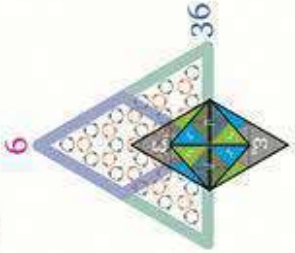
(13 June 1831 – 5 November 1879)

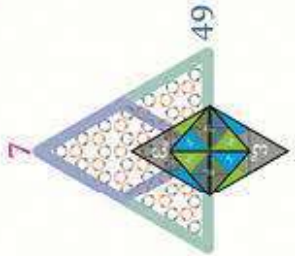
Quantum level | KEM field | KEM field | Quantum level

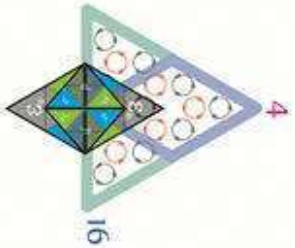


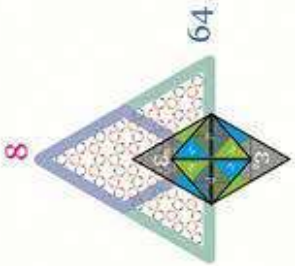


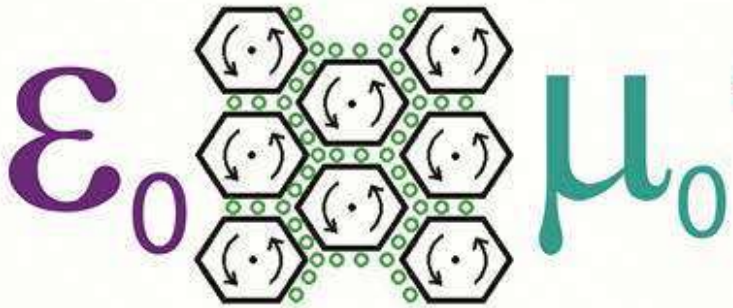












All quantum charge arrangements of EM mass-energy and force fields can be viewed as an arrangement of 'quantum idler wheels

"As early as 1857 Maxwell began to develop the idea of orienting molecular vortices along magnetic field lines, culminating in the publication of his paper 'On physical lines of force'…

He posited a honeycomb of vortices in which each vortex cell was separated from its neighbour by a layer of spherical particles, revolving in the opposite direction to the vortices.

These 'idler wheel' particles communicated the rotatory velocity of the vortices from one part of the field to another. In this ether model, the most famous image in nineteenth-century physics, the analogy provides mechanical correlates for electromagnetic quantities. The angular velocity of the vortices corresponds to the magnetic field intensity, and the translational flow of the idle wheel particles to the flow of an electric current; the field equations are based on the rotation of molecular vortices in the ether.

He emphasized that while the theory was mechanically conceivable, the model itself was provisional and temporary, even awkward, hardly 'a model of connexion existing in nature'

Equating Equilateral geometries to Quantised Angular Momentum reveals a classical mechanical model closely resembling Maxwell's hypothesised idler wheels that be be applied to any EM field of force

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Virtual Particles

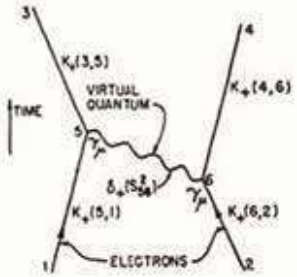
In physics, a virtual particle is a particle that exists for a limited time and space, it has become a commonplace mechanism in current Physical theories to provide a basis for the Force interactions between particles

The energy and momentum of a virtual particle are uncertain according to the uncertainty principle.

$$m^2v^4 = E^2 = p^4$$

The degree of uncertainty of each is inversely proportional to time duration (for energy) or to position span (for momentum).

Original Feymar diagram illustrating the exchange of a quantum between 2 electrons



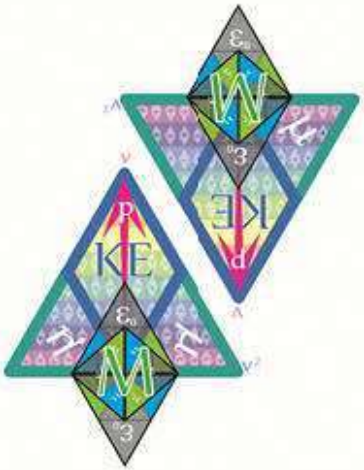
$$mv^2 = E = pv$$

Bohr understood that If you are going to try to be mechanical, you have to show some convincing mechanics.

If you can't show some convincing mechanics, you might as well dodge all mechanics from the beginning, staying with the math.

He had learned this from Maxwell, who had done the same thing 60 years earlier.

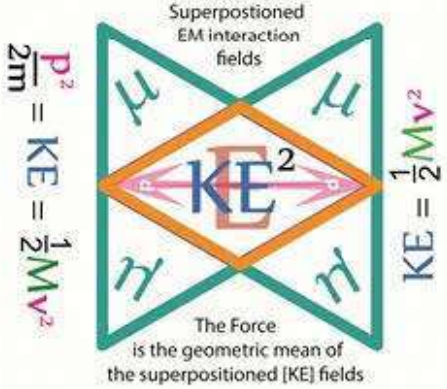
In the 1860's, Maxwell had tried to create vortices to explain the field mechanics, but, finding himself under heavy fire from Lord Kelvin and others, he decided to give it up and go to other mathematical alternatives like quaternions instead.



$m^2c^4 = E^2 - p^2c^2$

is in-correct for superpositioned 2D KEM fields the real interaction geometry is illustrated below:

$$\frac{m\Omega^2v^4}{2} = KE^2 = \frac{p^2v^2}{2}$$



The equilateral energy geometry of Tetryonics clears up this issue once and for all, virutal particles do NOT exist. The Force interactions between all Matter in relative motion is mediated by the equilateral geometries of [K]EM mass-ENERGY momenta that spread out from their source Matter through Space-time

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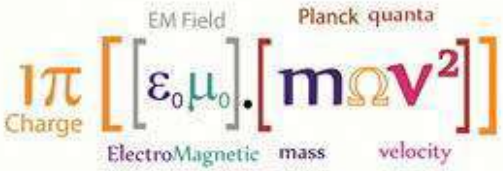
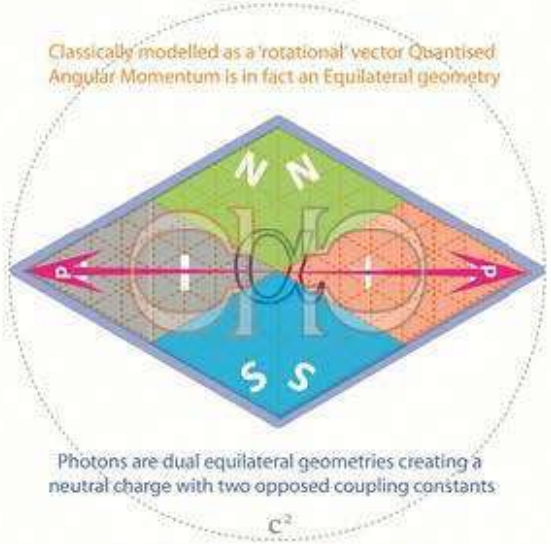
Equilateral geometry - the Hidden Constant

$$kg\ m\Omega\ \frac{m^2}{s} = h\ kg\frac{m^2}{s}$$

Quantised Angular Momenta has an equilateral geometry



Tetryonics has revealed the equilateral relationships between Charge, Planck energies and the Constants showing quantised angular momentum to be the 'hidden' geometric constant driving the physics of our Universe on all scales


Classically modelled as a 'rotational' vector Quantised Angular Momentum is in fact an Equilateral geometry
Photons are dual equilateral geometries creating a neutral charge with two opposed coupling constants
c²

Alpha is the geometric coupling constant between Magnetic and Electrical energies that acts as a scaling constant between Kinetic and Potential quantum energies

It is the source of the quantum charges of all EM mass-energy momentum & inertia

Quantised Angular Momenta creates charged EM mass-energies

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.0012

2π

.007539822

$$\alpha = \frac{e^2}{\hbar c} \qquad \alpha = \frac{e^2}{\hbar c\, 4\pi\varepsilon_0}$$

$7.297\,352\,5376(50) \times 10^{-3}$

$= \frac{1}{137.035\,999\,679}$

132.6291192^{-1}

The ALPHA Constant is the scalar coupling field of quantised energy momenta in superpositioned EM fields that facilitates Force (linear energy momenta) exchanges, resulting in the familiar Laws of Attraction/Interaction

In physics, the fine-structure constant is a fundamental physical constant, namely the coupling constant characterizing the strength of the electromagnetic interaction.

The numerical value of α is the same in all systems of units, because α is a dimensionless quantity.

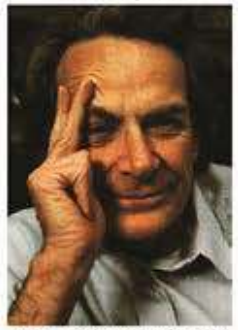
There is a most profound and beautiful question associated with the observed coupling constant, e the amplitude for a real electron to emit or absorb a real photon. It is a simple number that has been experimentally determined to be close to 0.08542455.

It has been a mystery ever since it was discovered more than fifty years ago, and all good theoretical physicists put this number up on their wall and worry about it.

Immediately you would like to know where this number for a coupling comes from: is it related to pi or perhaps to the base of natural logarithms? Nobody knows. It's one of the greatest dcmn mysteries of physics: a magic number that comes to us with no understanding by man.

We know what kind of a dance to do experimentally to measure this number very accurately, but we don't know what kind of dance to do on the computer to make this number come out, without putting it in secretly

Richard Feynman



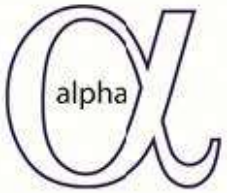
(May 11, 1918 - February 15, 1988)

equilateral energies

.0012 m²/s

Superpositioned Fields

0.007539822



Alpha coupling Constant

132.6291192^{-1}

You might say the "Hand of GOD" wrote that number, but "we don't know how HE pushed his pencil."

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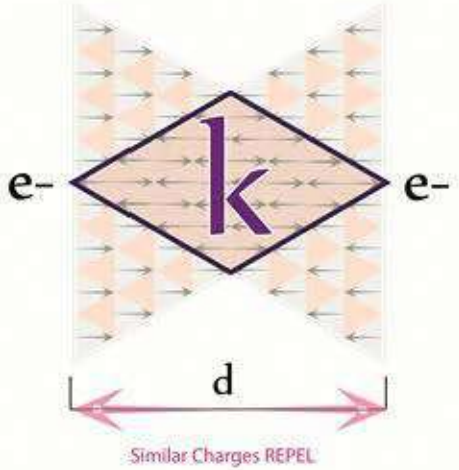
The Fine Structure Constant

$2\pi[QAM]_{.0012} = 0.007539822$

Arnold Sommerfeld introduced the fine-structure constant in 1916 as a fundamental physical constant, namely the coupling constant characterizing the strength of the electromagnetic interaction.

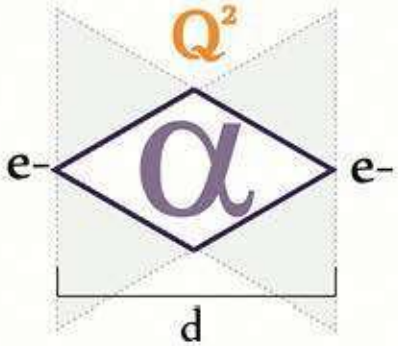
$2\pi[QAM]^{-1}_{.00119997} = 132.6291192$

In quantum electrodynamics, α is the coupling constant determining the strength of the interaction between electrons and their exchange photons



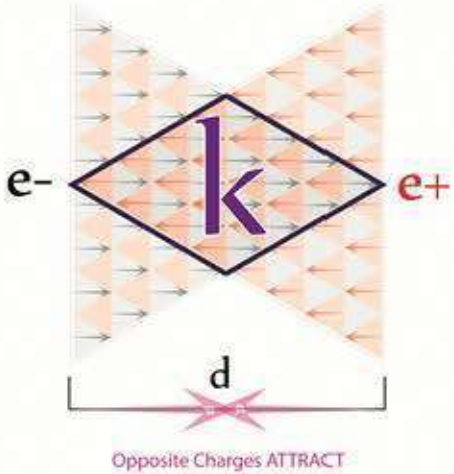
Similar Charges REPEL

10^{-6} *weak force*



It is a dimensionless quantity that has a constant numerical value in all systems of units that is the direct result of its equilateral geometry.

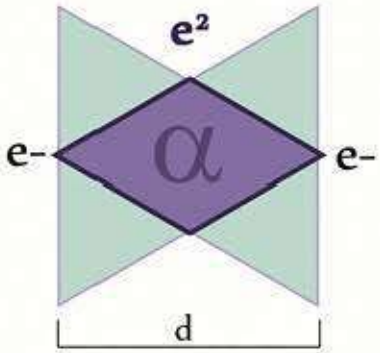
1 *strong force*



Opposite Charges ATTRACT

$\alpha = .007539822$

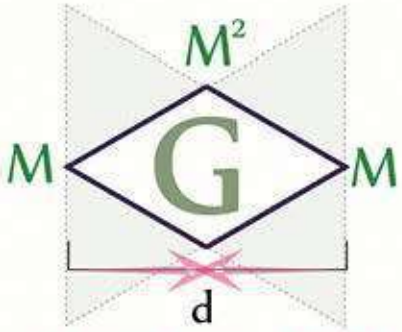
It can now be revealed to be a measure of the forces produced by, or contained in, the geometry of two superpositioned KEM [E^2] field energies



the energy needed to overcome the electrostatic repulsion between two electrons separated by a distance of d

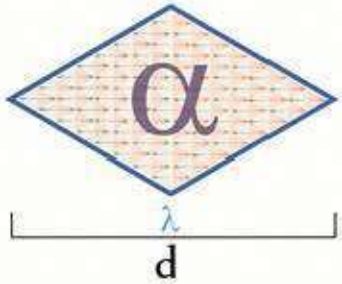
The alpha constant applies equally to the coupling of Electric and Gravitational superpositioned fields

10^{-39} *gravity*



Gravitational Matter is always ATTRACTIVE

$7.5e^{-3}$ *EM forces*



the energy of a single photon of wavelength λ that provides the energy momenta required to create a force between particles

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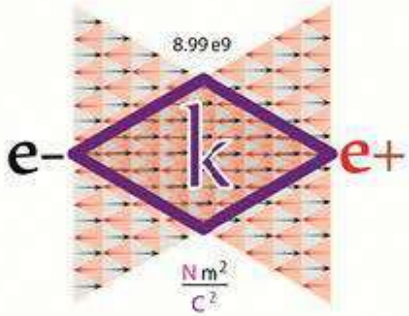
Coupling Constants

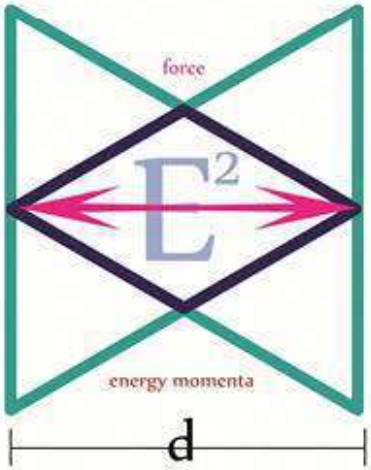
$$k\frac{Q_1 Q_2}{r^2} = F$$

Coulomb's [k], the Fine structure constant [α] and Newton's [G] are all reflections of the same coupling constant geometries differing only by the strength of their respective superpositioned energy field densities

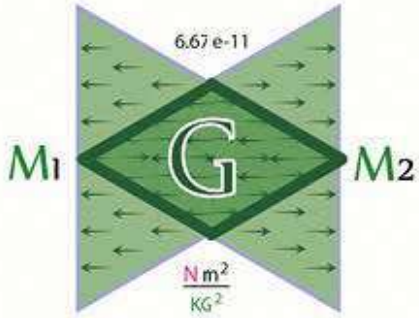
$$F = -G\frac{M_1 M_2}{r^2}$$



Coulomb's constant



Newton's constant



$$\beta = \left[\frac{v}{c}\right]$$

Linear force coupling constant

$$\beta^2 = \left[\frac{v^2}{c^2}\right]$$

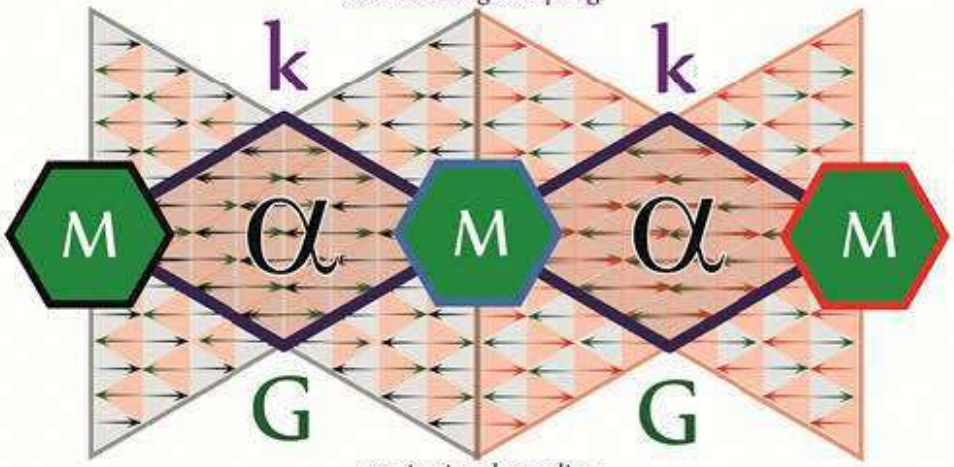
Scalar energy coupling constant

In physics, a coupling constant is a number that determines the strength of an interaction for superpositioned Electrical or Gravitational fields between material objects

Coupling Constants are dimensionless numbers

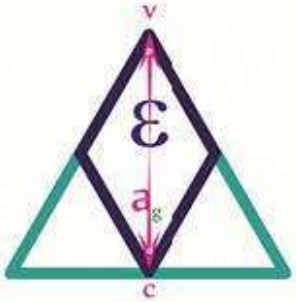
They are reflective of the linear & scalar forces produced by 2D mass-energies

electric charge coupling

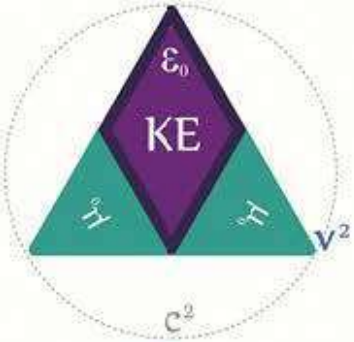


gravitational coupling

Usually the Lagrangian or the Hamiltonian of a system can be separated into a kinetic part and an interaction part. [For example, the electric charge of a particle is an Electrical coupling constant]



$$\frac{m}{s}\cdot\frac{s}{m}$$



$$\frac{m^2}{s^2}\cdot\frac{s^2}{m^2}$$

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Opposites
ATTRACT

ElectroMagnetic Charge

[the universal coupling constant]

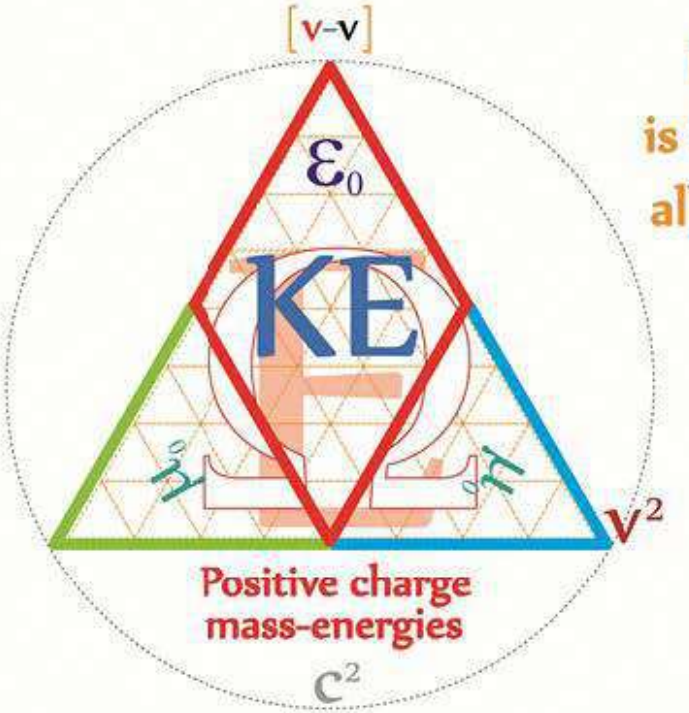
Similars
REPEL

1.33518 e-20 C

Q

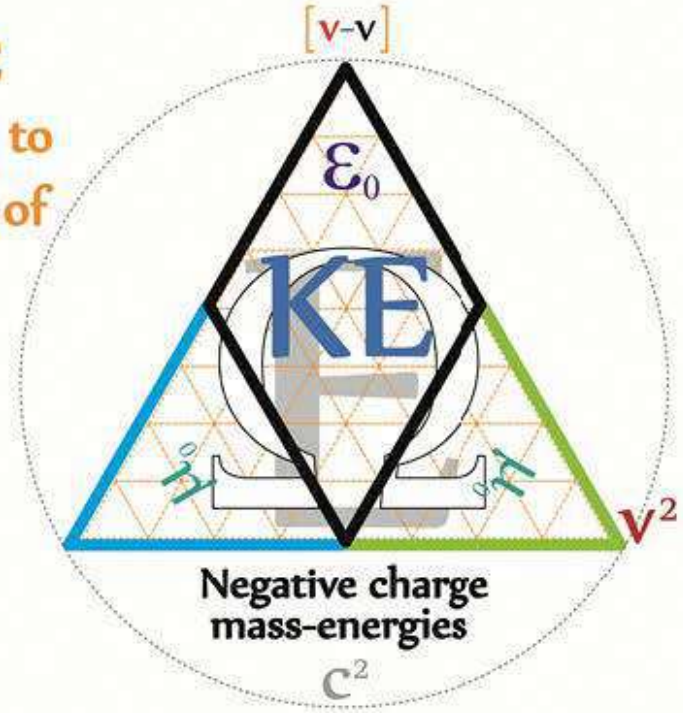
1.33518 e-20 C

Electric charge is a physical property of matter that causes it to experience a force when near other electrically charged matter.
Electric charge comes in two types, called positive and negative



ElectroMagnetic CHARGE
is the equilateral foundation to
all the quantum geometries of
mass-ENERGY-Matter

$$m\Omega v^2 / c^2$$



seconds

Changing charge geometries are equivalent to TIME in relativity

seconds

The electric charge is a fundamental conserved property of all subatomic particles, which determines their electromagnetic interaction.
The interaction between a moving charge and an electromagnetic field is the source of the electromagnetic force, which is one of the four fundamental forces

The equilateral geometry of Planck energies creates CPT symmetries in physics, and provides the foundation for all Matter geometries and their fields of interaction

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Einstein–Podolsky–Rosen paradox

was a thought experiment that attempted to challenge the Copenhagen interpretation of Quantum physics

Tetryonics provides a complete model of all Energy forms and Wave-Particle interactions, allowing a clear understanding of previously mysterious actions and processes in Quantum Mechanics

Albert Einstein

(14 March 1879 – 18 April 1955)

Showing that it is possible to know the both Position and Momenta of Particles and to model EM wave geometries and interactions in Quantum Physics

Boris Yakovlevich Podolsky

(1896–1966)

Δx Δp

Nathan Rosen

(March 22, 1909 – December 18, 1995)

The EPR experiment involved two systems that initially interact with each other and are then allowed to separate before being measured.

Measuring the Position of the Electron determines the Position of the Positron

Measuring the Momentum of the Positron determines the Momentum of the Electron

Quantum entanglement occurs when particles such as photons, electrons, etc interact physically and then become separated; this type of interaction is such that each resulting member of a pair is properly described by the same quantum mechanical state, which is indefinite in terms of important factors such as position, momentum, spin, polarization, etc

The EPR paper shows that measuring one feature of a entangled system, e.g., the momentum of one of the pair of particles, will reveal the same feature of the other particle - thus providing a mechanism for determining both the momentum and position of both particles simultaneously

Thus providing a theoretical indication that either the Uncertainty Principle was incorrect or that our understanding of Quantum Mechanics was incomplete

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Spooky interactions-at-a-distance & the transfer of information

Quantum entanglement is sasid to occur when particles such as photons, electrons, and other forms of EM mass-energies interact physically and then become separated; the type of interaction is such that each resulting member of a pair is properly described by the same quantum mechanical description (state), which is indefinite in terms of important factors such as position, momentum, spin, polarization, etc.

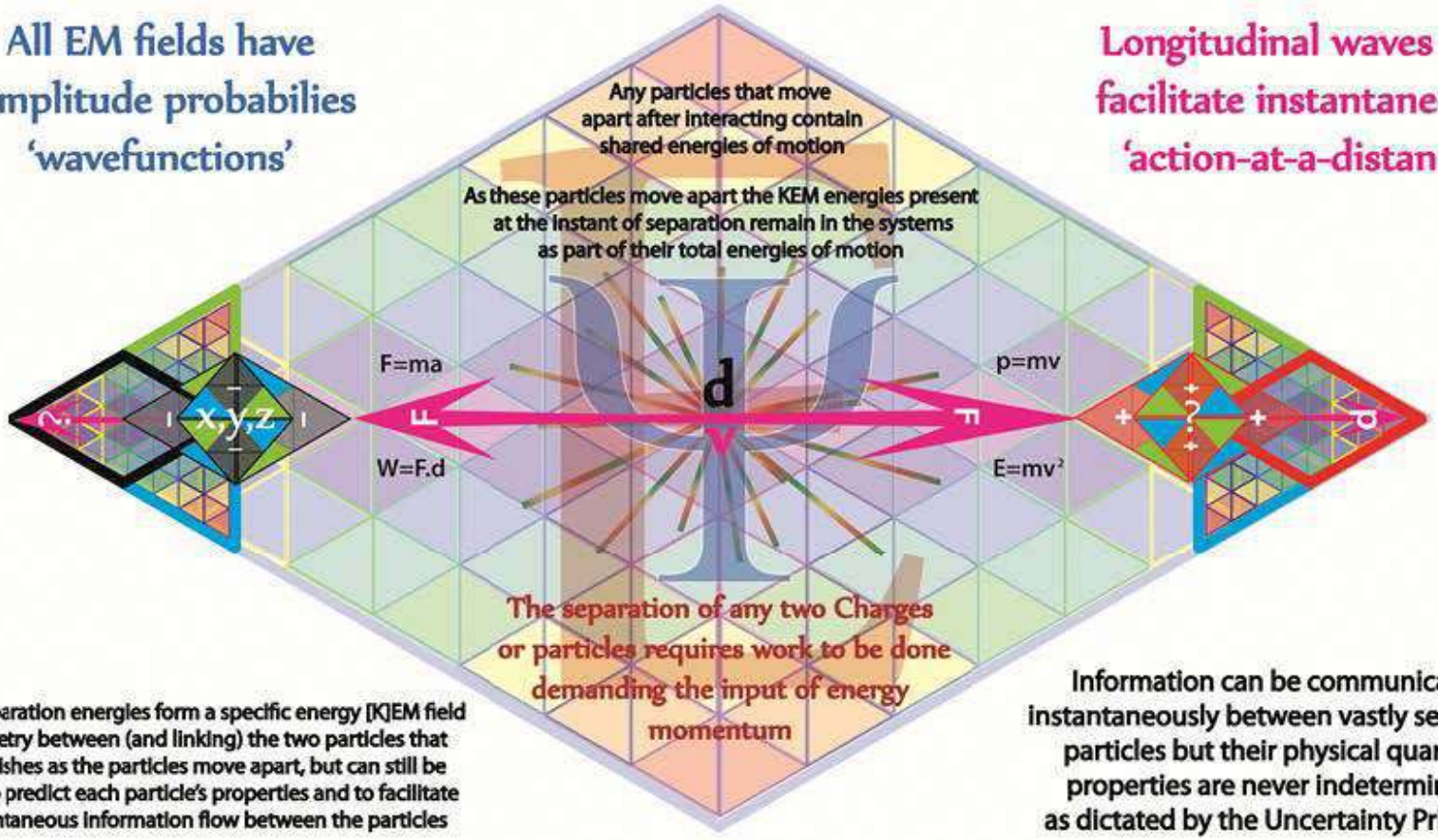
Through the equilateral geomtry of Tetryonics the mass-energy-Matter of any system of particles can be modelled in order to reveal the true EM mechanics of their quantum interactions

alice

bob

All EM fields have amplitude probabilies 'wavefunctions'

Longitudinal waves can facilitate instantaneous 'action-at-a-distance'


Any particles that move apart after interacting contain shared energies of motion
As these particles move apart the KEM energies present at the instant of separation remain in the systems as part of their total energies of motion
F=ma
W=F.d
p=mv
E=mv²
d
F
F
x,y,z
The separation of any two Charges or particles requires work to be done demanding the input of energy momentum

The separation energies form a specific energy [K]EM field geometry between (and linking) the two particles that diminishes as the particles move apart, but can still be used to predict each particle's properties and to facilitate instantaneous information flow between the particles

Information can be communicated instantaneously between vastly separated particles but their physical quantum properties are never indeterminant as dictated by the Uncertainty Principle

When two entangled particles are separated using longitudinal energies, the energy momenta of separation provides a mechanism for the establishment and near-instantaneous communication of the physical wavefunction/properties of one particle to the other, irrespective of the spatial or temporal [space-time] separation of the two 'entangled' partner particles

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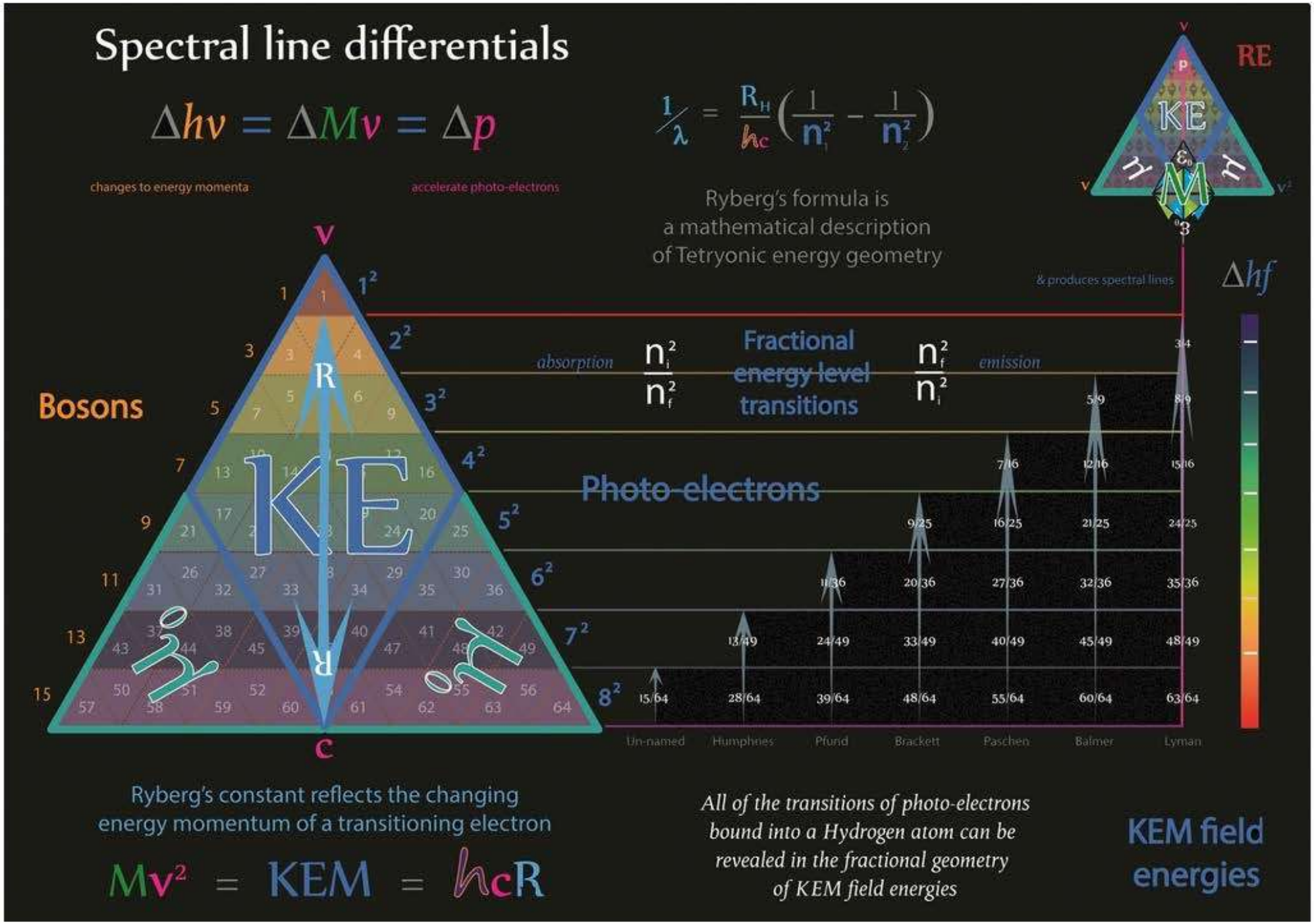

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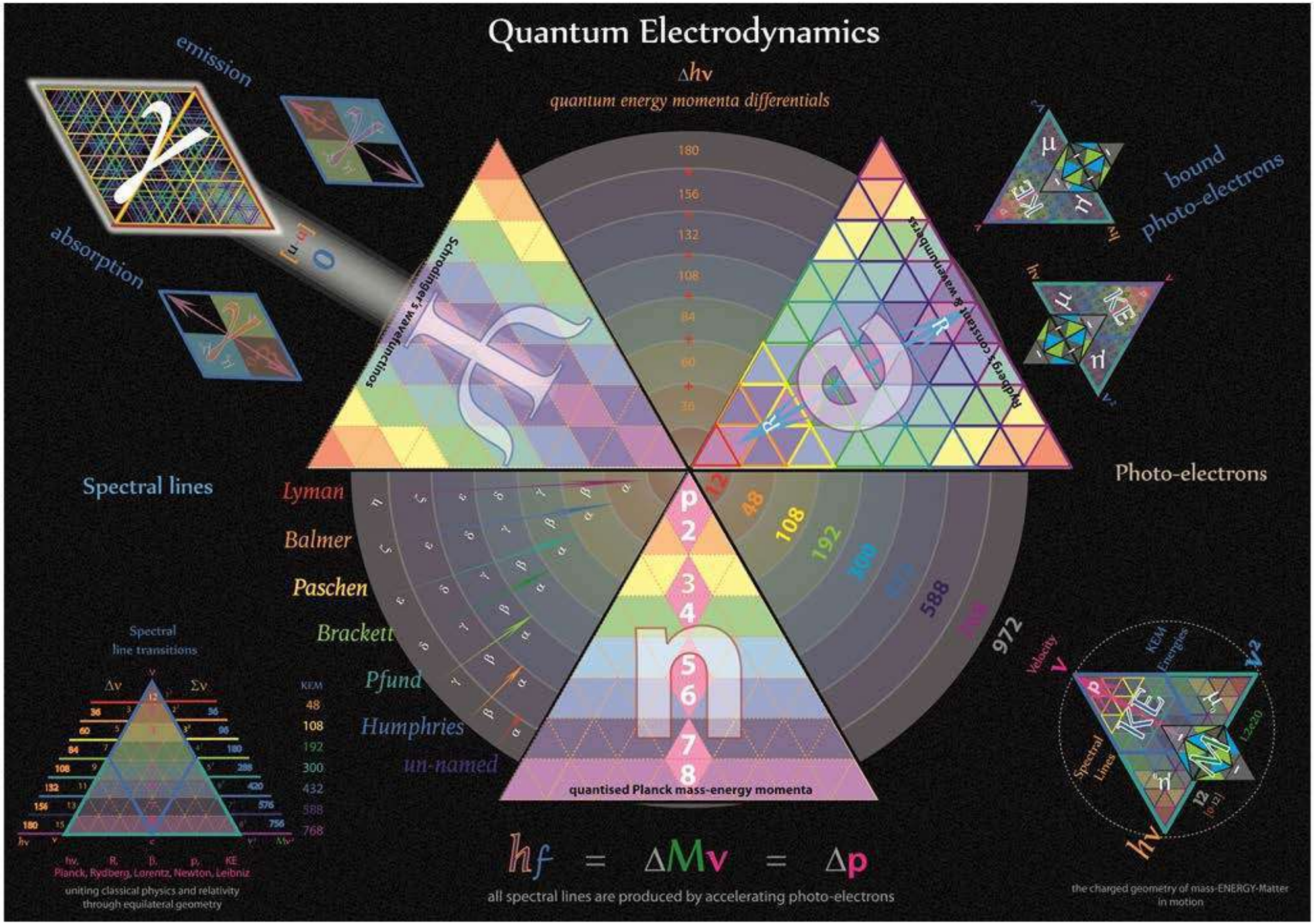

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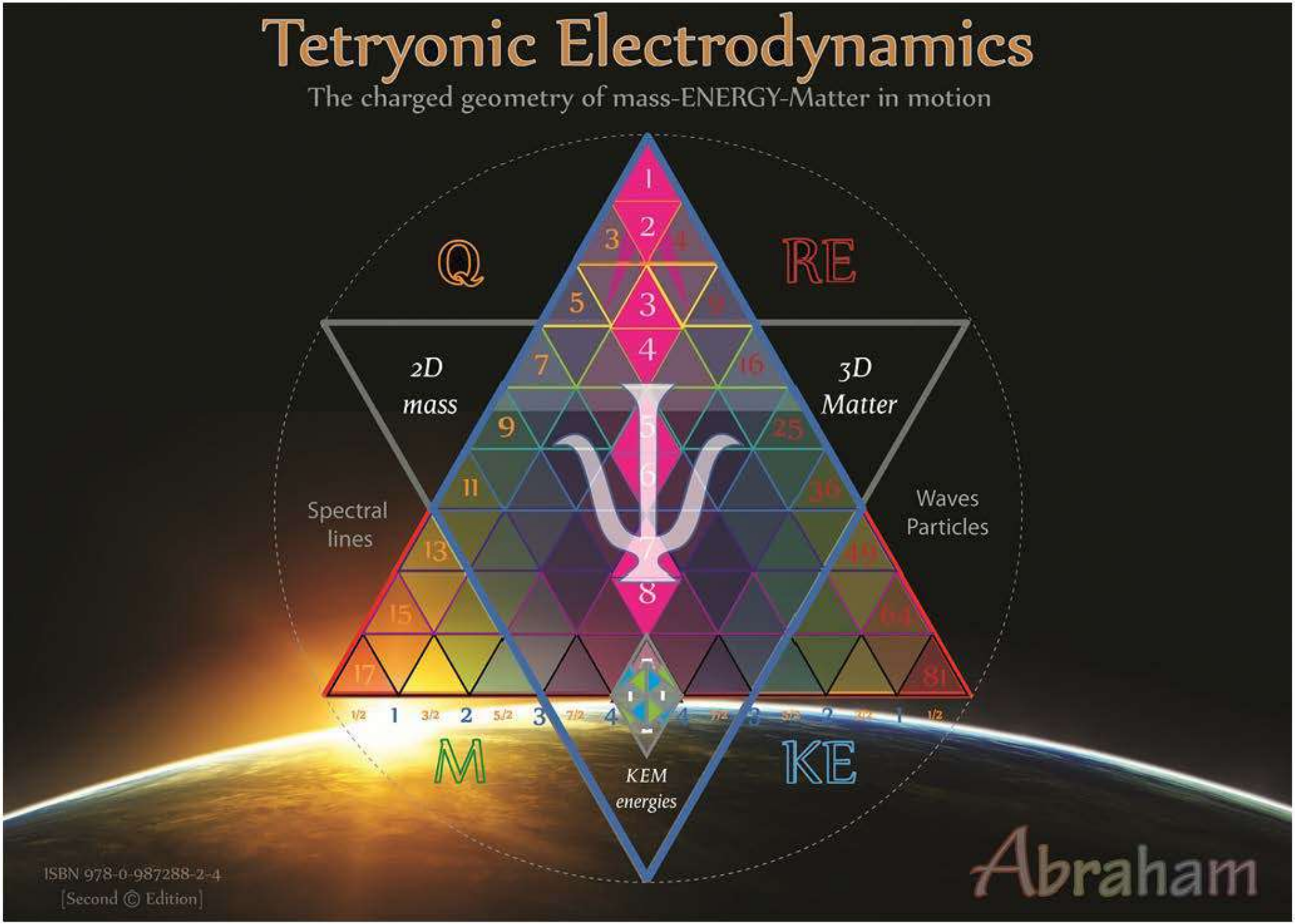

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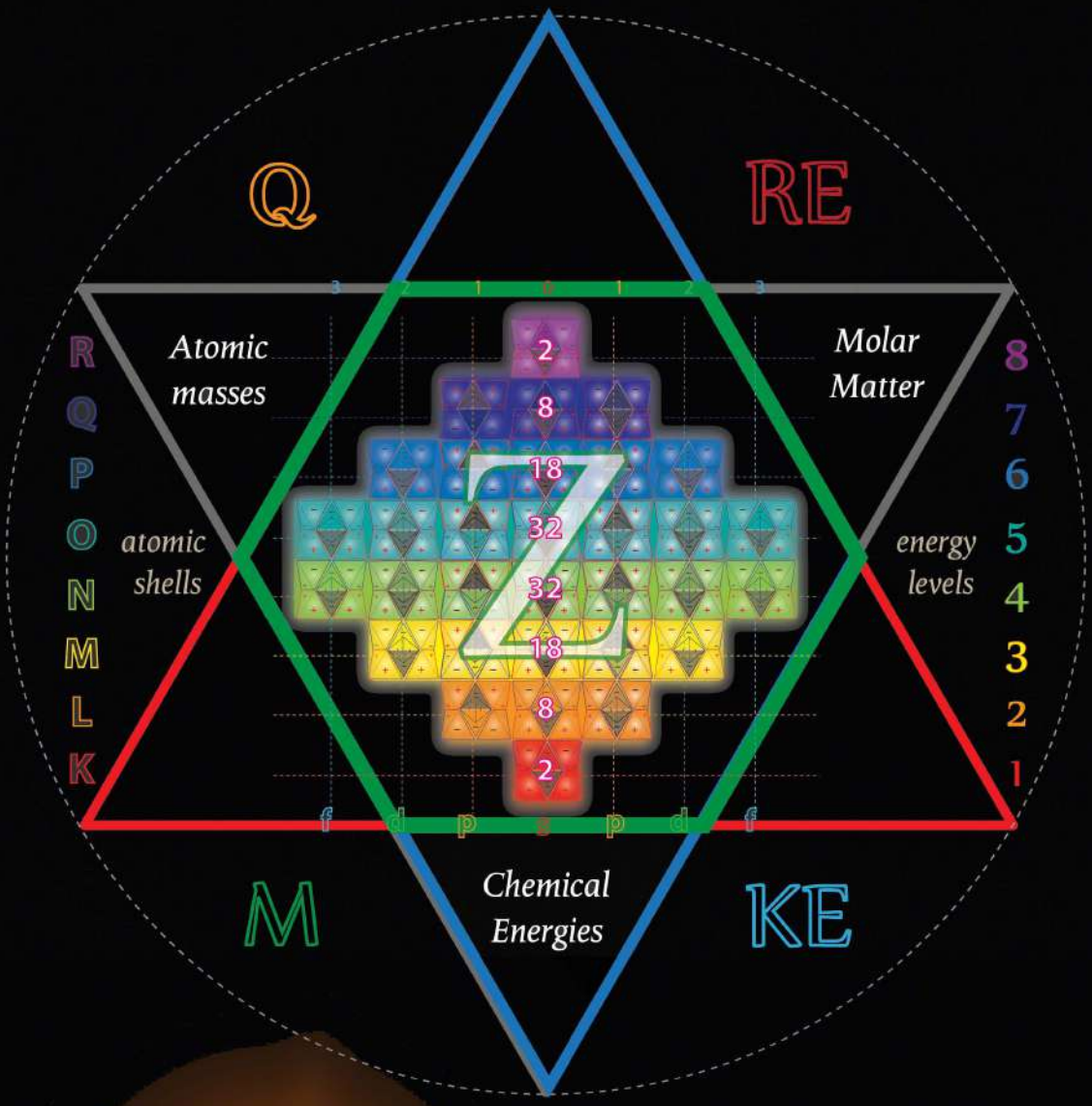
TETRYONICS

The charged topology of periodic & compound Matter



Foundational Quantum Chemistry

Abraham

ISBN 978-0-987288-3-1

[Second Edition © 2012]

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Residual Electro-Magnetic Forces

allow Neutrons and Protons to attract via the opposite Electric charge points created by their constituent Quarks in order to create Elementary Nuclei

Protons + Neutrons

u+d+u d+u+d

All electrons, quarks and Baryons are made up of 4n+ (Tetryonic) standing-wave EM fields.

As well as having nett Tetryonic charged topologies ranging between [+24] ~ [-12] they all posses distinct ELECTRIC FIELDS that are concentrated in 3 apex points as indicated in the illustrations

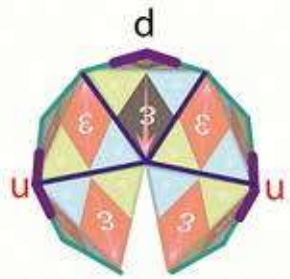
These points result from the orientation of Electric apexes and orthagonal Magnetic dipole field edges that make up each particle's externalised EM fields.

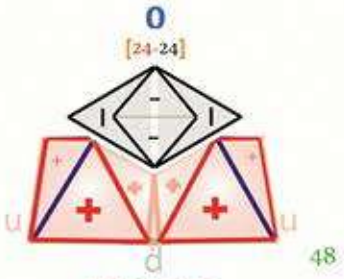
The Positive and Negative electric apex points, obey the Law of Interaction forcing separated nuceli to combine due to their individual nett Tetryonic charges and provide a means of orienting nuclei to each other to create larger particles [elements, allotropes and compounds]

External Magnetic (H) fields can interact with the integral magnetic (B) dipoles of Tetryonic particles forcing them to orientate in specific directions to facilite chemical bonding [nuclear forces]

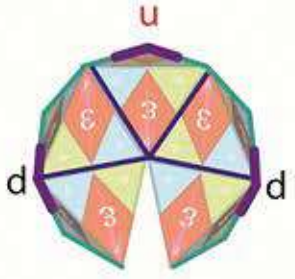
Additionally, external Electric fields can intercct with the integral electric fields attracting or repelling them depending on the polarity of the external electric field [Electrostatics]

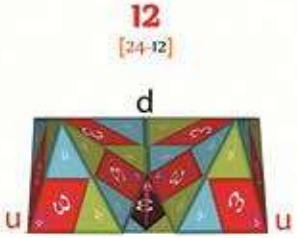
External energies can be induced into these integral EM fields via inductive coupling or the absorption of spectral photons in turn leading to an increase in the strengthes of the integral EM apexes in turn increasing the Strong Nuclear Force.

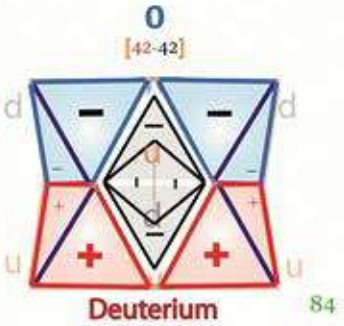




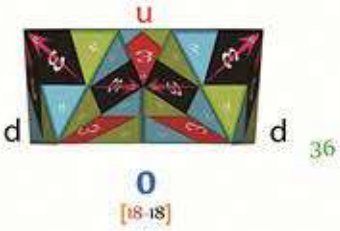
Hydrogen



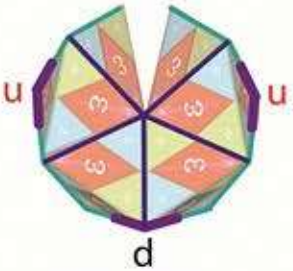




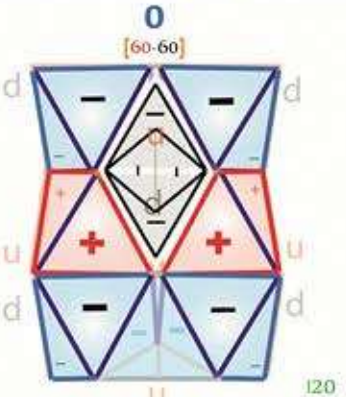
Deuterium



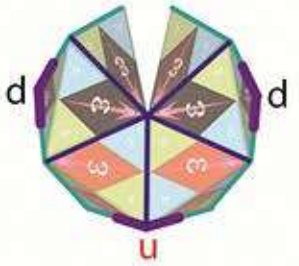
The Strong Nuclear force binds Matter together



The orientation of the component Electric fields within 3D Matter creates macroscopic force apexes via externalised 'E-points'



Tritium



The orientation of the component Magnetic fields within 3D Matter creates macroscopic force apexes via externalised 'M-dipoles'

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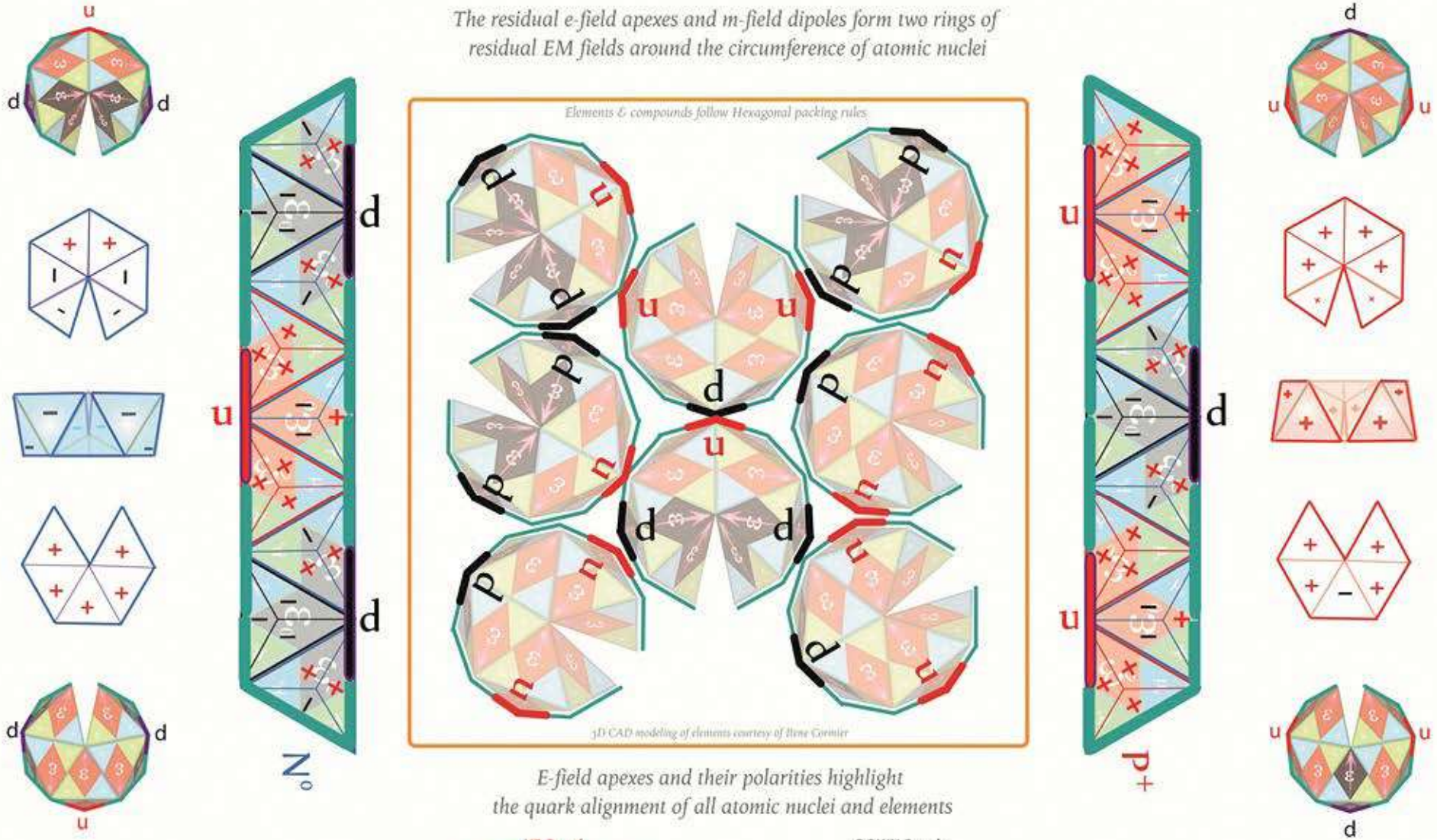
Nucleonic residual EM force

Neutrons

Protons

The attraction between Baryonic E&M field apexs, a result of their component Quark arrangements, results in the formation of heavier and more complex Nuclei

The residual e-field apexes and m-field dipoles form two rings of residual EM fields around the circumference of atomic nuclei



E-field apexes and their polarities highlight the quark alignment of all atomic nuclei and elements

UP Quark
Positive Electric field apex

DOWN Quark
Negative Electric field apex

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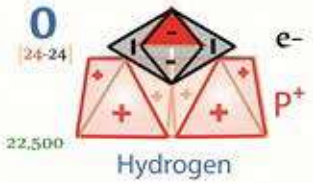
Insulators and Conductors

The position of electrons in Nuclei within Atomic Elements
results in the properties of Insulators or Conductors

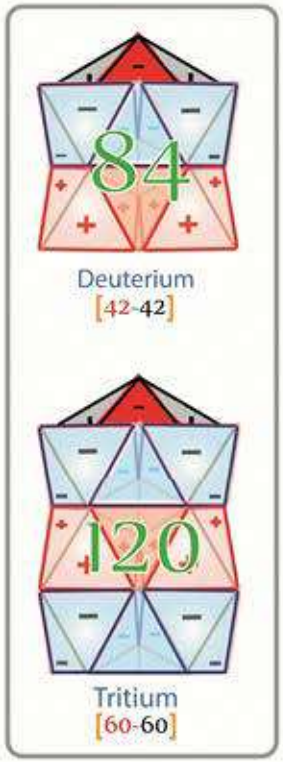


Coloumbic forces

Electrons are attracted to the residual EM net (+12) positive charge of Protons or n[+12] unbalanced Ionic charges of nuclei

Conductor

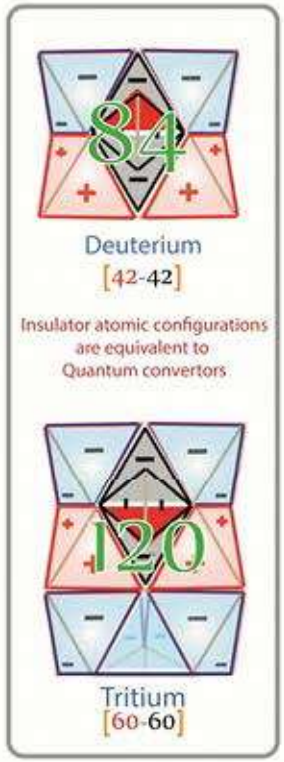
Electrical energies move around the material via boson exchanges and electron movement



≈

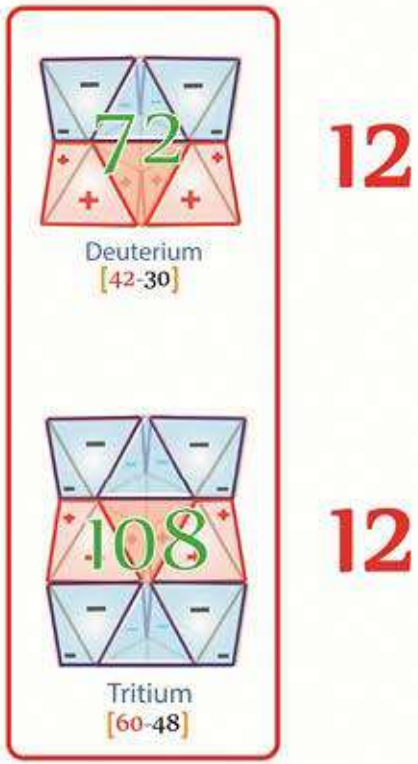
Insulator

Electrical energy is fixed within the nucleus as electrostatic charges & released upon demand via electron rotation/motion within the nucleus



Ions

Charge (energy) is moved around material via electron movement



Conductive materials contain 'free' electrons that can be readily or easily moved within the material

Insulator materials have electrons that are 'bound' tightly to the atoms and store charges locally where they are applied

Materials that have been ionised are more likely to become Conductors as they easily attract and bind free electrons to them

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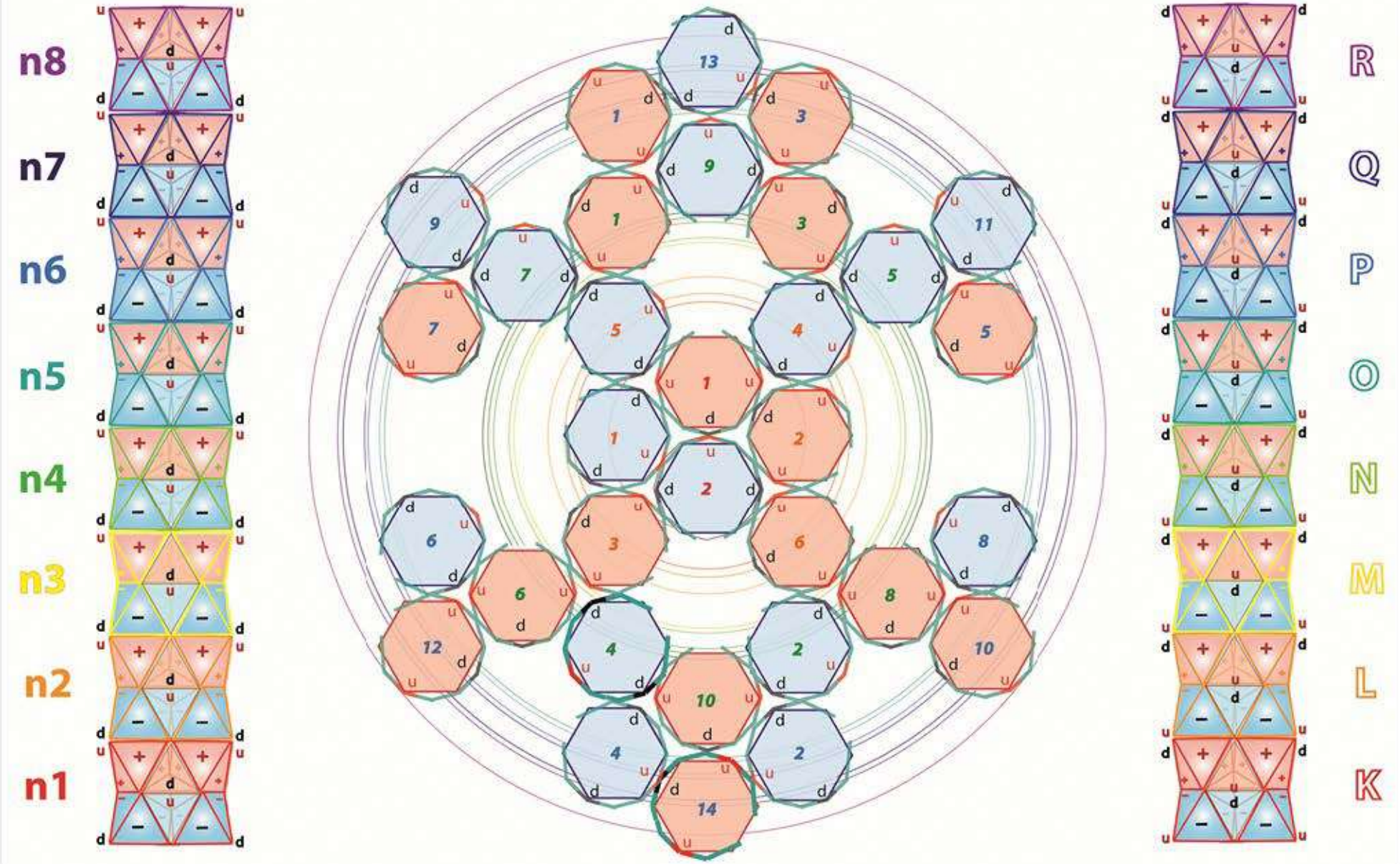
Nucleon Quark Arrangement

The nuclei arrangement of each atomic shell [quantum level] is the result of quark EM field interactions



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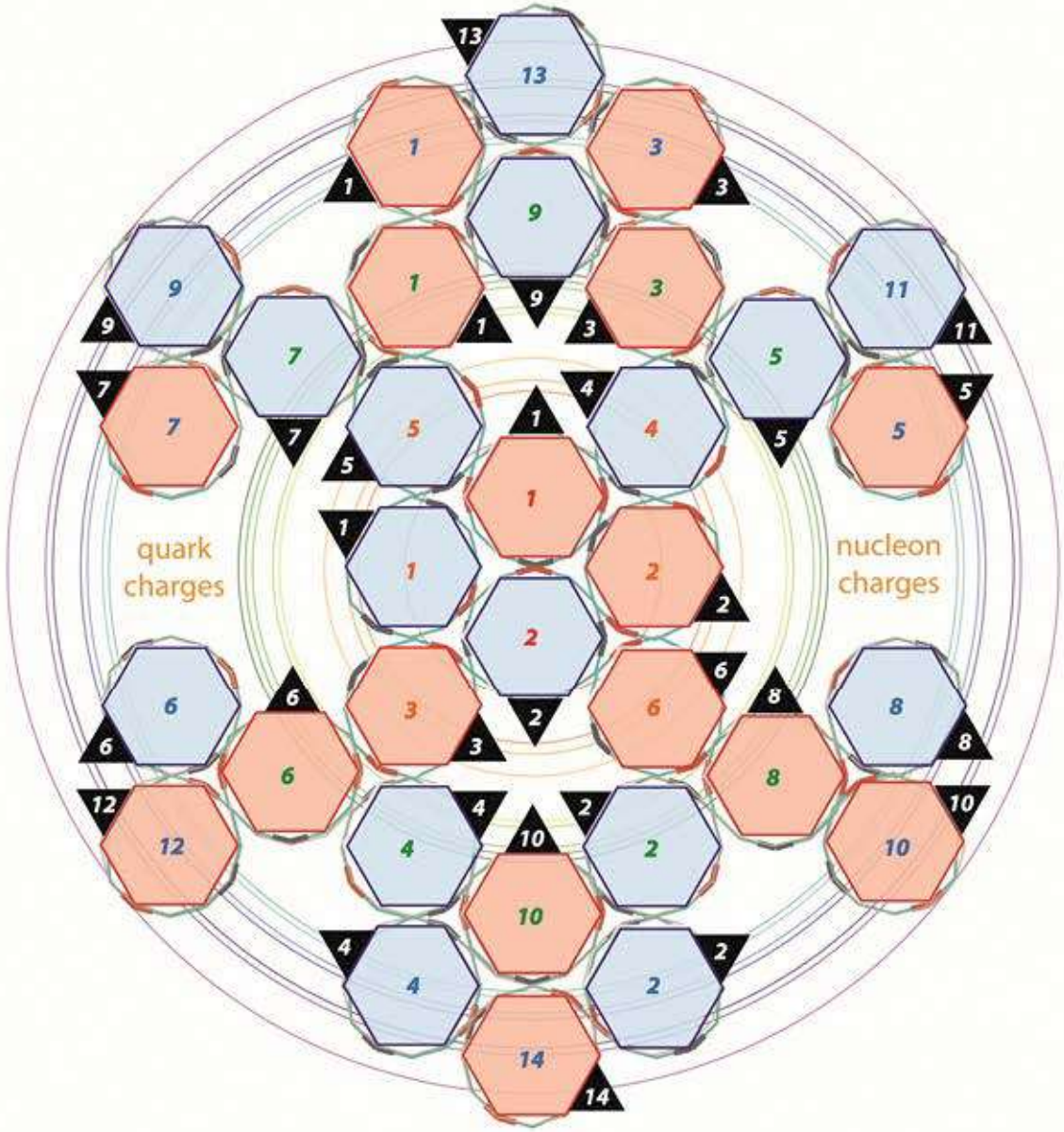
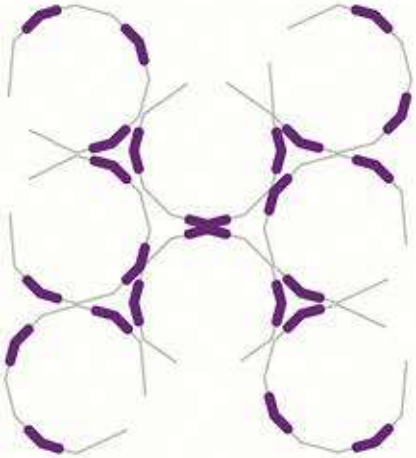
Nucleon Charges and Bonding



(Strong force - topological Electric Points)



residual EM forces

(Strong force - topological Magnetic dipoles)

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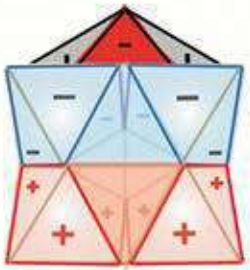
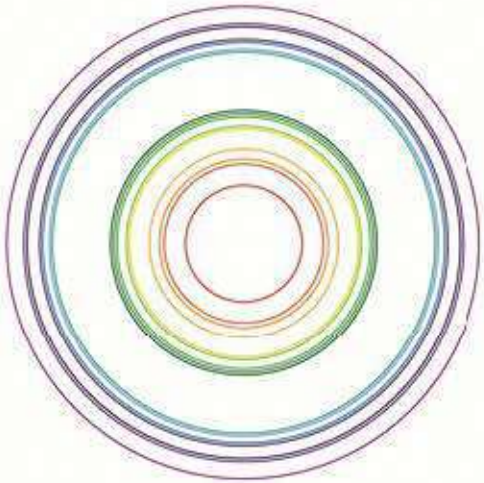
Bound electron arrangements

Externally bound electrons produce sub-orbital patterns
different to the electron orbitals of internally bound electrons



Deuterium

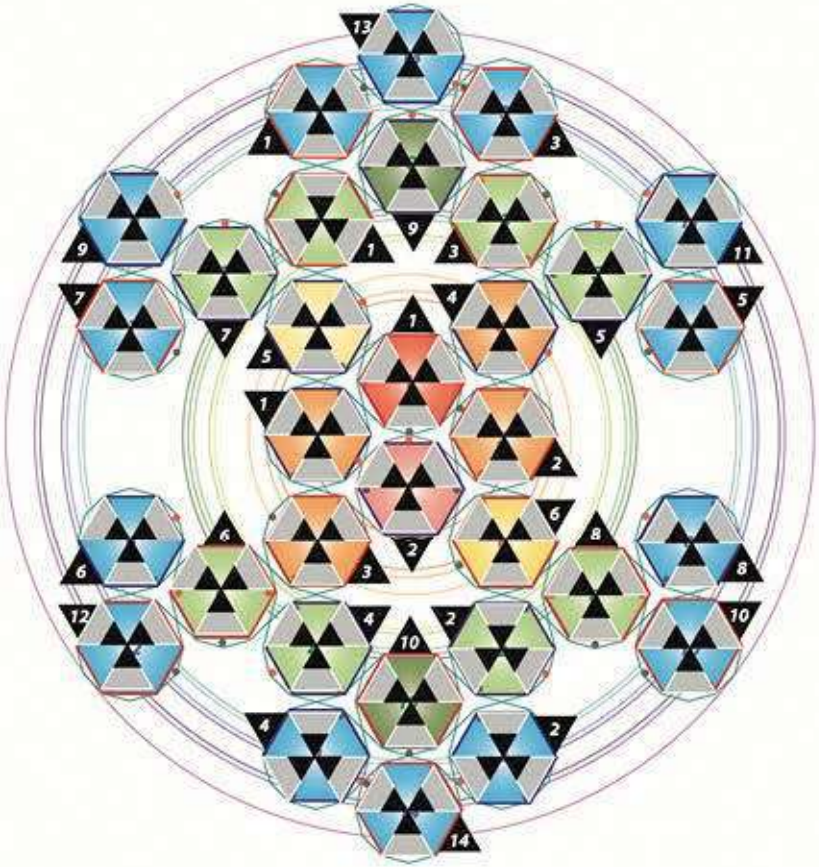
electrons are externally bound to the Deuteron nuclei



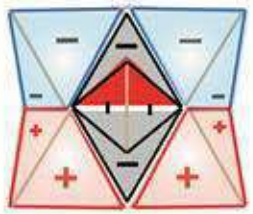
Conductors

Charges are free to move and equalise

electrons require less energy
to 'break free' from Nuclei

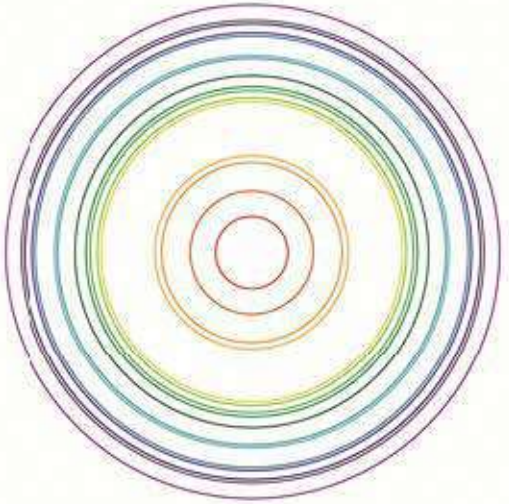


The electron orbitals of
conductors are lower energies
than those of insulators



Deuterium

electrons are internally bound in the Deuteron nuclei



Insulators

Charges are bound to specific locations

electrons require more energy
to 'break free' from Nuclei

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2D mass-energy geometries form the fabric of 3D Matter topologies

Proton

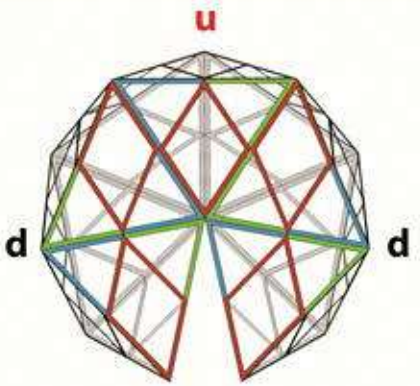
12
[24-12]

nett Charge
component charges

charged mass-energy geometry

20π

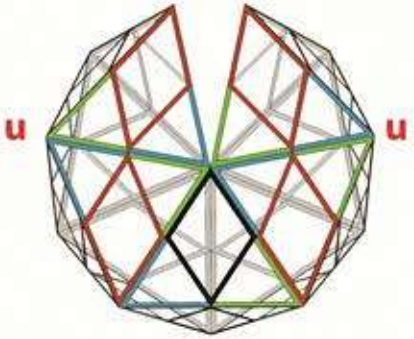
Matter topology



12
[42-30]

40π

Deuteron



nett Charge
component charges

0
[18-18]

charged mass-energy geometry

Matter topology

20π

Neutron

Charge provides the framework for the mass-energy geometry of Matter

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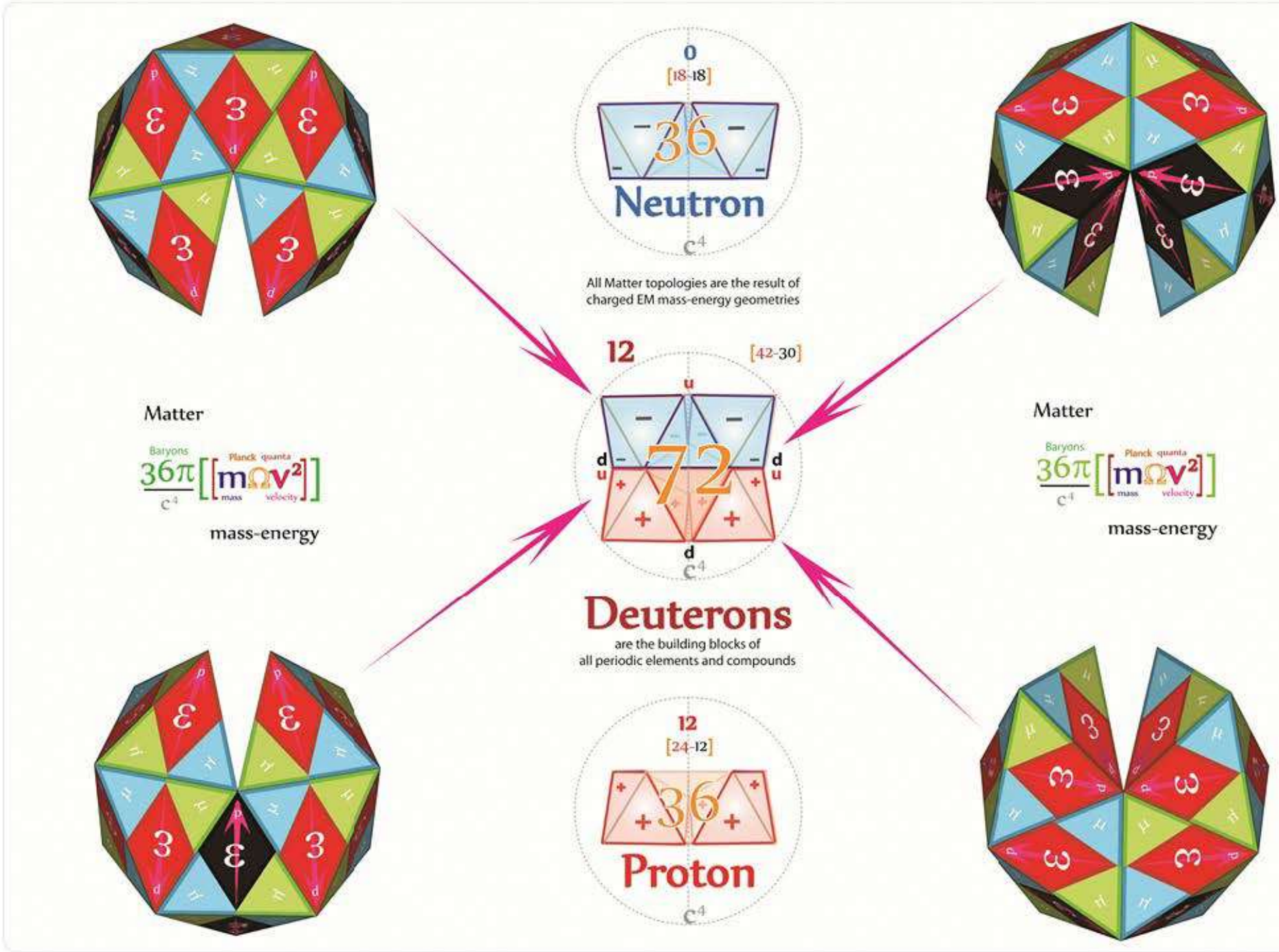

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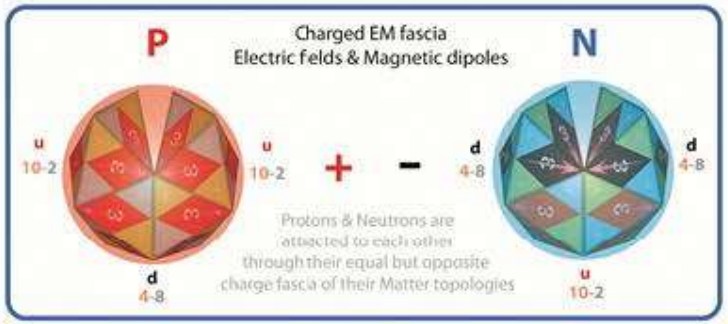
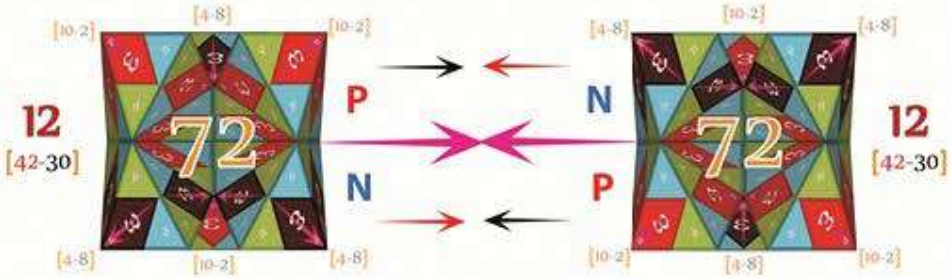
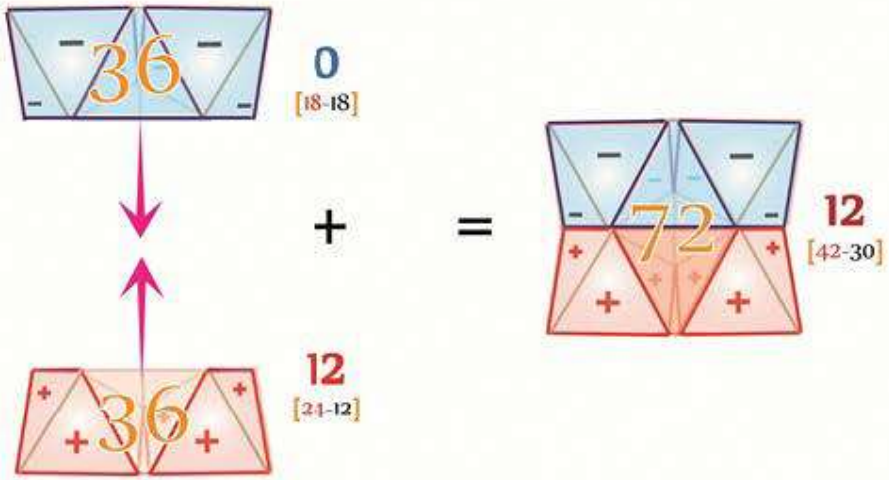
Strong Forces and Nuclear Bonding

How do Baryons with Positive and Neutral charges attract each other and bind to form stable elements ?



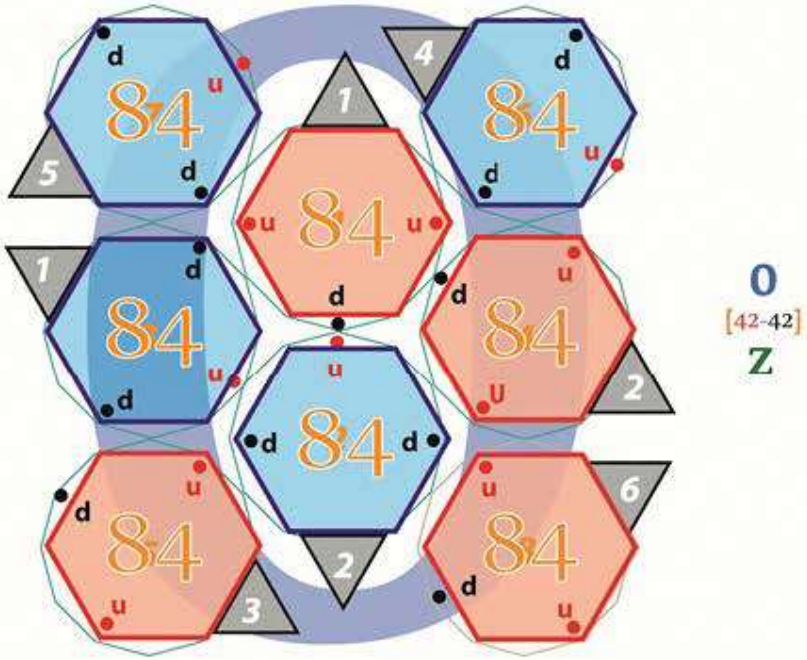


Once nuclei have been created their external electric fields & magnetic dipoles continue to attract and bind individual nuclei together via the Residual EM Force as nuclei seek charge equilibrium by combining with each other and electrons to form neutral elements



The attraction and binding of Protons and Neutrons through their electric charge imbalances creates Deuterons which have +12 charges

The residual Z[+12] charge is what attracts electrons to form neutral atomic nuclei via Coulombic attraction



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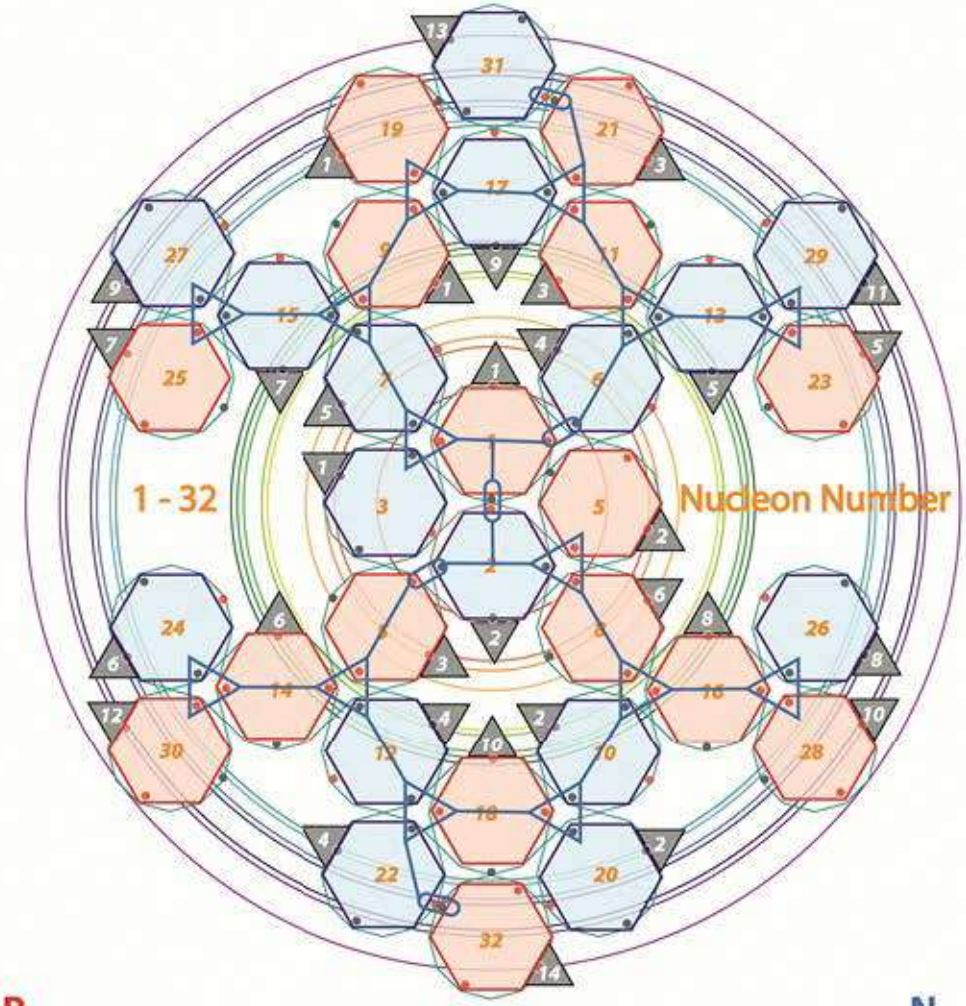
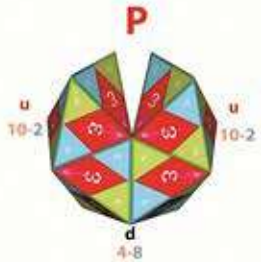
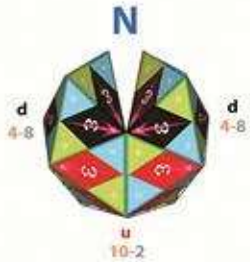
Strong Nucleonic Bonding



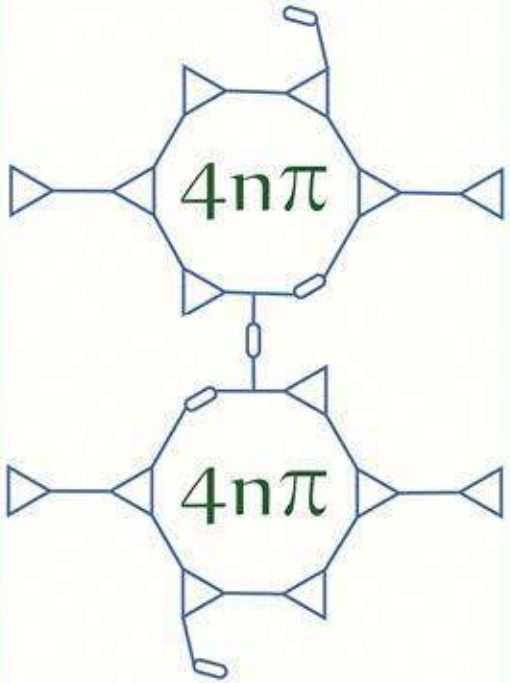


\+ In addition to the Strong colour force a separate residual binding force arises from the external apexes formed by Positive and Negative Electric points of quarks in each Baryon [nuclear-chemical bonds] −



All energy seeks equilibrium

External Electric field points bind via Charge fascia interactions with Plus and Minus Electric points combining and sharing energy throughout the resultant nuclei



Positive Electric field apex

Negative Electric field apex

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Hydrogenic vs Nucleonic electron binding

If a unbound Proton attracts an Electron
the Electron can be bound to the nuclei
in a number of differing orienations
[each with differing spin energies]

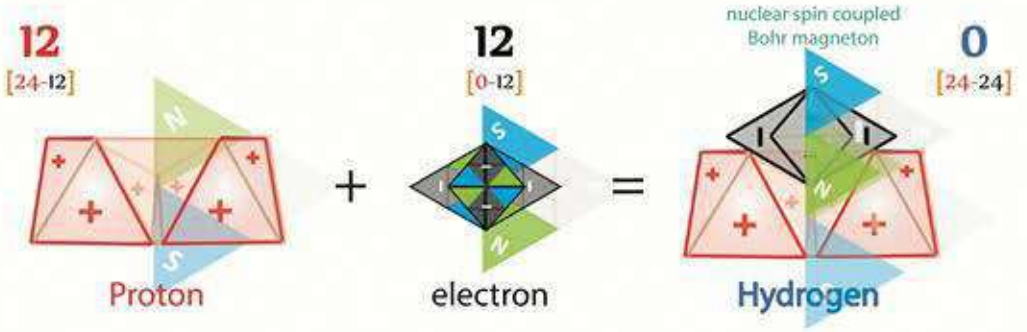
All atomic nuclei (and elements) are Deuteron'ic nuclei with a mixture of *orthagonal*, parallel and anti-paralllel spin orientations

(this is why Rydberg is less accurate for elemental nuclei compared to Hydrogenic atoms - see QM spin)

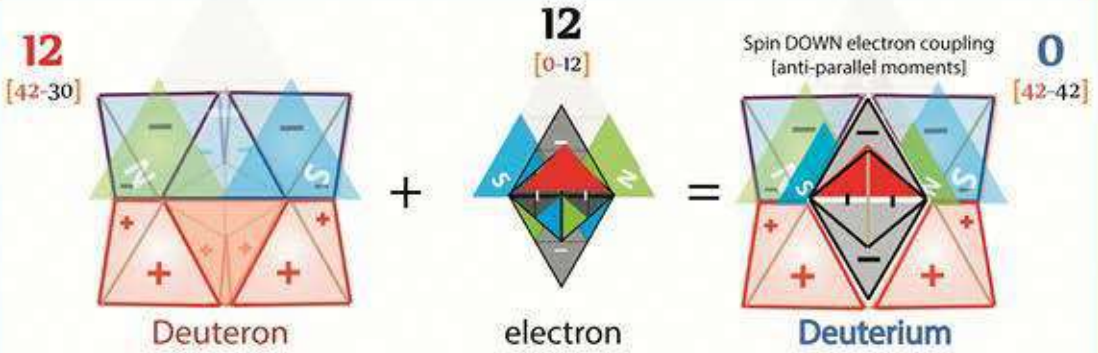
Electrons can be bound to deuteron nuclei
in four distinct orientations [2 horizontal & 2 vertical]
with each spin coupling orientation producing
differing energy electron orbitals
[wrt to the nuclear magnetic moments]

Ejecting electrons from atomic nuclei
by adding energies to their KEM fields
[the Photoelectric effect]
creates Positive Ions

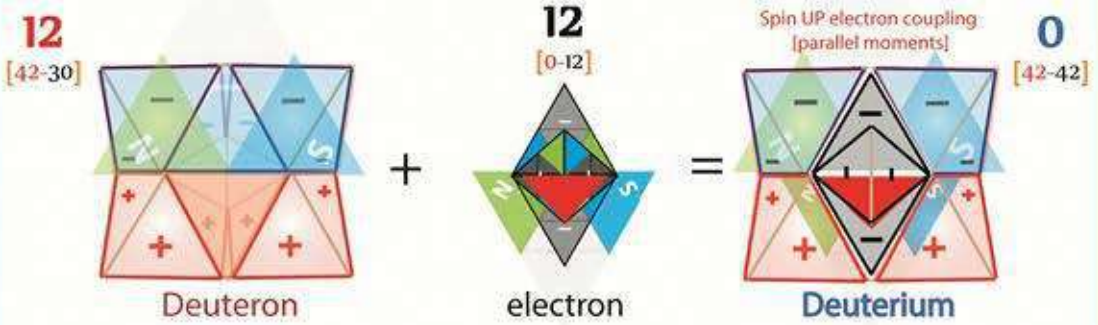
Vertically orientated electrons
within Proton-Neutron Nuclei [Deuterons]
create quantum synchronous conversor geometries



The energy levels of Baryons determines the KEM field energy of bound electrons



Bohr magnetons are always referenced wrt the Nuclear magneton



electrons produce stronger magnetic moments due to their mass-charge quotient

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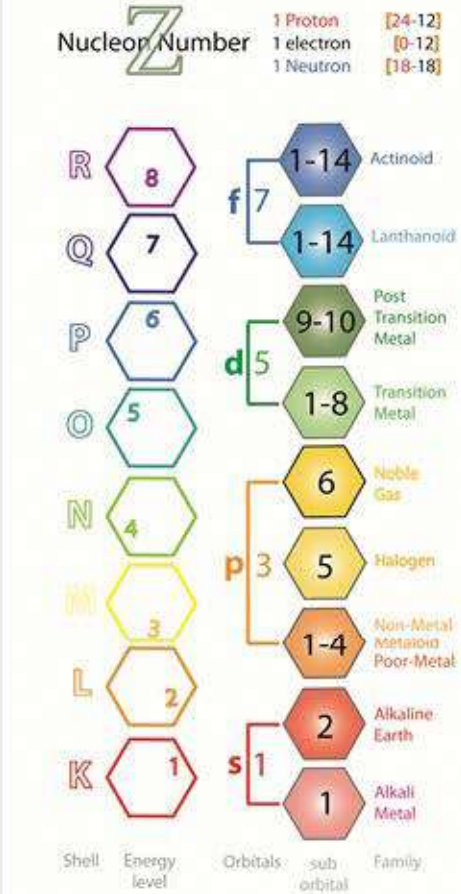
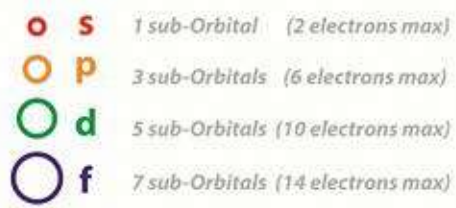
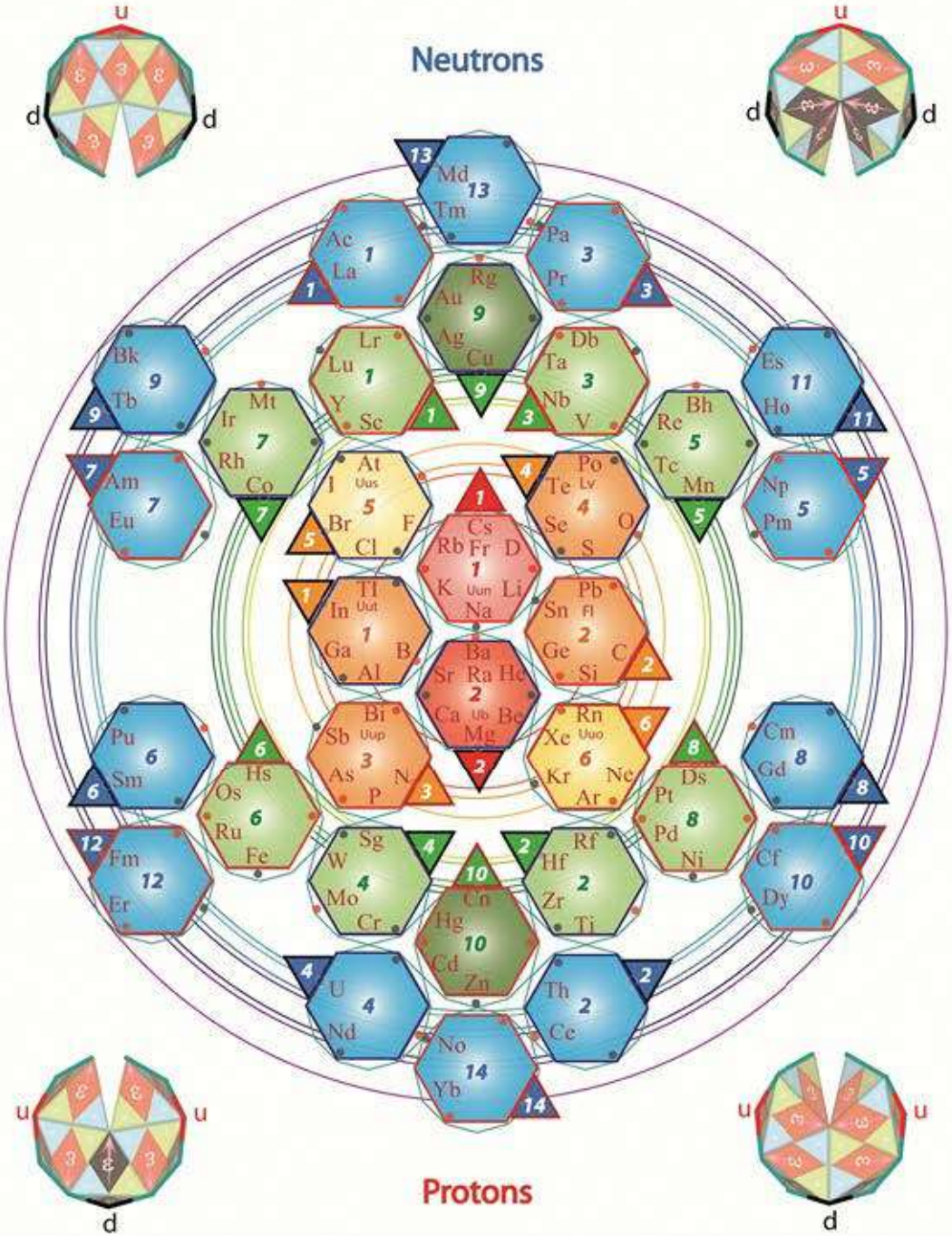
Atomic Nucleus Master Template




o s 1 sub-Orbital (2 electrons max)
p 3 sub-Orbitals (6 electrons max)
d 5 sub-Orbitals (10 electrons max)
f 7 sub-Orbitals (14 electrons max)



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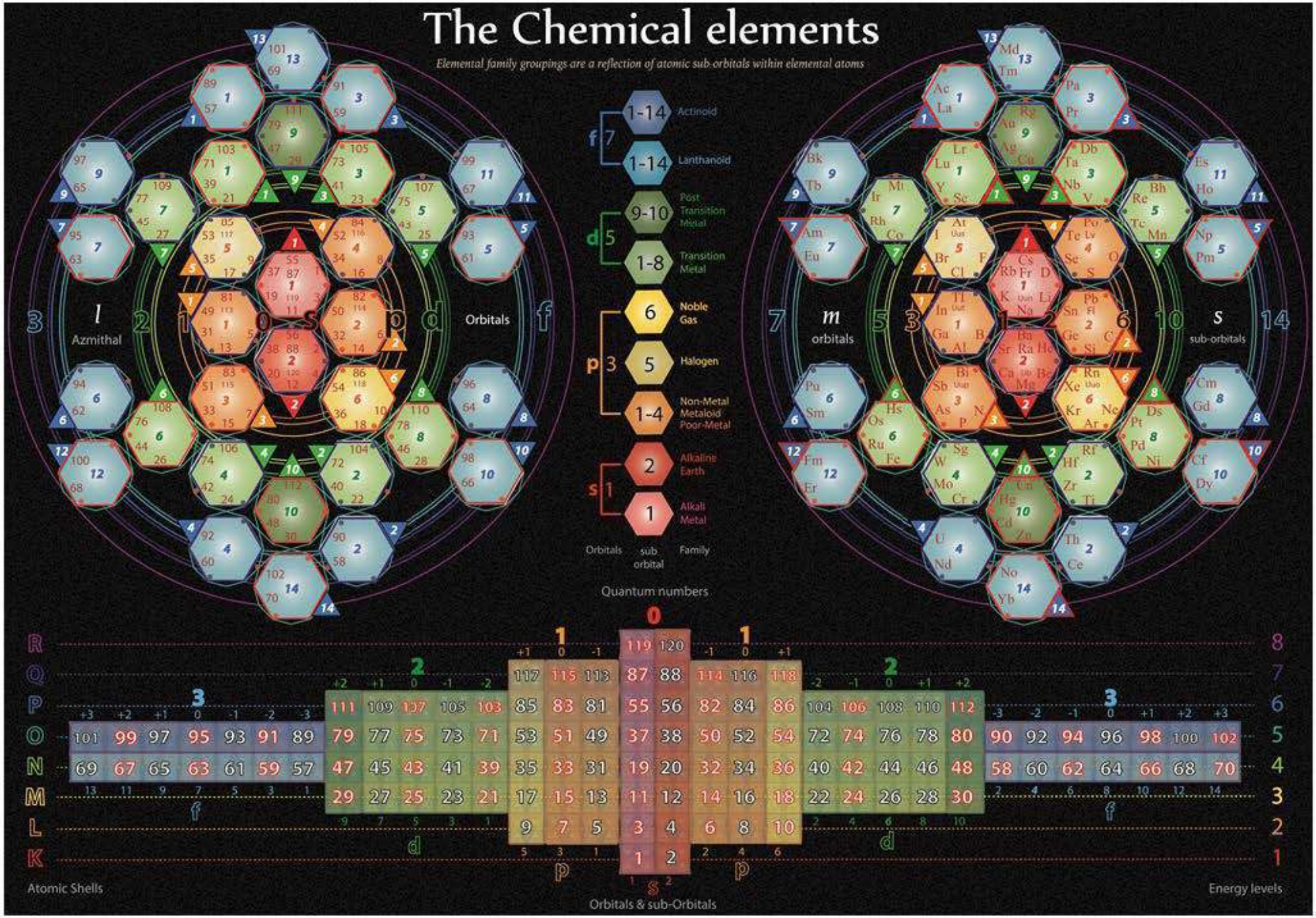

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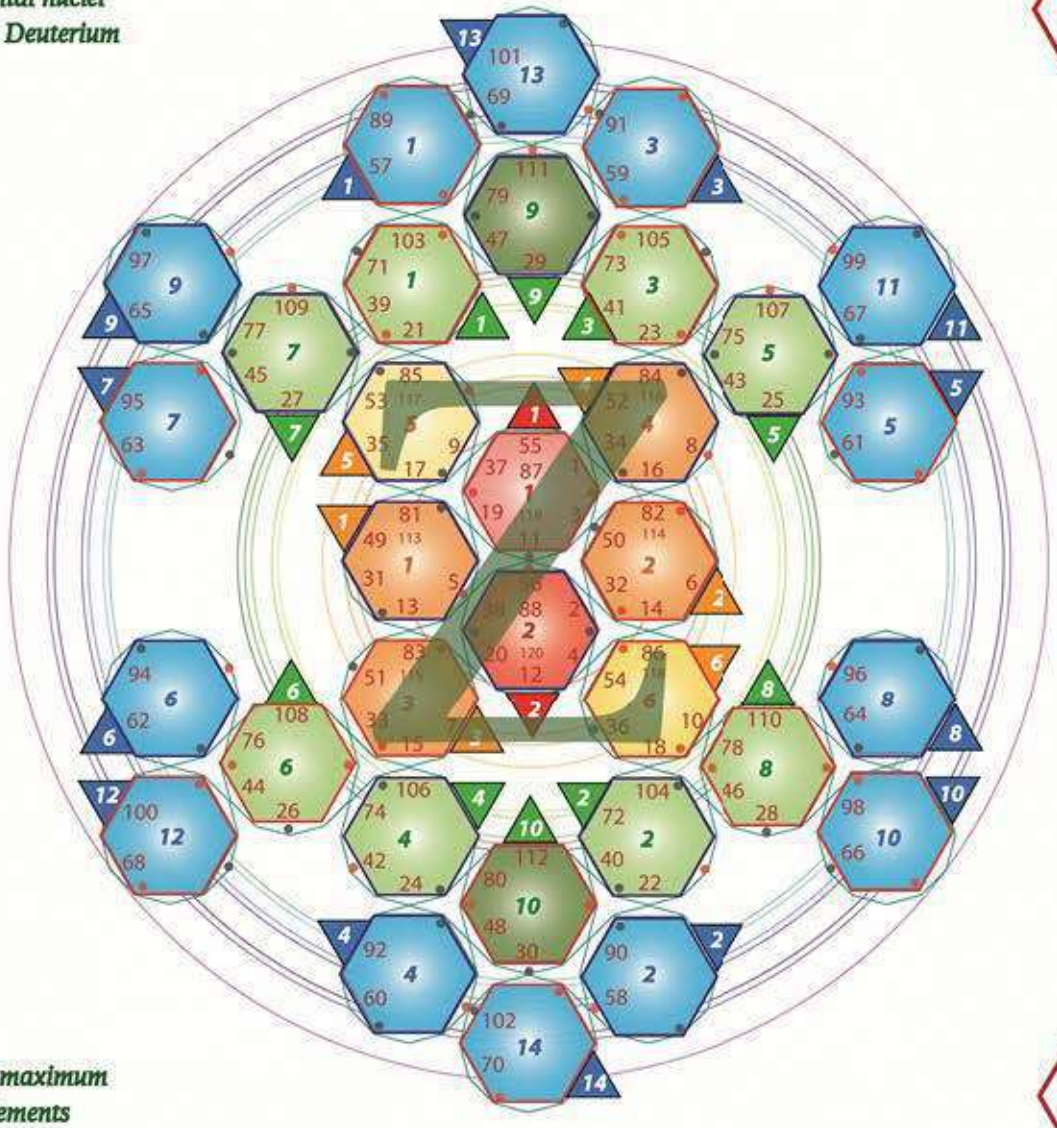
Element Numbers

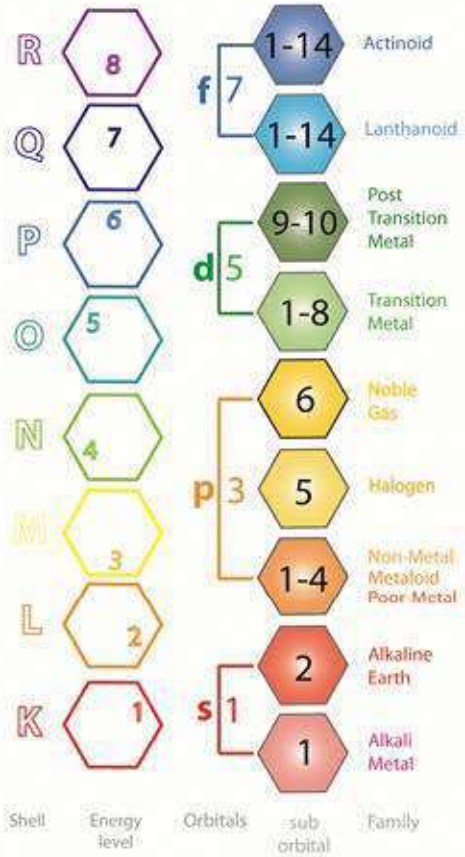
Z * 1 Proton [24-12]
1 Neutron [18-18]
1 electron [0-12]

Each elemental nuclei is made from Deuterium



Atomic shells: P Q R M O N K L

Energy levels: 1 2 3 4 5 6 7 8



o s 1 sub-Orbital (2 electrons max)
o p 3 sub-Orbitals (6 electrons max)
o d 5 sub-Orbitals (10 electrons max)
o f 7 sub-Orbitals (14 electrons max)

There are a maximum of 120 elements possible

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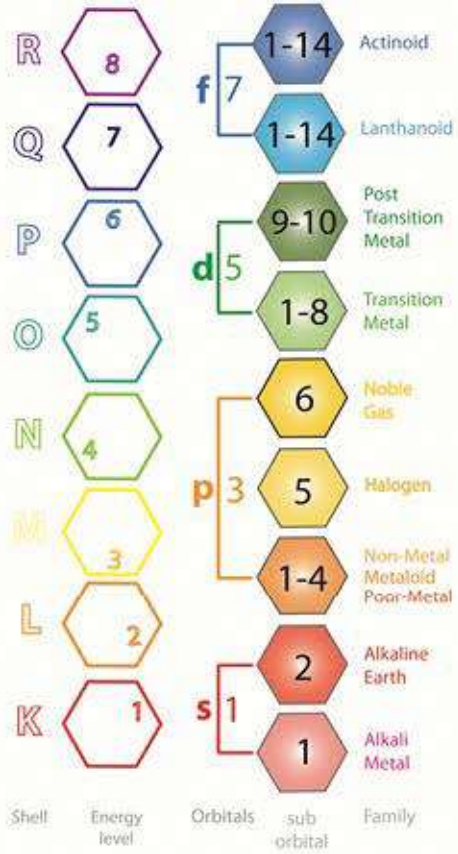
Element Names

Z * 1 Proton [24-12]
1 Neutron [18-18]
1 electron [0-12]



o s 1 sub-Orbital (2 electrons max)
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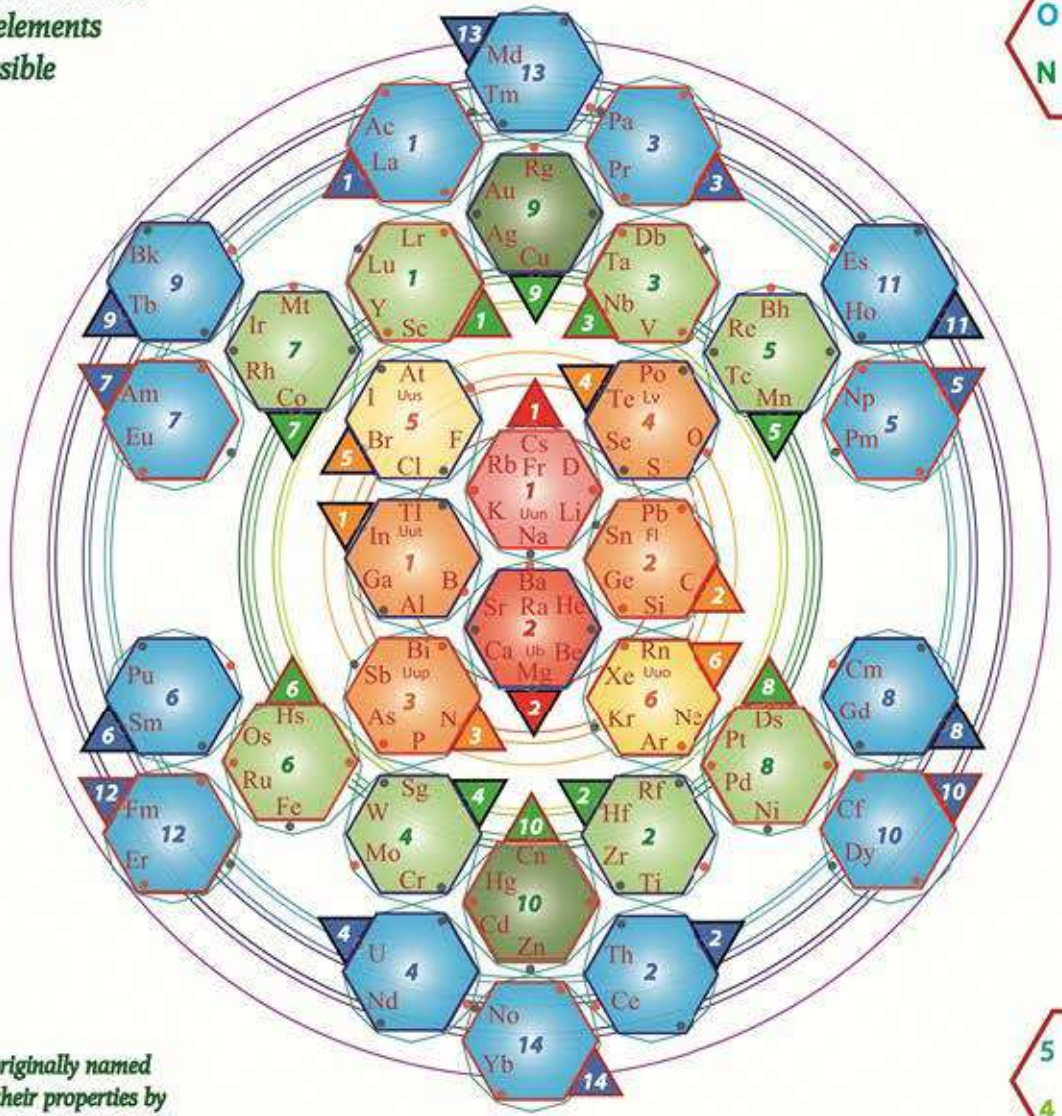
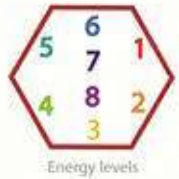
There are a maximum of 120 elements possible



They were originally named according to their properties by their discoverer but have recently been named after famous scientists



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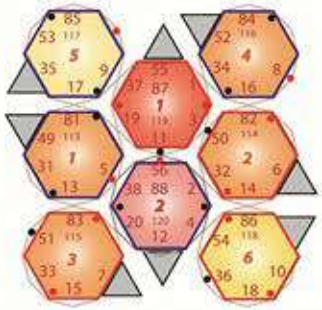
Electron orbital configurations

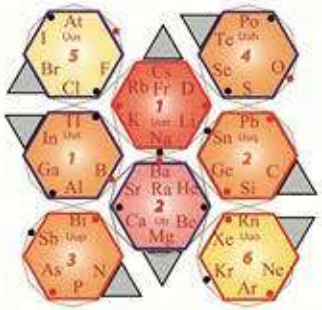
A huge number of differing d and f orbital configurations are possible given the number of nuclei and bond points created by elemental topologies

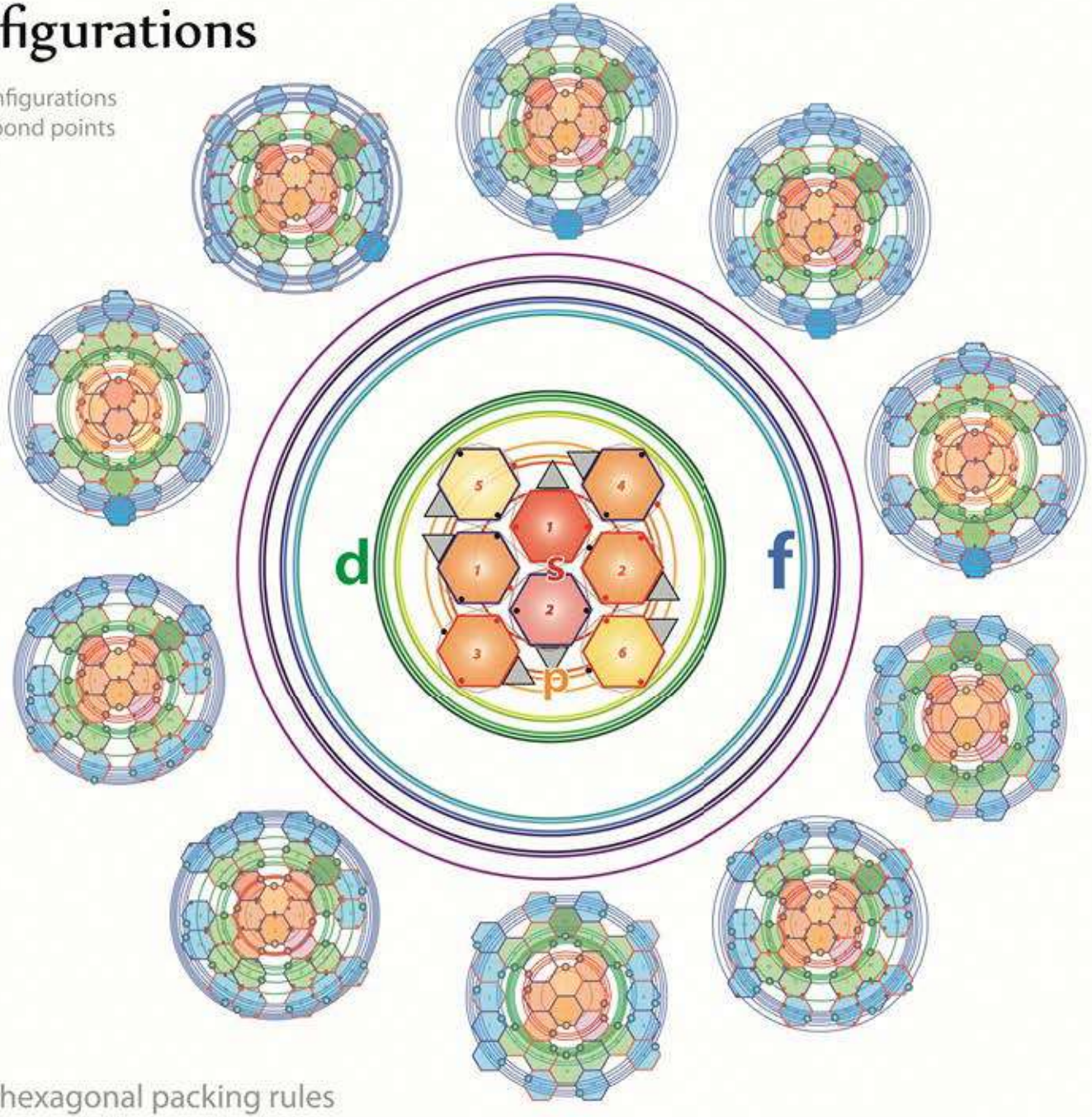


As the number of nucleons increases so does the complexity of the electron orbitals possible

quantum snowflakes

However all have a stable 'core' grouping of nuclei comprised of s and p electron orbitals





All nuclei bonding closely follows hexagonal packing rules

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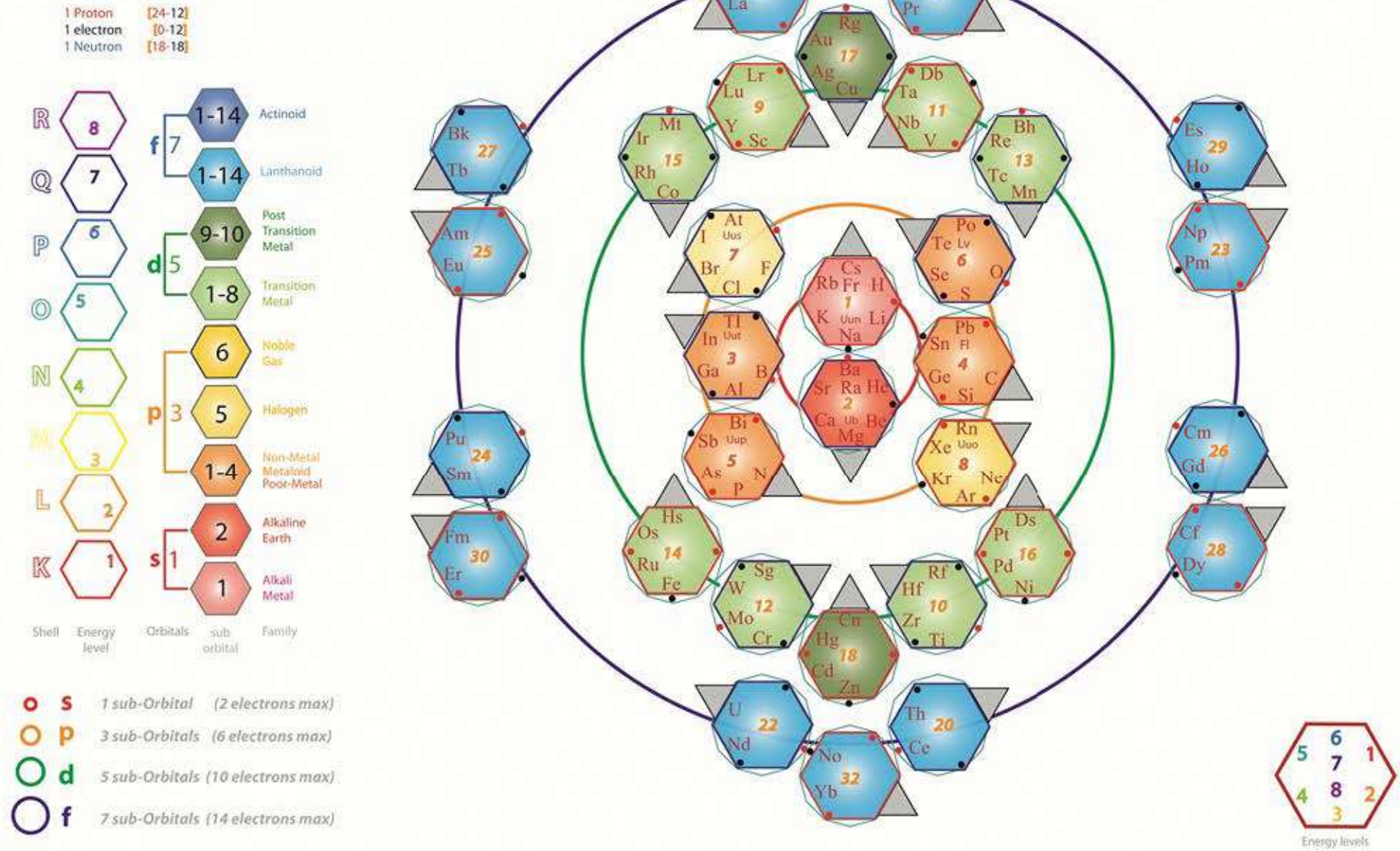
Atomic Nucleus
Exploded view



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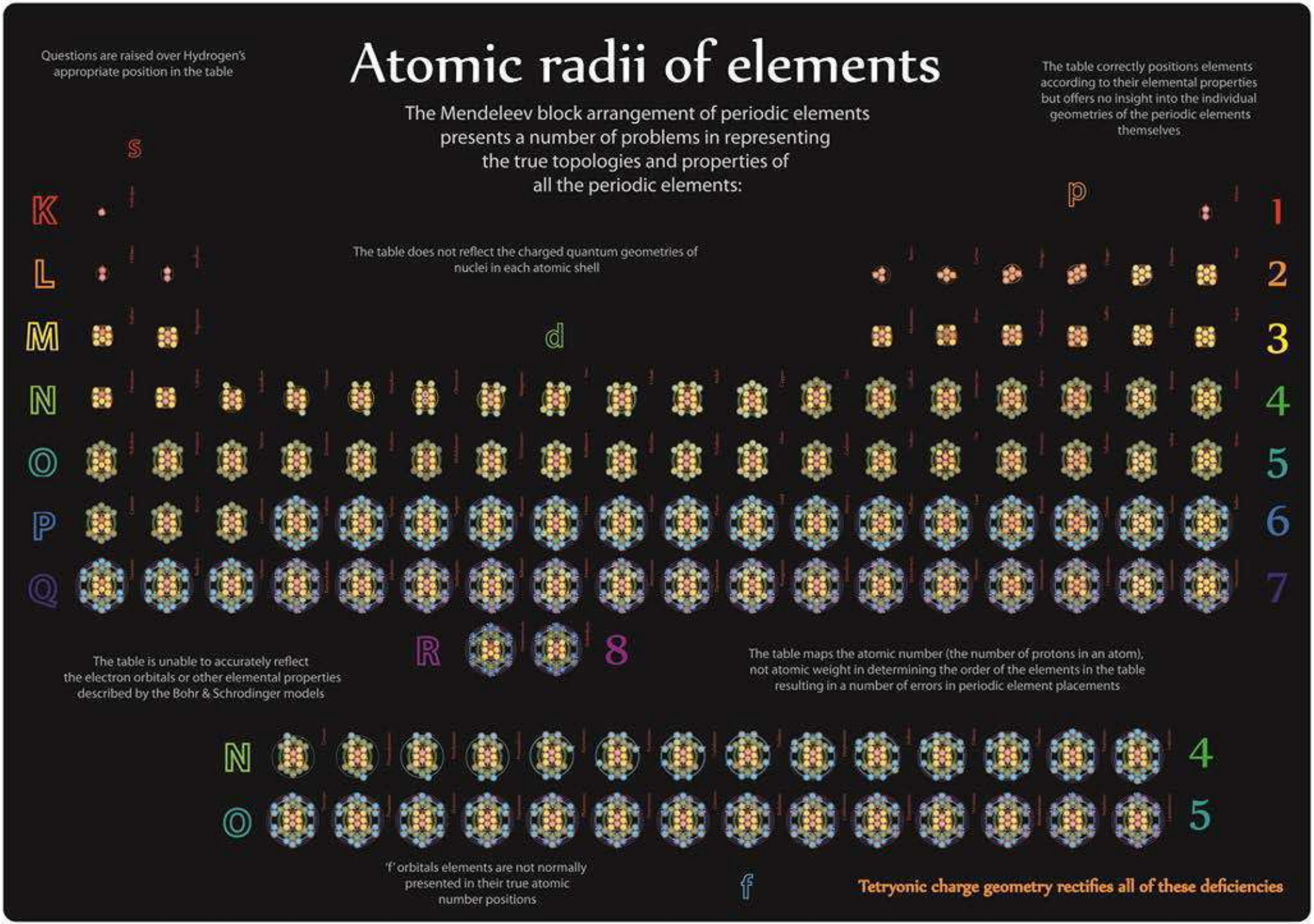
Atomic radii of elements
Questions are raised over Hydrogen's appropriate position in the table
The Mendeleev block arrangement of periodic elements presents a number of problems in representing the true topologies and properties of all the periodic elements:
The table correctly positions elements according to their elemental properties but offers no insight into the individual geometries of the periodic elements themselves
The table does not reflect the charged quantum geometries of nuclei in each atomic shell
s
p
d
f
K
L
M
N
O
P
Q
R
1
2
3
4
5
6
7
8
The table is unable to accurately reflect the electron orbitals or other elemental properties described by the Bohr & Schrodinger models
The table maps the atomic number (the number of protons in an atom), not atomic weight in determining the order of the elements in the table resulting in a number of errors in periodic element placements
'f' orbitals elements are not normally presented in their true atomic number positions
Tetryonic charge geometry rectifies all of these deficiencies

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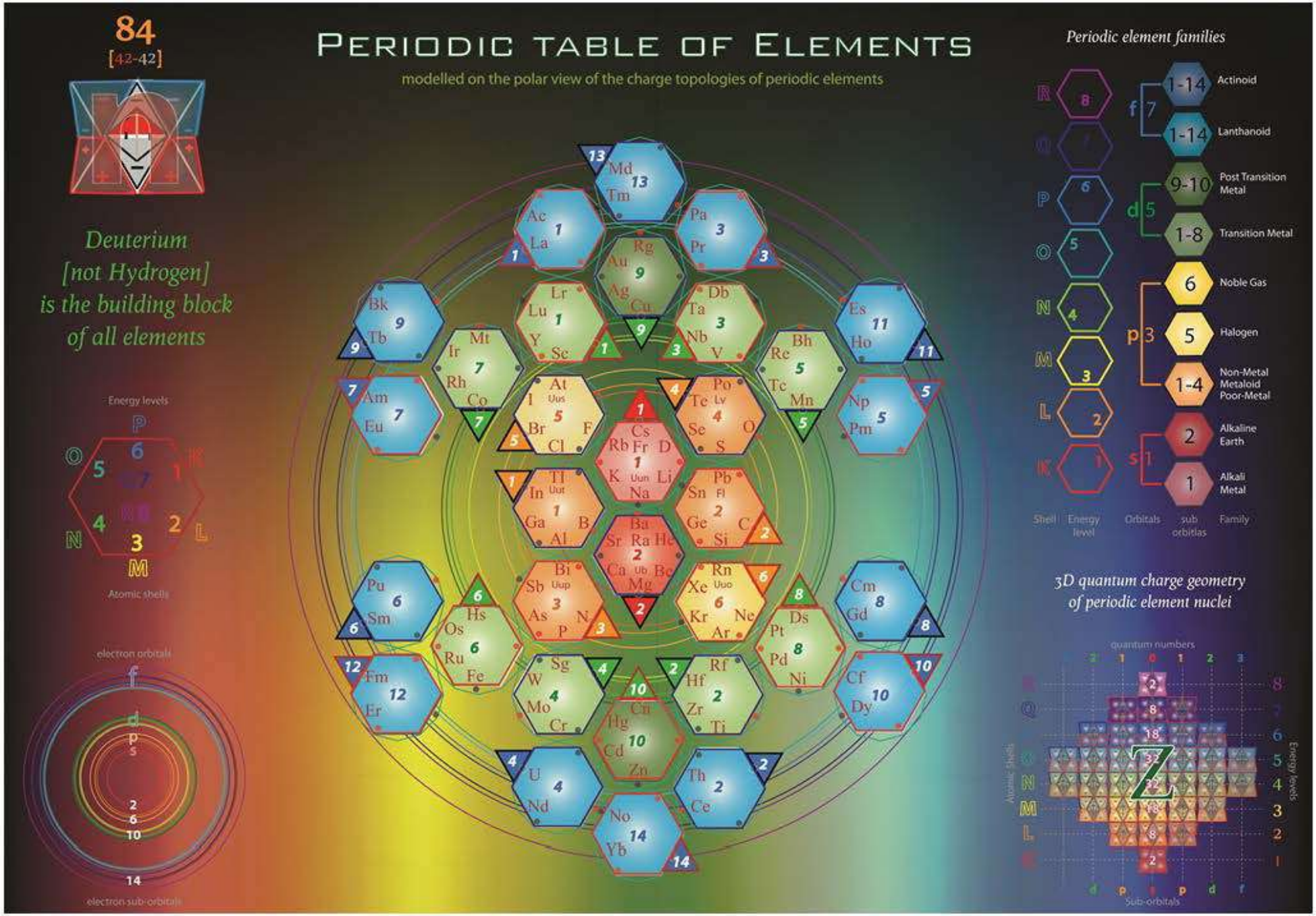

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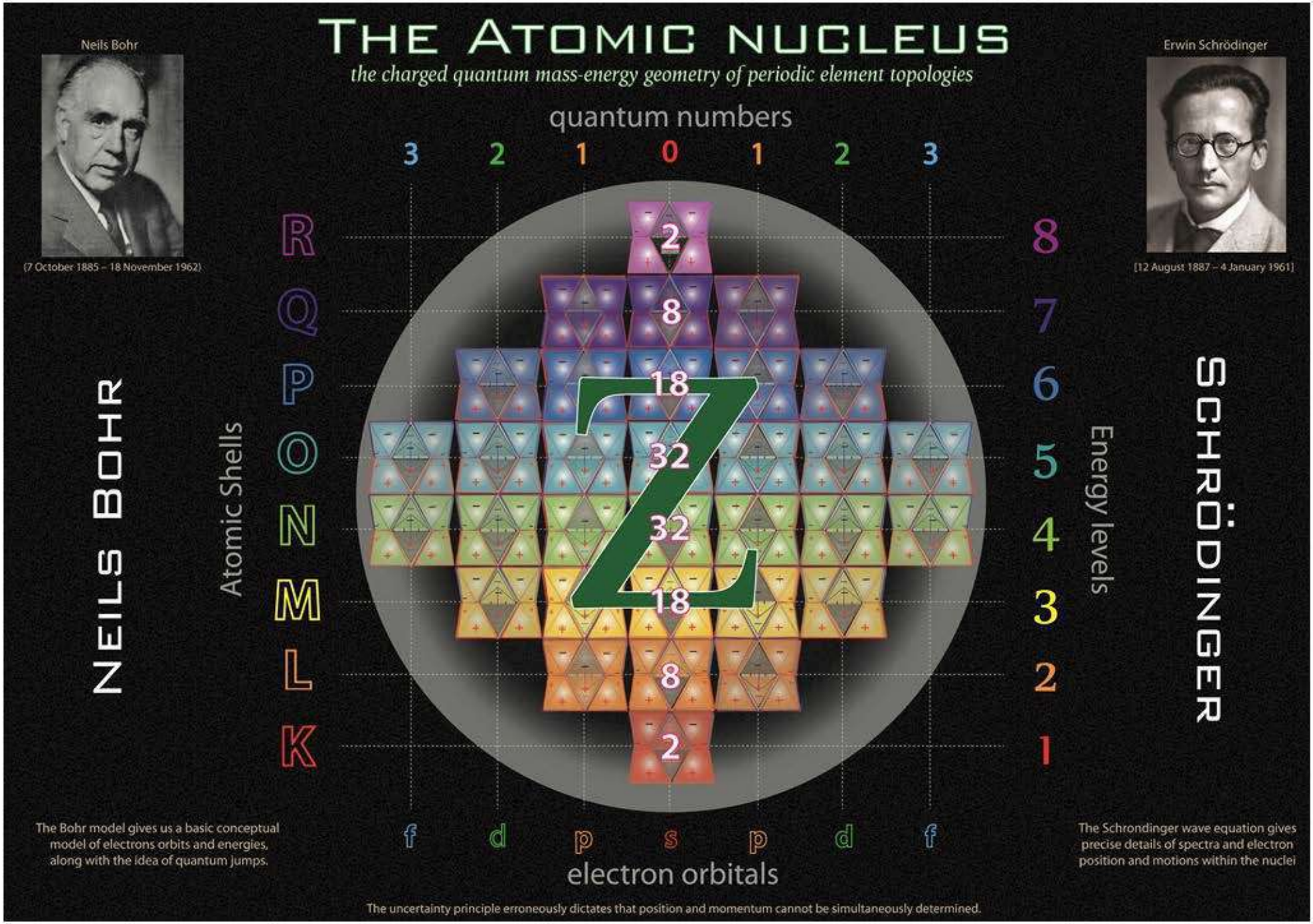
THE ATOMIC NUCLEUS
the charged quantum mass-energy geometry of periodic element topologies
Neils Bohr
(7 October 1885 – 18 November 1962)
Erwin Schrödinger
[12 August 1887 – 4 January 1961]
quantum numbers
3 2 1 0 1 2 3
R Q P O N M L K
Atomic Shells
8 7 6 5 4 3 2 1
Energy levels
NEILS BOHR
SCHRÖDINGER
2
8
18
32
32
18
8
2
Z
f d p s p d f
electron orbitals
The Bohr model gives us a basic conceptual model of electrons orbits and energies, along with the idea of quantum jumps.
The Schrondinger wave equation gives precise details of spectra and electron position and motions within the nuclei
The uncertainty principle erroneously dictates that position and momentum cannot be simultaneously determined.

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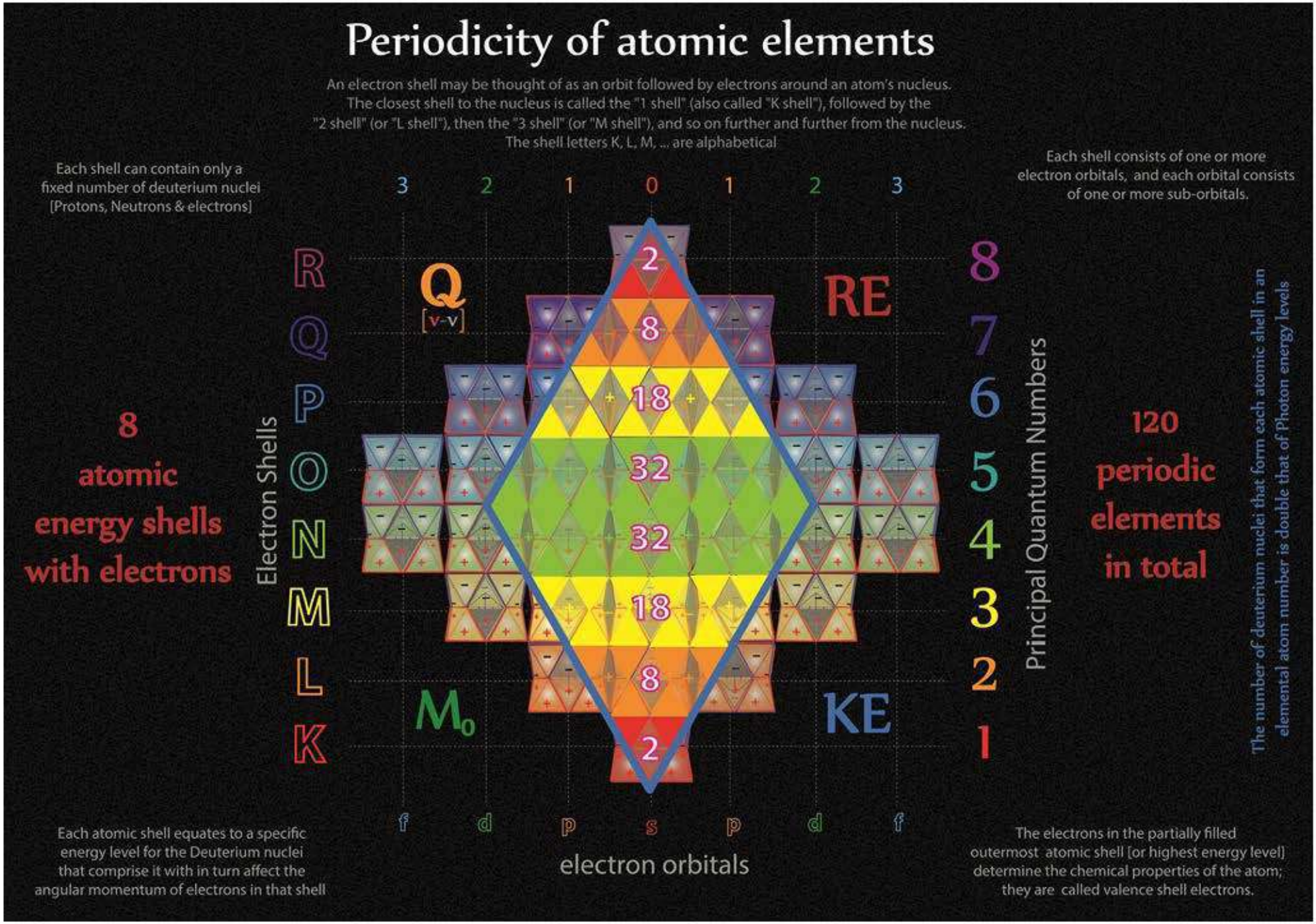
Periodicity of atomic elements
An electron shell may be thought of as an orbit followed by electrons around an atom's nucleus.
The closest shell to the nucleus is called the "1 shell" (also called "K shell"), followed by the
"2 shell" (or "L shell"), then the "3 shell" (or "M shell"), and so on further and further from the nucleus.
The shell letters K, L, M, ... are alphabetical
Each shell can contain only a fixed number of deuterium nuclei [Protons, Neutrons & electrons]
Each shell consists of one or more electron orbitals, and each orbital consists of one or more sub-orbitals.
3 2 1 0 1 2 3
R Q P O N M L K
Electron Shells
Q [v-v]
RE
KE
M_0
2
8
18
32
32
18
8
2
8 7 6 5 4 3 2 1
Principal Quantum Numbers
8 atomic energy shells with electrons
120 periodic elements in total
The number of deuterium nuclei that form each atomic shell in an elemental atom number is double that of Photon energy levels
f d p s p d f
electron orbitals
Each atomic shell equates to a specific energy level for the Deuterium nuclei that comprise it with in turn affect the angular momentum of electrons in that shell
The electrons in the partially filled outermost atomic shell [or highest energy level] determine the chemical properties of the atom; they are called valence shell electrons.

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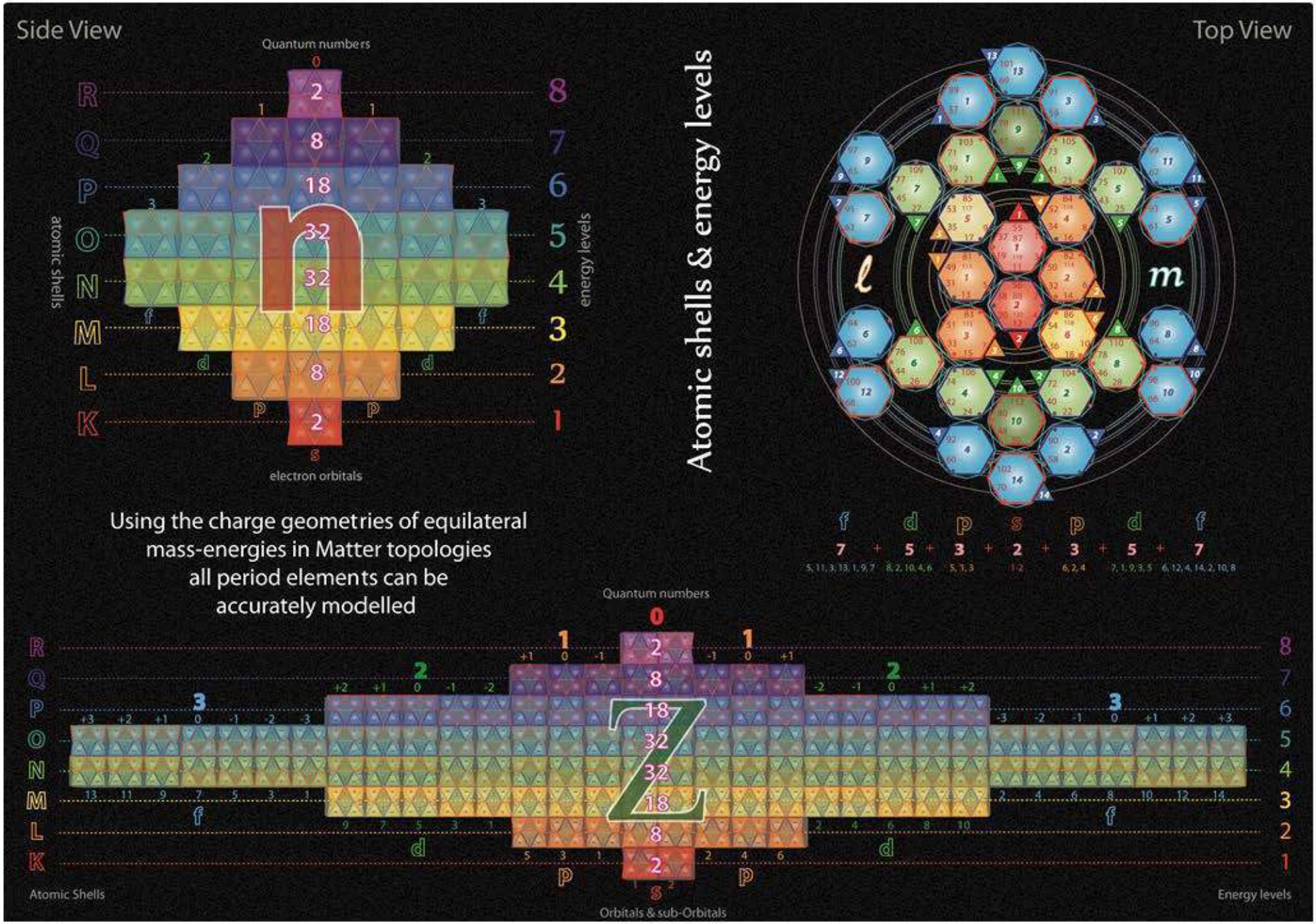

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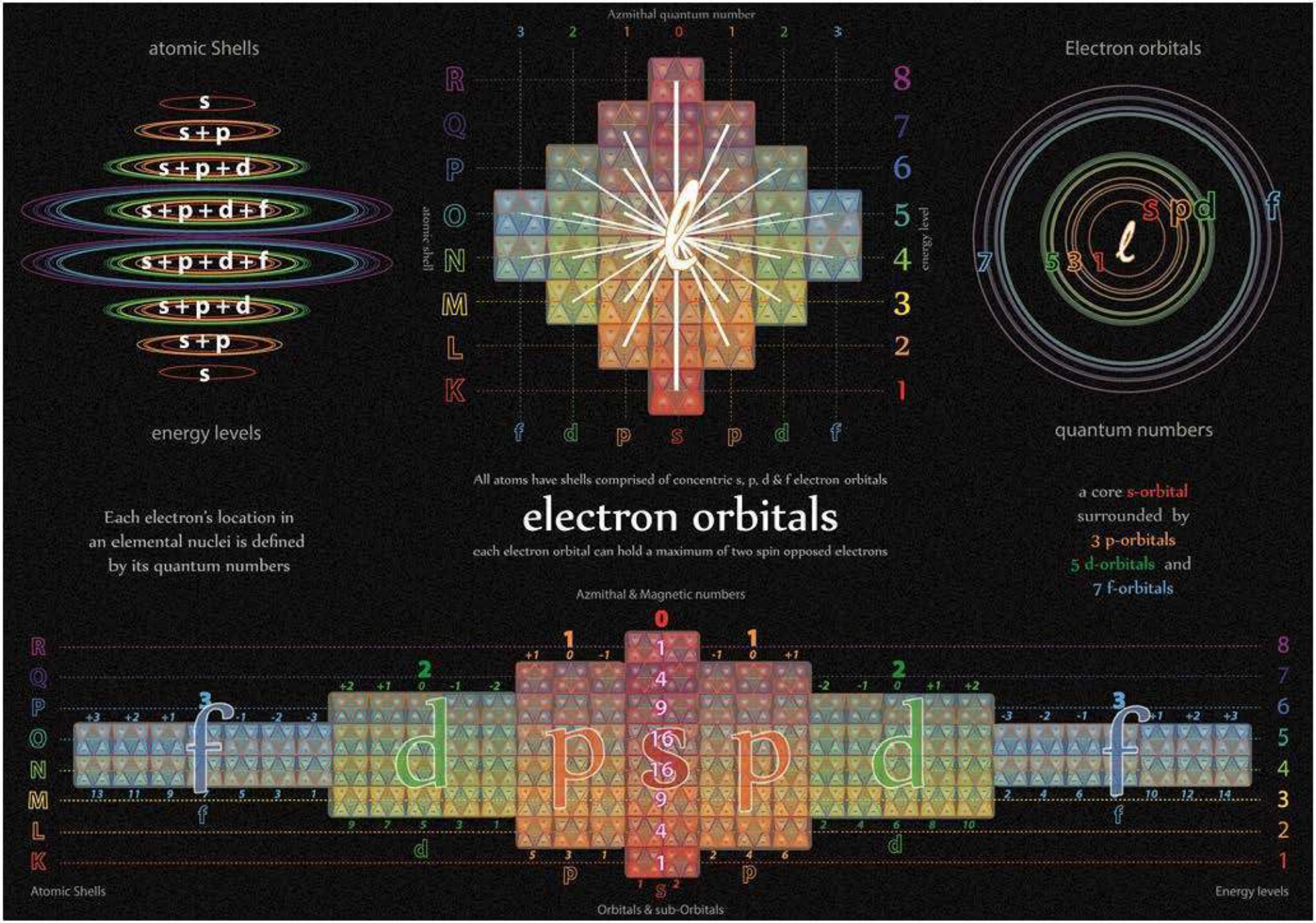
atomic Shells
s
s+p
s+p+d
s+p+d+f
s+p+d+f
s+p+d
s+p
s
energy levels
Azmithal quantum number
3 2 1 0 1 2 3
R Q P O N M L K
8 7 6 5 4 3 2 1
atomic shell
energy level
f d p s p d f
Electron orbitals
s p d f
7 5 3 1
quantum numbers
All atoms have shells comprised of concentric s, p, d & f electron orbitals
electron orbitals
each electron orbital can hold a maximum of two spin opposed electrons
Each electron's location in an elemental nuclei is defined by its quantum numbers
a core s-orbital surrounded by 3 p-orbitals 5 d-orbitals and 7 f-orbitals
Azmithal & Magnetic numbers
Atomic Shells
Energy levels
Orbitals & sub-Orbitals

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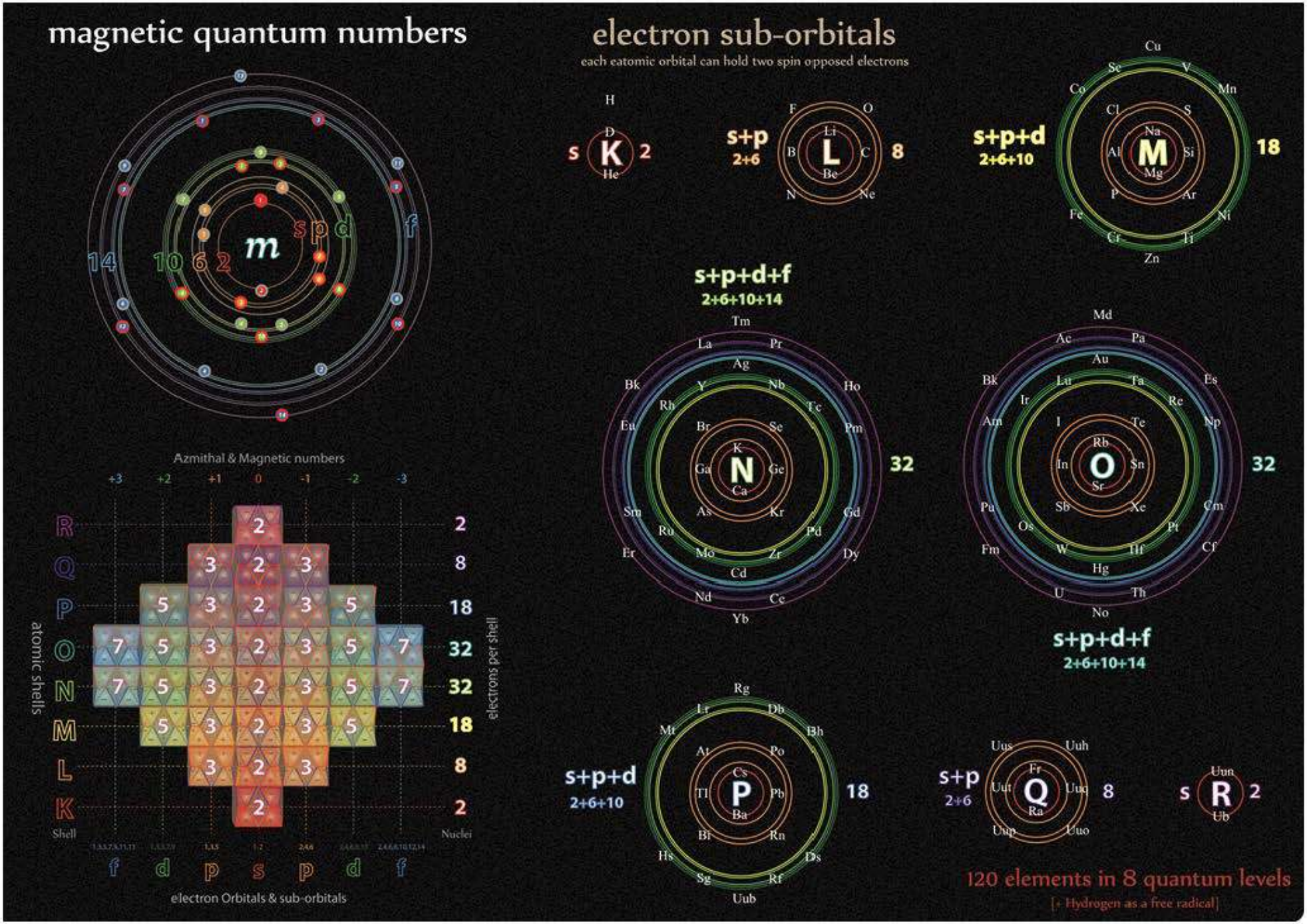
magnetic quantum numbers
m
s p d f
14 10 6 2
Azmithal & Magnetic numbers
+3 +2 +1 0 -1 -2 -3
R Q P O N M L K
atomic shells
electrons per shell
Shell
Nuclei
f d p s p d f
electron Orbitals & sub-orbitals
electron sub-orbitals
each eatomic orbital can hold two spin opposed electrons
s K 2
s+p 2+6 L 8
s+p+d 2+6+10 M 18
s+p+d+f 2+6+10+14 N 32
s+p+d+f 2+6+10+14 O 32
s+p+d 2+6+10 P 18
s+p 2+6 Q 8
s R 2
120 elements in 8 quantum levels
[+ Hydrogen as a free radical]

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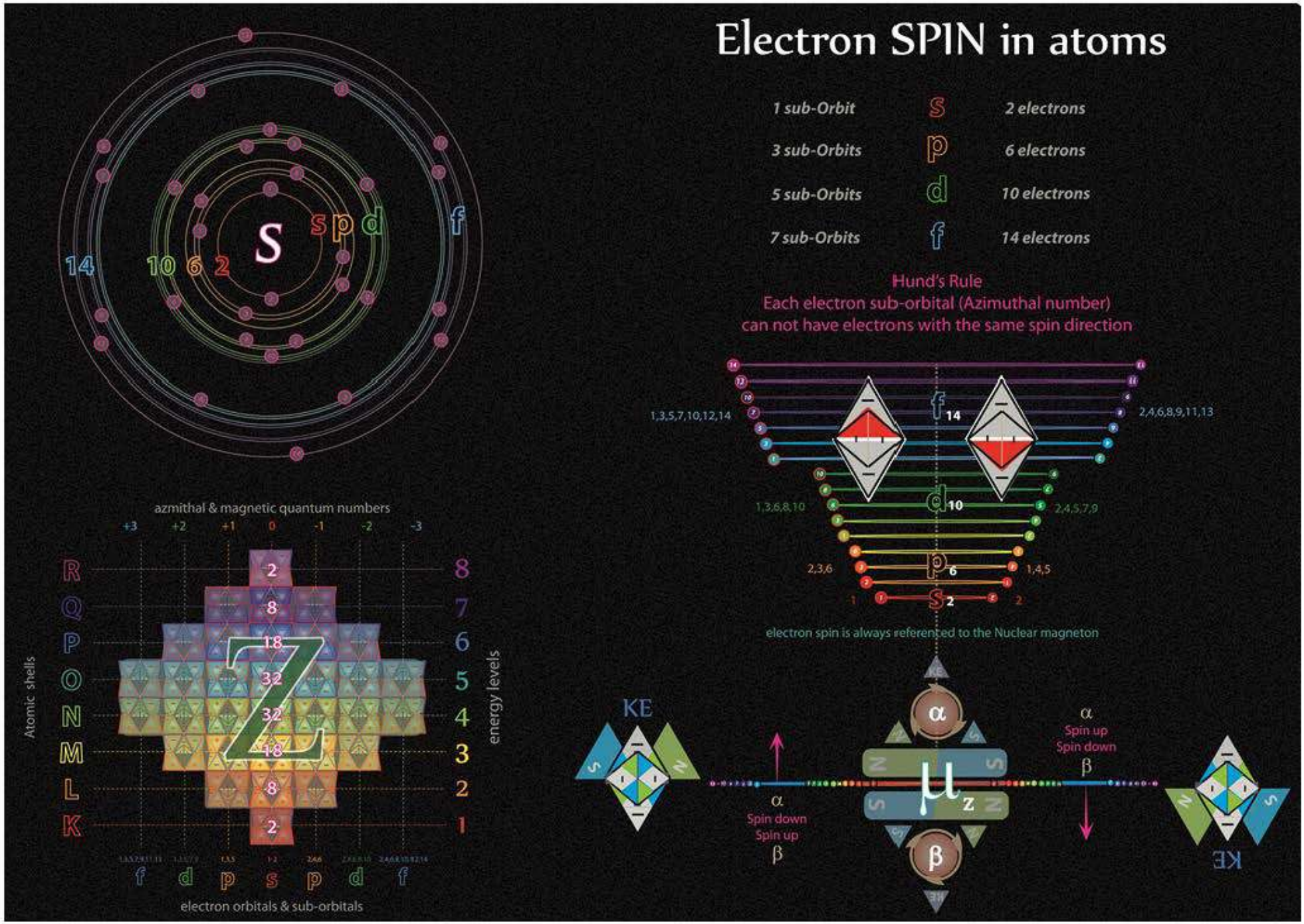

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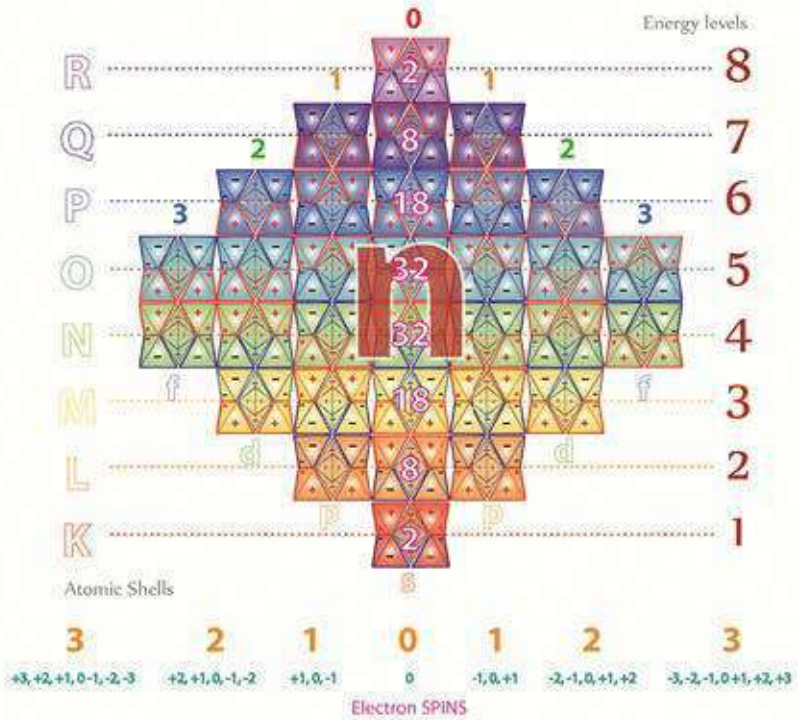
Quantum numbers



The properties of every atom's specific electron configuration can be described by four quantum numbers:

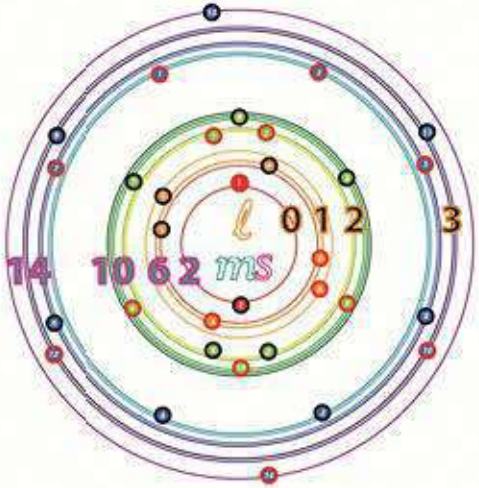
n (1-8)
Principal
(n = 1, 2, 3, 4 ...)

ℓ (0-3)
Azimuthal
(l = 0, 1 ... n−1)

m (2ℓ+1)
Magnetic
(ml = −l, −l+1 ... 0 ... l−1, l)

s ±½
electron Spin
(ms = −1/2 or +1/2).

The Bohr model was a one-dimensional model that used one quantum number to describe the distribution of electrons

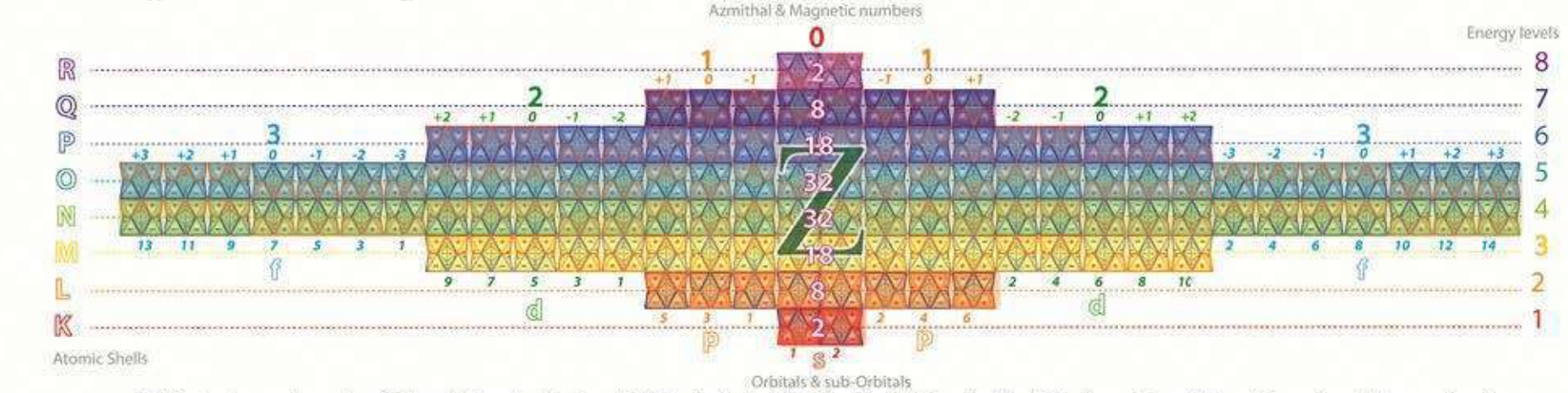


The three coordinates that come from Schrödinger's wave equations are the principal (n), angular (l), and magnetic (m) quantum numbers.

These quantum numbers describe the size, shape, and orientation in space of the orbitals of any particular atom mathematically.

These four numbers, n, ℓ, m and s can be used to describe any electron in a stable atom [and can be mapped back to the classical terminology of Shells and electron orbitals].

Each electron's quantum numbers are unique and cannot be shared by another electron in that atom.



A stable atom has equal numebrs of Protons, electrons [and Neutrons], all following the Pauli Exclusion Principle thus orientating their spins so that each element has a unique electron configuration

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PRINCIPAL quantum number

The first describes the electron shell, or energy level, of an atom.

This is the only quantum number introduced by the Bohr model

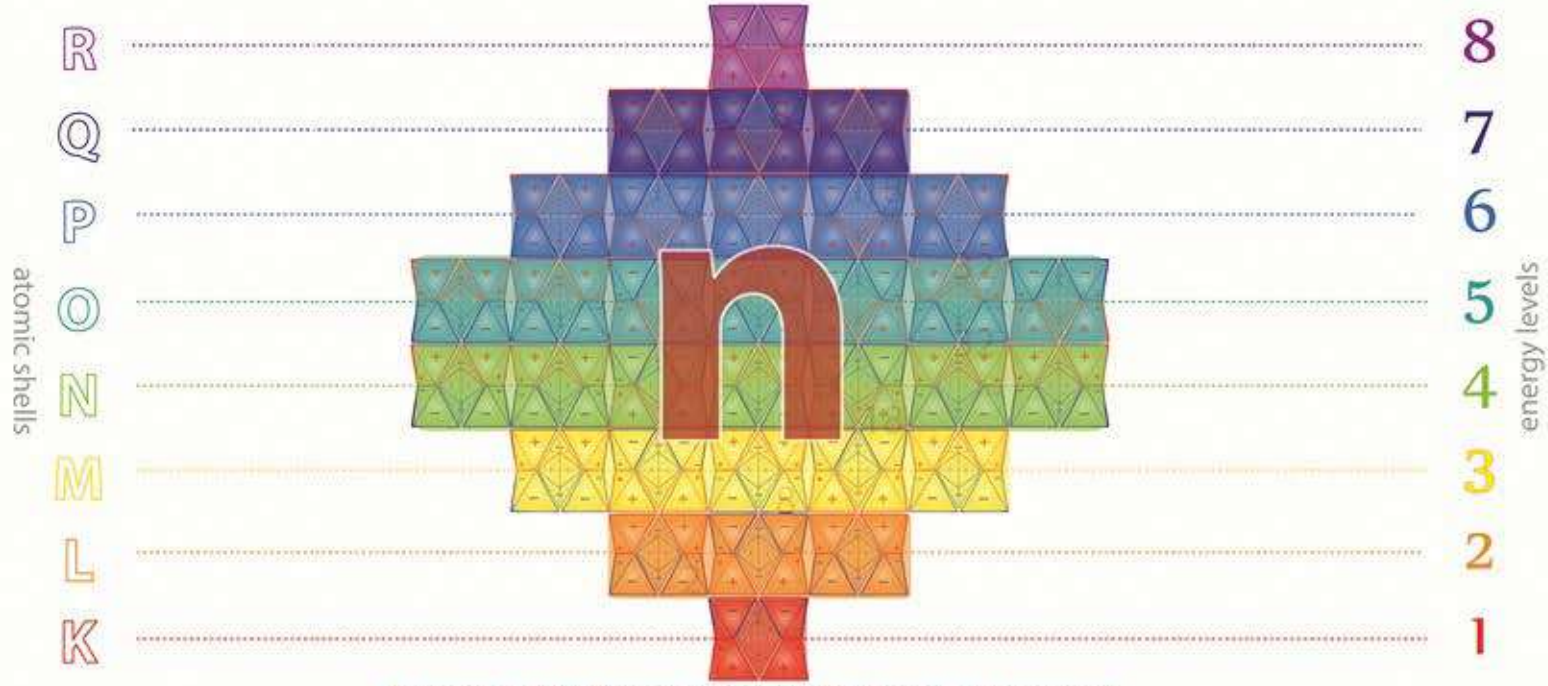
atomic shells

n(1-8)

(n = 1, 2, 3, 4 ...)

The principal quantum number can only have positive integer values

energy levels



As energies of the Baryons comprising the atomic nuclei increases, the electron bound to each nuclei also possesses more KEM field energies and is therefore less tightly bound to the nucleus

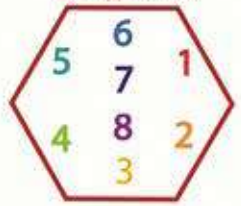
Atomic Shells

(K, L, M, N, O, P, Q, R)

Atomic shells relate directly to Principal quantum numbers

(1, 2, 3, 4, 5, 6, 7, 8)

Energy levels



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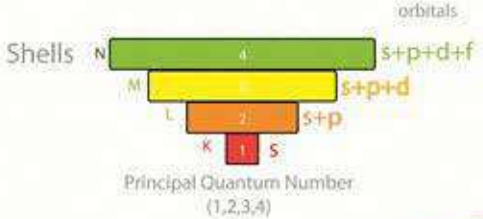
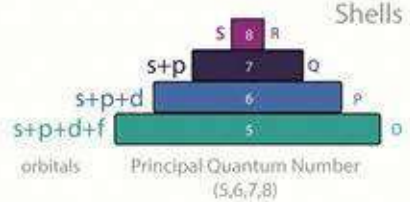
AZMITHAL quantum number

The azimuthal quantum number is a quantum number assigned to any atomic orbital that describes its orbital angular momentum and determines the shape of the electron orbital



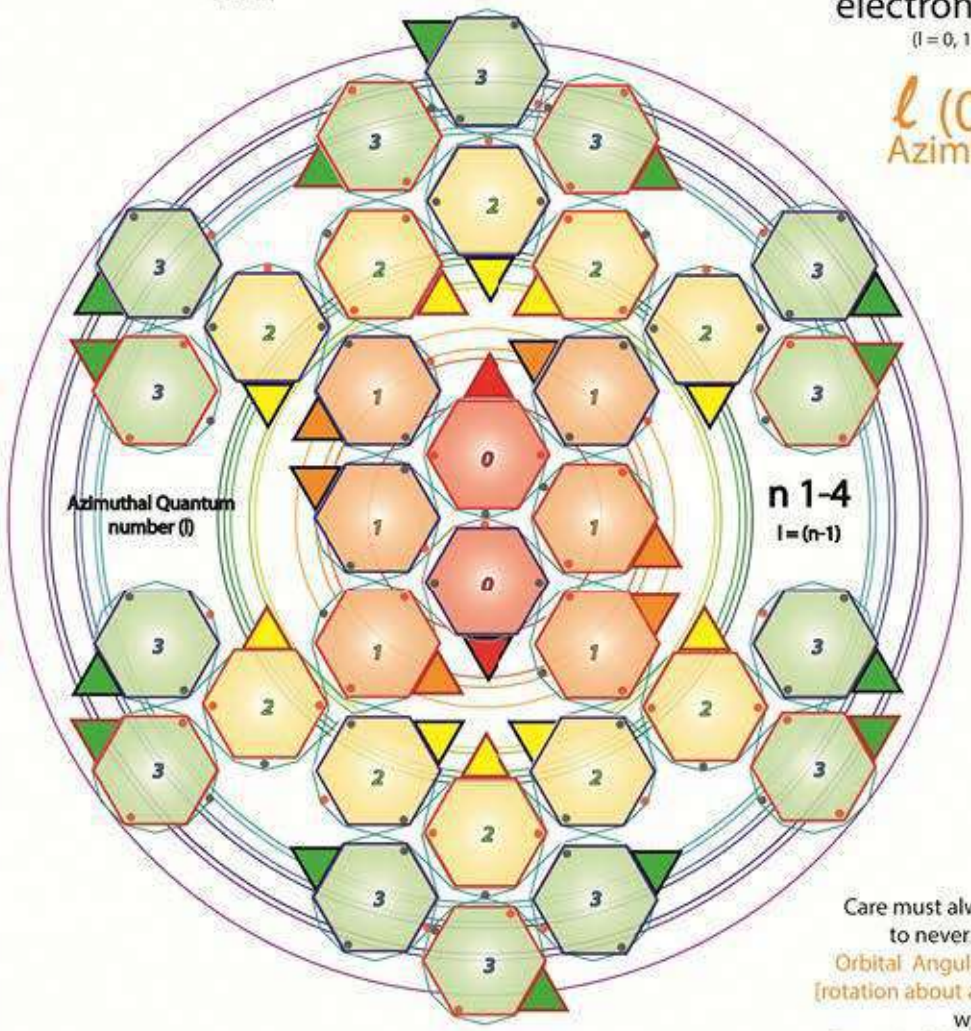


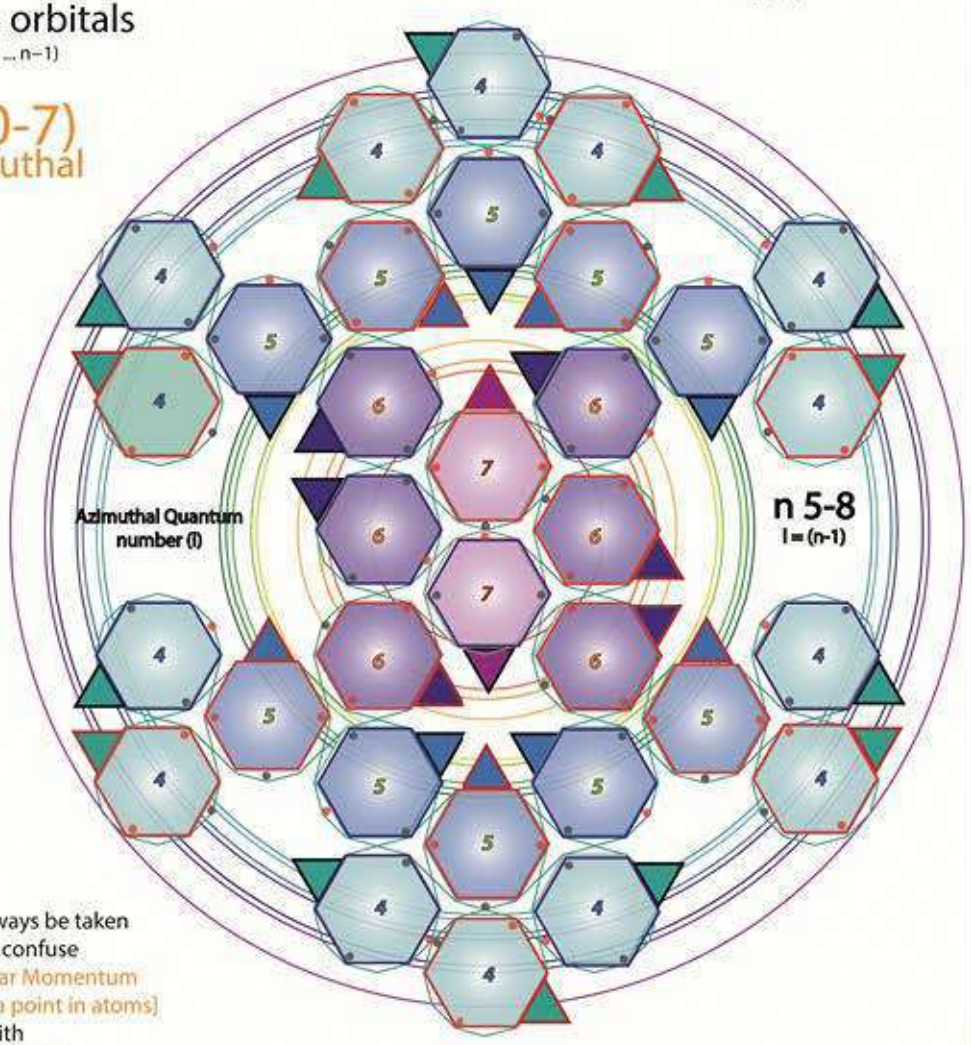
s p d f

electron orbitals

(l = 0, 1 .., n−1)

ℓ (0-7)
Azimuthal





Care must always be taken
to never confuse
Orbital Angular Momentum
[rotation about a point in atoms]
with
Quantised Angular Momenta
[equilateral Planck energy geometries]

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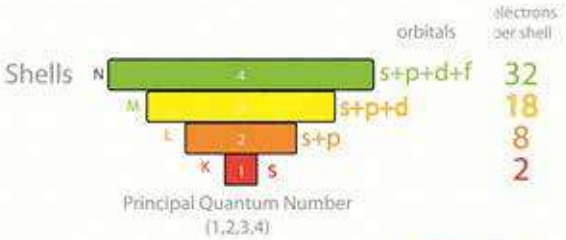
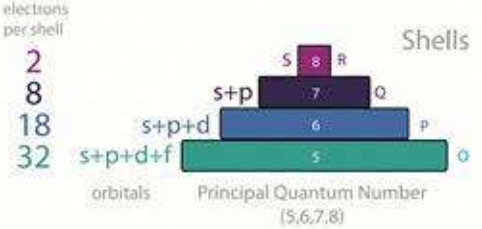
MAGNETIC quantum number



The magnetic quantum number denotes the energy levels available within any subshell

Magnetic numbers do not continue to increase as the Principal numbers increase instead they reverse after n4 to reflect the charged quanutm geometry of Elements and do not follow the current computer models in popular use



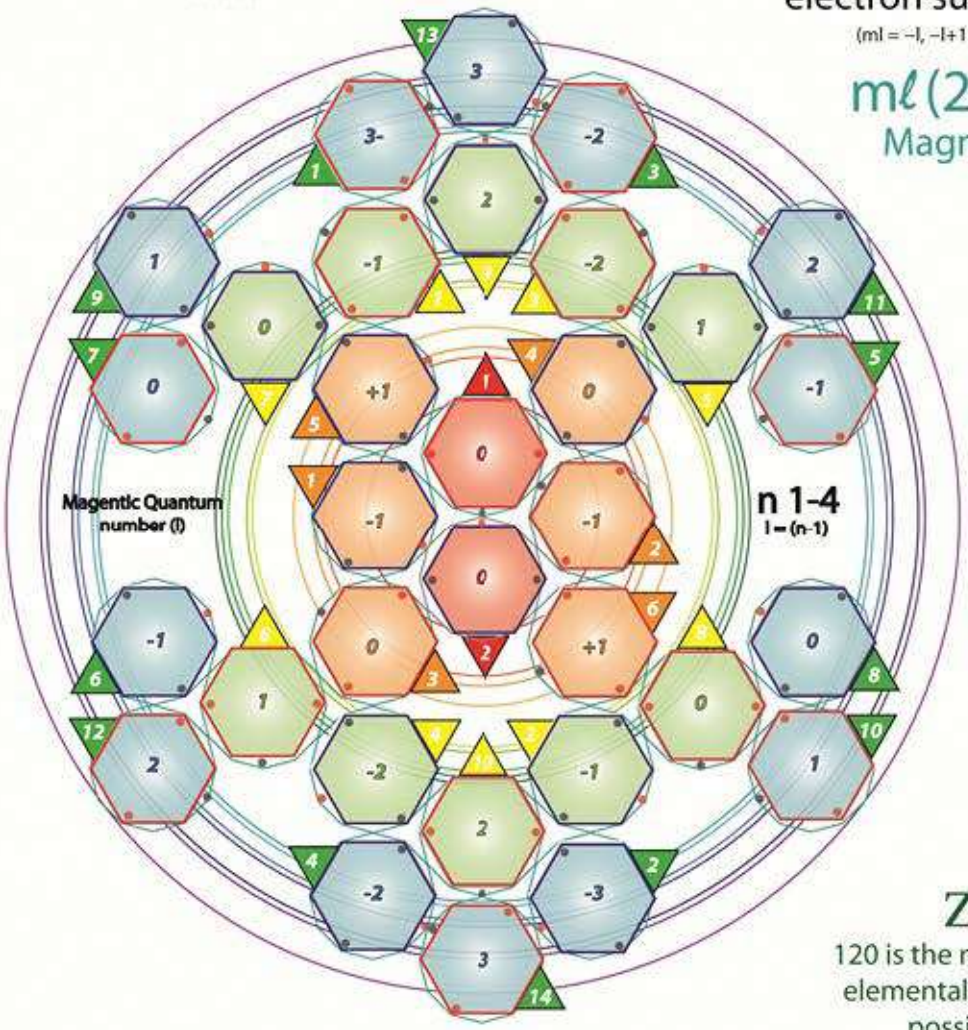
s p d f

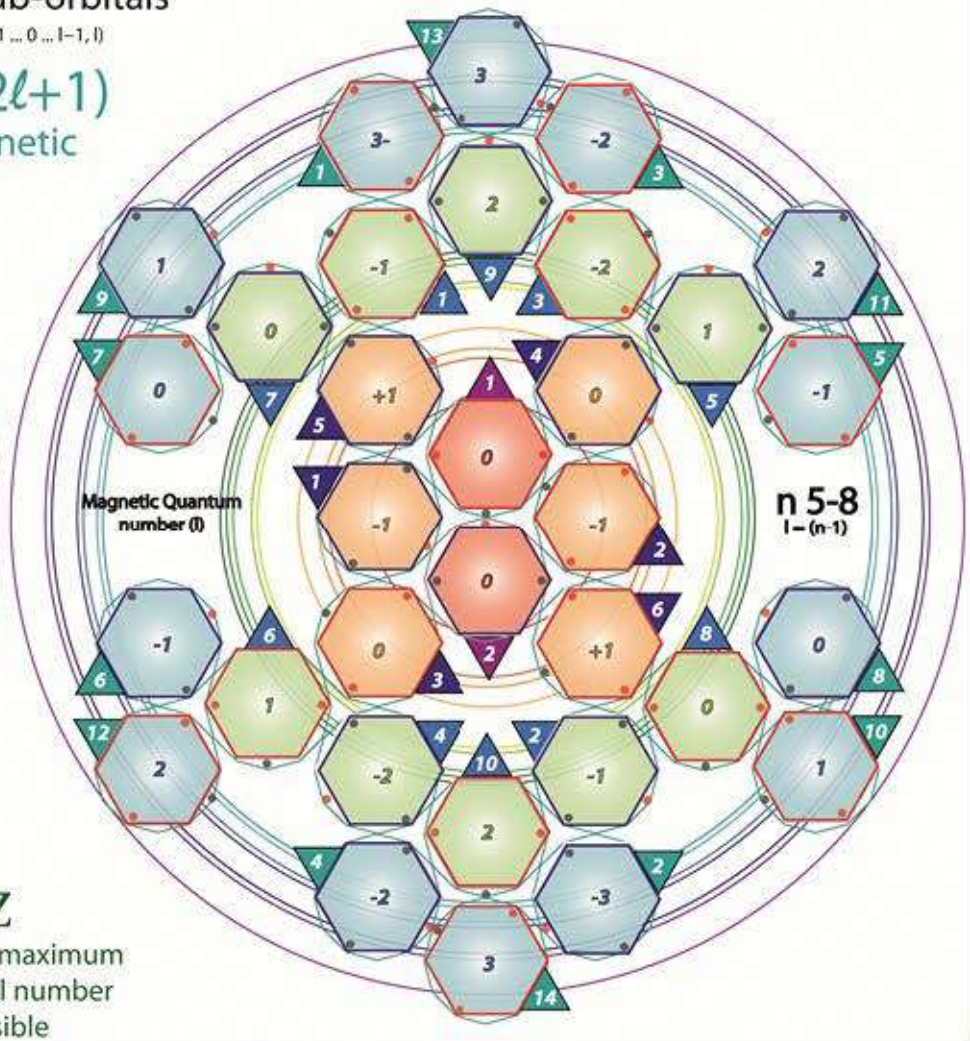
electron sub-orbitals

(ml = −l, −l+1 ... 0 ... l−1, l)

$m\ell\,(2\ell+1)$

Magnetic





Z

120 is the maximum elemental number possible

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SPIN quantum number

The spin quantum number is a quantum number that parameterizes the intrinsic angular momentum (or spin angular momentum), of any given electron anywhere in an atomic nucleus

parallel magnetic moments

Spin UP

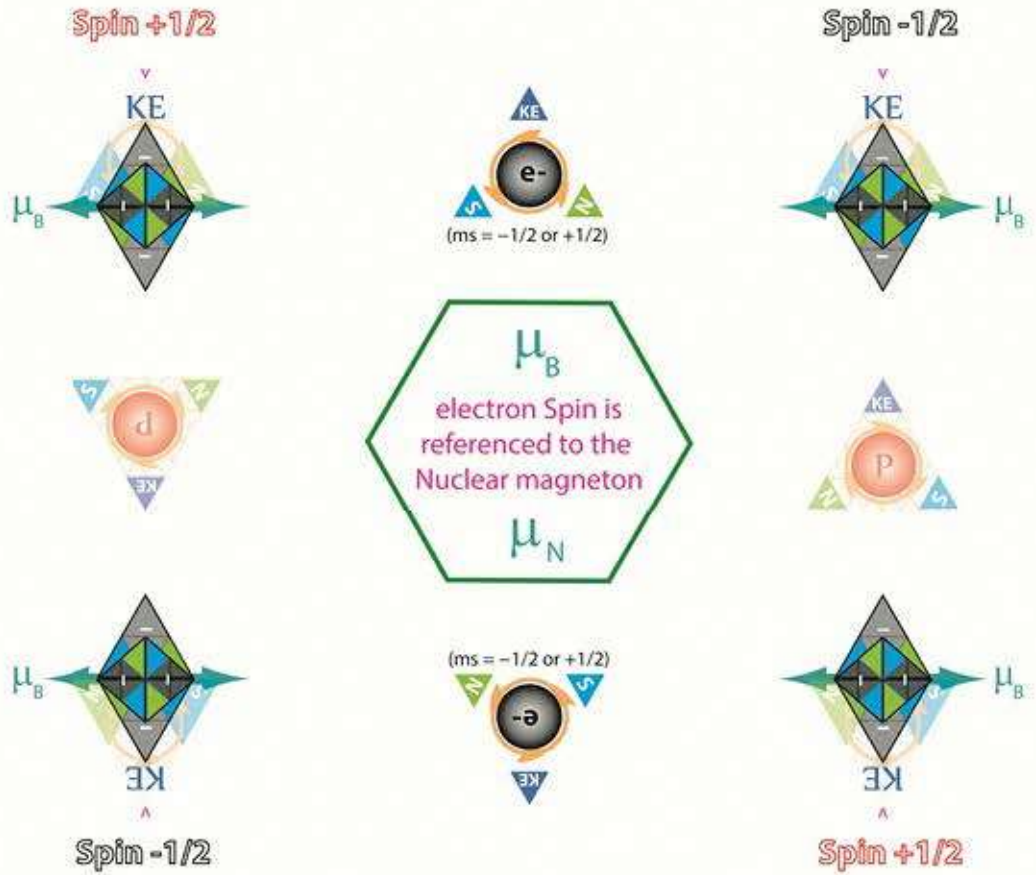
higher coupling energies

anti-parallel magnetic moments

Spin DOWN

lower coupling energies

Electron spin can orientate in either direction within Nuclei, providing the nett spins follow the Hund rule and Pauli exclusion principle



The nuclear energy levels of the Baryons comprising Elemental nuclei determine the energy-momenta of electrons bound to them

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Modifying Hund's Rule

Electrons fill orbitals in an alternating sequential numbering pattern due to nucleon placement creating opposed direction electron spins

The increased stability of the atom, most commonly manifested in a lower energy state, arises because the high-spin state forces the unpaired electrons to reside in different spatial orbitals.

A commonly given reason for the increased stability of high multiplicity states is that the different occupied spatial orbitals create a larger average distance between electrons, reducing electron-electron repulsion energy. In reality, it has been shown that the actual reason behind the increased stability is a decrease in the screening of electron-nuclear attractions[1].

The total spin state is calculated as the total number of unpaired electrons + 1, or twice the total spin + 1 written as 2s+1.

As a result of Hund's rule, constraints are placed on the way atomic orbitals are filled using the Aufbau principle.

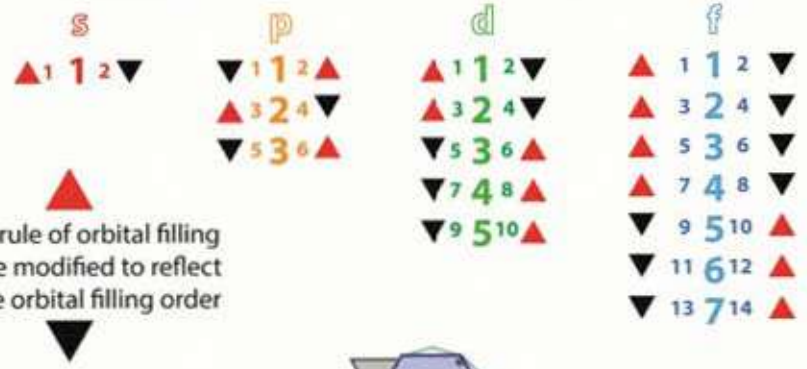
Before any two electrons occupy an orbital in a subshell, other orbitals in the same subshell must first each contain one electron. Also, the electrons filling a subshell will have parallel spin before the shell starts filling up with the opposite spin electrons (after the first orbital gains a second electron).

As a result, when filling up atomic orbitals, the maximum number of unpaired electrons (and hence maximum total spin state) is assured

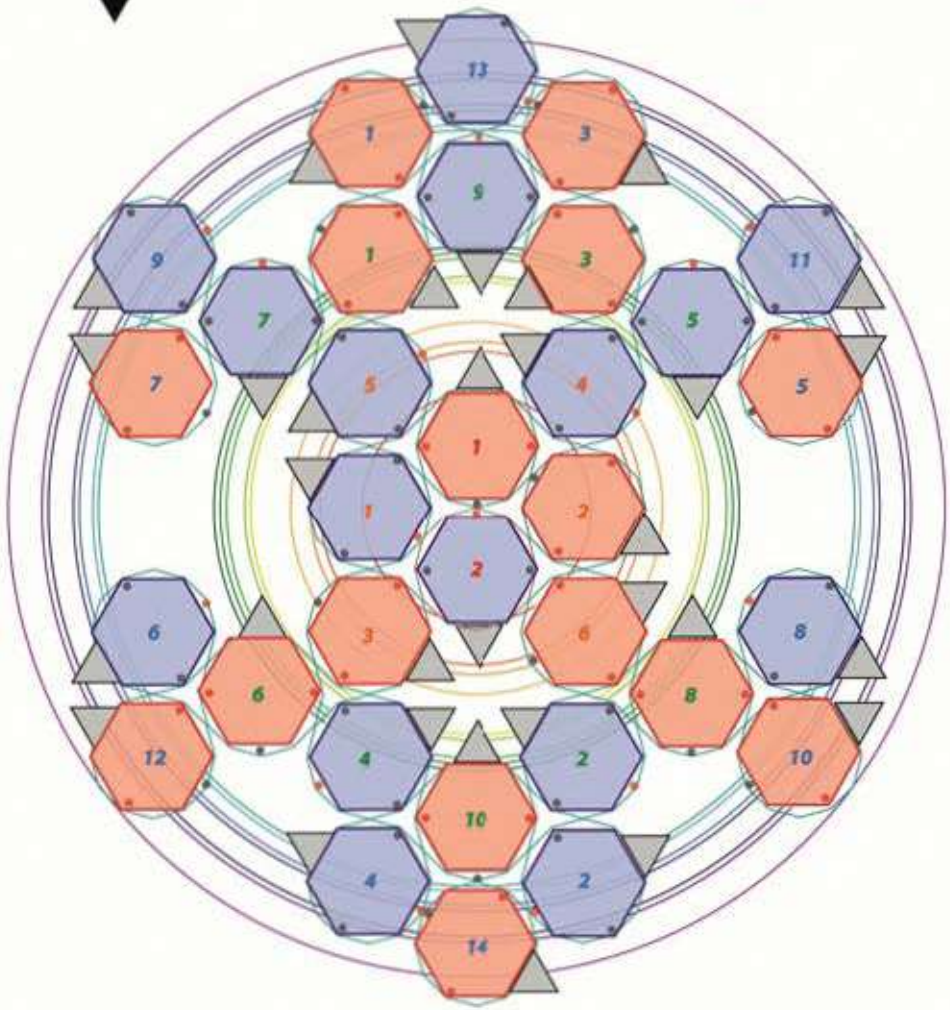
Sub-orbitals fill in order of numbering

Electrons spins pair before next orbital is filled

ie.
p1 [DOWN] and p2 [UP] fill before
p3 [UP] and p4 [DOWN] before
p5 [DOWN] and p6 [UP] etc



Hund's rule of orbital filling must be modified to reflect the true orbital filling order



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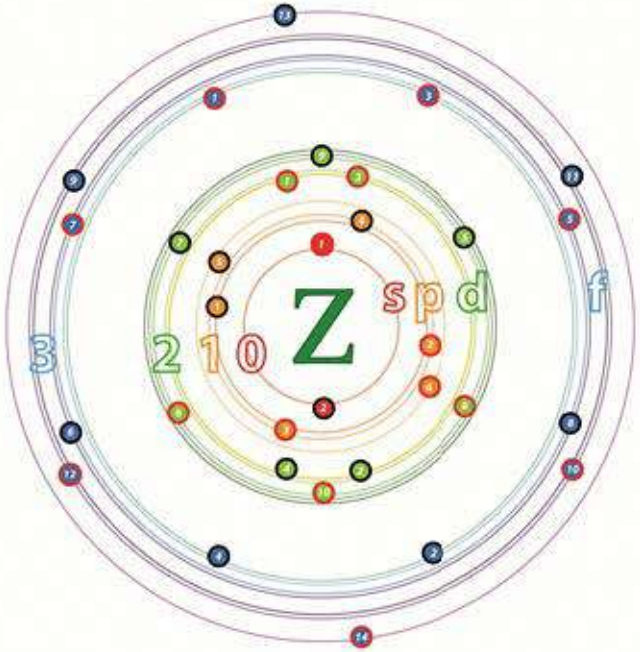
Principle quantum Energies



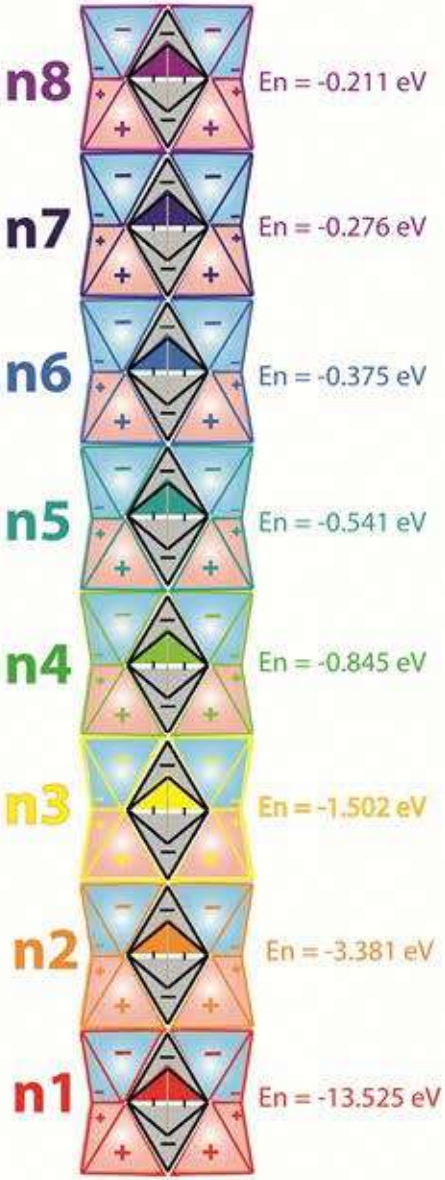
In an atom - electron energies are proportional to their intrinsic Kinetic Energies - which in turn are directly proportional to the quantum energy level of the nuclei which the electron binds to in their respective atomic shells

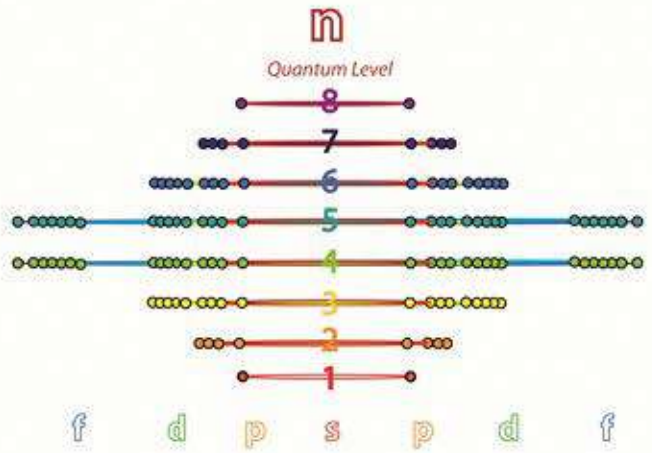
In a nucleus, lower energy orbits have less 'paired' nuclei supplying energy. The more energy you give a nuclei the faster it casuses the bound electron to rotate. If you give the nuclei enough energy, it will impart eneough energy to its electron for it to leave the system entirely.

The same is true for an electron orbital. Higher values of n mean more energy for the electron and the corresponding KEM field enegies of the electron is larger, resulting in increased angular momentum.

Values of n start at 1 and go up by integer amounts.

If enough energy is added to the system by incident Photons a electron will leave the atom creating a positively charged nuclei [ionisation].





s orbits n1-8
p orbits n2-7
d orbits n3-6
f orbits n4-5

Eigenstate value

KEM field energy [per n] required to exceed 13.525 eV at which point the photo-electron has sufficient KE to break free of the Nucleus

$$E_n = \frac{E_1}{n^2} = \frac{-13.6eV}{n^2}, n = 1, 2, 3...$$

The possible Kinetic Energies (quantum levels) of an electron are directly related to the energy level of the Nuclei in each Quantum Level

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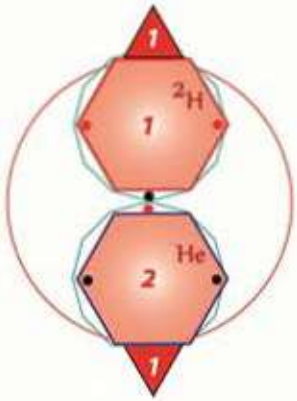
Quantum Level 1

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons	2
1	1s1	Deuterium	1	1	1	
2	1s2	Helium	2	2	2	

Deuterium [not Hydrogen] is the building block of elements



K shell

n1

Ground State electron

$iE = -13.313\ eV$

Z #		Name	Protons	electrons	Neutrons
1	1s1	Hydrogen	1	1	0

Hydrogen is a free radical element

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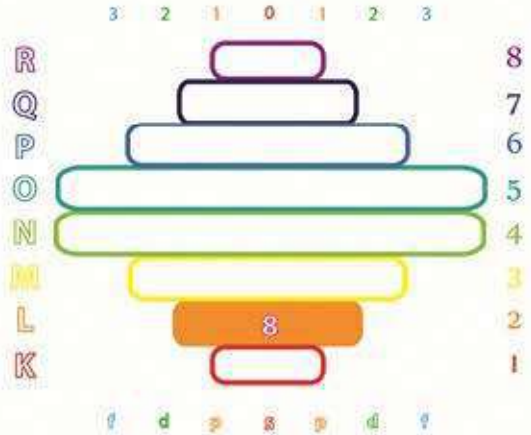
Quantum Level 2

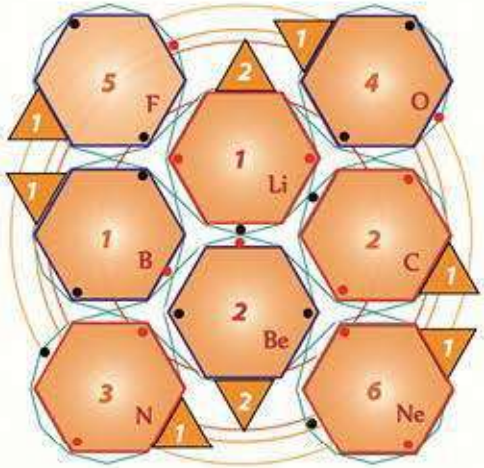
The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
3	2s1	Lithium	3	3	3
4	2s2	Berylium	4	4	4
5	1p1	Boron	5	5	5
6	1p2	Carbon	6	6	6
7	1p3	Nitrogen	7	7	7
8	1p4	Oxygen	8	8	8
9	1p5	Fluorine	9	9	9
10	1p6	Neon	10	10	10

8

Deuterium [not Hydrogen] is the building block of elements



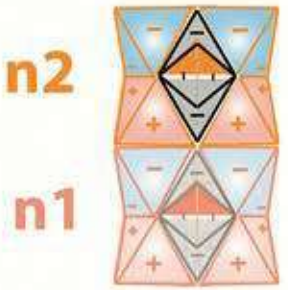


L shell

n2

Ground State electron

$iE = -12.679\ eV$



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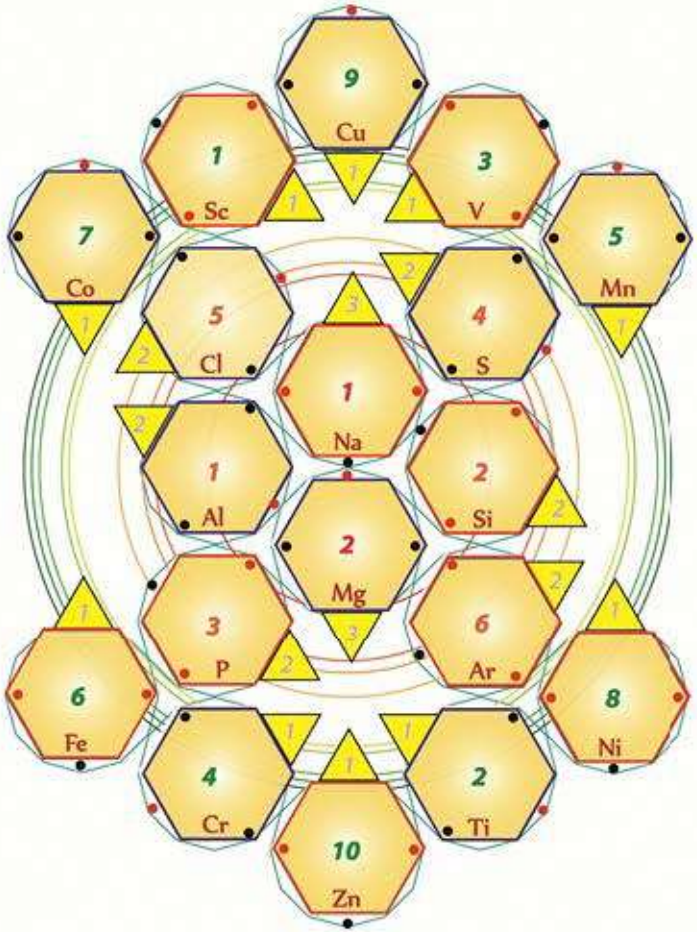
Quantum Level 3

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
11	3s1	Sodium	11	11	11
12	3s2	Magnesium	12	12	12
13	2p1	Aluminium	13	13	13
14	2p2	Silicon	14	14	14
15	2p3	Phosphorus	15	15	15
16	2p4	Sulfur	16	16	16
17	2p5	Chlorine	17	17	17
18	2p6	Argon	18	18	18
21	3d1	Scandium	21	21	21
22	3d2	Titanium	22	22	22
23	3d3	Vanadium	23	23	23
24	3d4	Chromium	24	24	24
25	3d5	Manganese	25	25	25
26	3d6	Iron	26	26	26
27	3d7	Cobalt	27	27	27
28	3d8	Nickel	28	28	28
29	3d9	Copper	29	29	29
30	3d10	Zinc	30	30	30

18

Deuterium [not Hydrogen] is the building block of elements



M shell

n3

Ground State electron

$iE = -11.623\ eV$

Energy level

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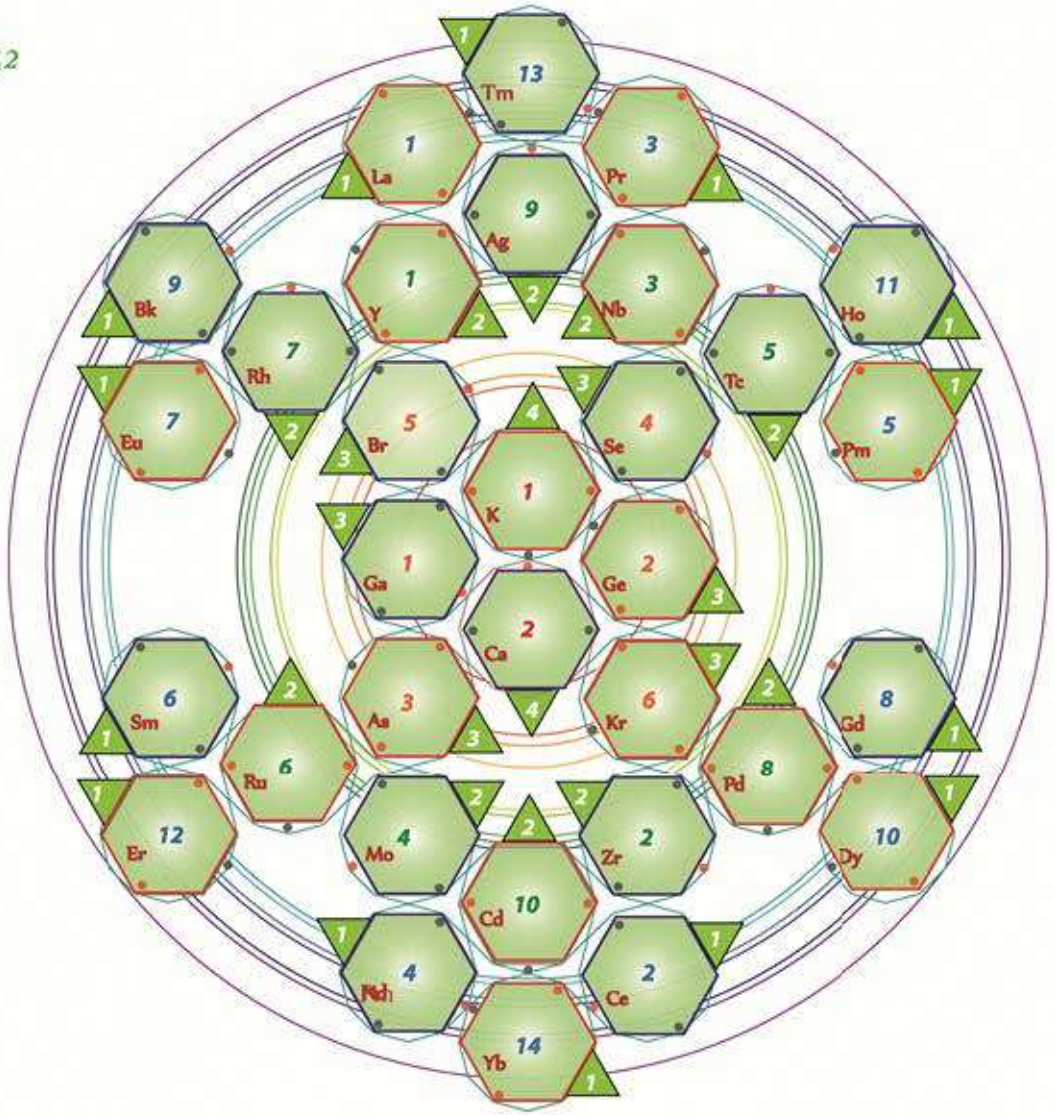
Quantum Level 4

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
19	4s1	Potassium	19	19	19
20	4s2	Calcium	20	20	20
31	4p1	Gallium	31	31	31
32	4p2	Germanium	32	32	32
33	4p3	Arsenic	33	33	33
34	4p4	Selenium	34	34	34
35	4p5	Bromine	35	35	35
36	4p6	Krypton	36	36	36
39	4d1	Yttrium	39	39	39
40	4d2	Zirconium	40	40	40
41	4d3	Niobium	41	41	41
42	4d4	Molybdenum	42	42	42
43	4d5	Technetium	43	43	43
44	4d6	Ruthenium	44	44	44
45	4d7	Rhodium	45	45	45
46	4d8	Palladium	46	46	46
47	4d9	Silver	47	47	47
48	4d10	Cadmium	48	48	48
57	4f1	Lanthanum	57	57	57
58	4f2	Cerium	58	58	58
59	4f3	Praseodymium	59	59	59
60	4f4	Neodymium	60	60	60
61	4f5	Promethium	61	61	61
62	4f6	Samarium	62	62	62
63	4f7	Europium	63	63	63
64	4f8	Gadolinium	64	64	64
65	4f9	Terbium	65	65	65
66	4f10	Dysprosium	66	66	66
67	4f11	Holium	67	67	67
68	4f12	Erbium	68	68	68
69	4f13	Thulium	69	69	69
70	4f14	Ytterbium	70	70	70

32

Deuterium [not Hydrogen] is the building block of elements



N shell

n4

Ground State electron

$iE = -10.143\ eV$

Energy level

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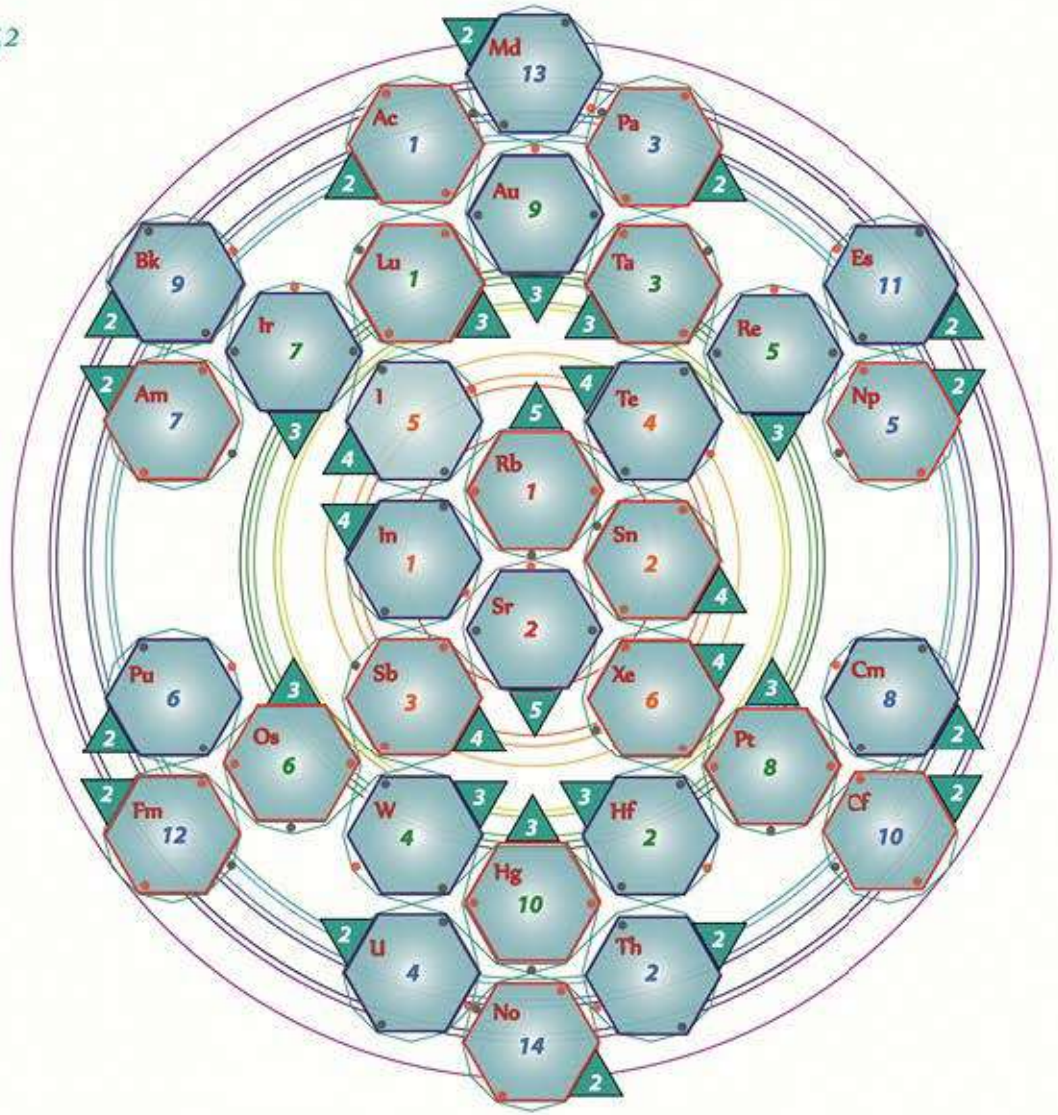
Quantum Level 5

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
37	5s1	Rubidium	37	37	37
38	5s2	Strontium	38	38	38
49	5p1	Indium	49	49	49
50	5p2	Tin	50	50	50
51	5p3	Antimony	51	51	51
52	5p4	Tellurium	52	52	52
53	5p5	Iodine	53	53	53
54	5p6	Xenon	54	54	54
71	5d1	Lutetium	71	71	71
72	5d2	Hafnium	72	72	72
73	5d3	Tantalum	73	73	73
74	5d4	Tungsten	74	74	74
75	5d5	Rhenium	75	75	75
76	5d6	Osmium	76	76	76
77	5d7	Iridium	77	77	77
78	5d8	Platinum	78	78	78
79	5d9	Gold	79	79	79
80	5d10	Mercury	80	80	80
89	5f1	Actinium	89	89	89
90	5f2	Thorium	90	90	90
91	5f3	Protactium	91	91	91
92	5f4	Uranium	92	92	92
93	5f5	Neptunium	93	93	93
94	5f6	Plutonium	94	94	94
95	5f7	Americium	95	95	95
96	5f8	Curium	96	96	96
97	5f9	Berkelium	97	97	97
98	5f10	Californium	98	98	98
99	5f11	Einsteinium	99	99	99
100	5f12	Fermium	100	100	100
101	5f13	Mendelevium	101	101	101
102	5f14	Nobelium	102	102	102

32

Deuterium [not Hydrogen] is the building block of elements



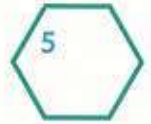
O shell

n5

Ground State electron

$iE = -8.241\ eV$

Energy level



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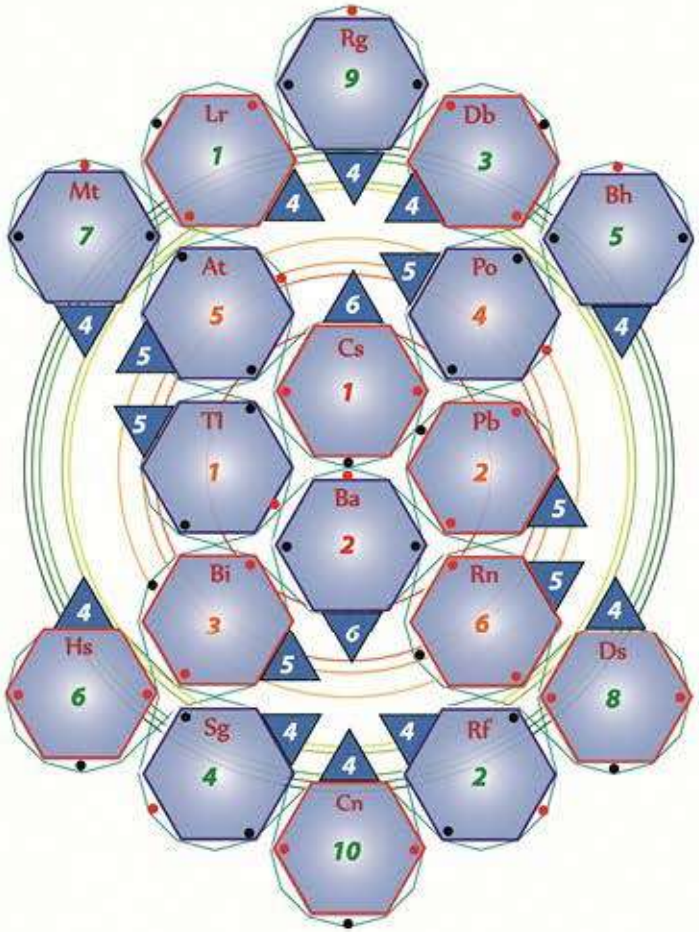
Quantum Level 6

The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
55	6s1	Caesium	55	55	55
56	6s2	Barium	56	56	56
81	6p1	Thallium	81	81	81
82	6p2	Lead	82	82	82
83	6p3	Bismuth	83	83	83
84	6p4	Polonium	84	84	84
85	6p5	Astatine	85	85	85
86	6p6	Radon	86	86	86
103	6d1	Lawrencium	103	103	103
104	6d2	Rutherfordium	104	104	104
105	6d3	Dubnium	105	105	105
106	6d4	Seaborgium	106	106	106
107	6d5	Bohrium	107	107	107
108	6d6	Hassium	108	108	108
109	6d7	Meitnerium	109	109	109
110	6d8	Darmstadtium	110	110	110
111	6d9	Roetgenium	111	111	111
112	6d10	Copernicium	112	112	112

18

Deuterium [not Hydrogen] is the building block of elements

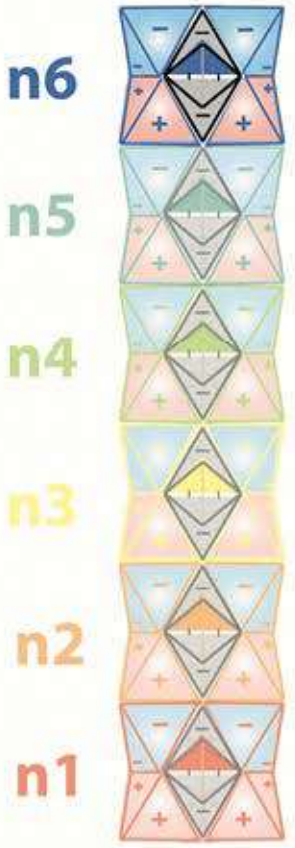


P shell

n6

Ground State electron

$iE = -5.917\ eV$



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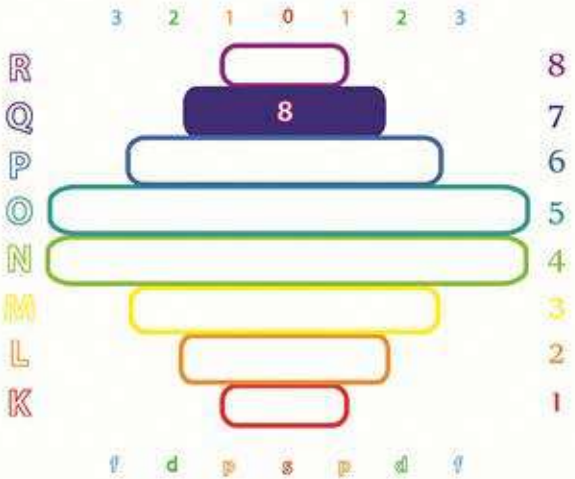
Quantum Level 7

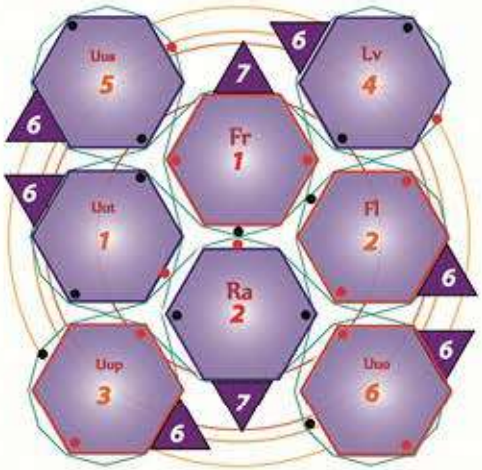
The energy levels of bound electrons is determined by Baryons

Z #		Name	Protons	electrons	Neutrons
87	7s1	Francium	87	87	87
88	7s2	Radium	88	88	88
113	7p1	Ununtrium	113	113	113
114	7p2	Flerovium	114	114	114
115	7p3	Ununpentium	115	115	115
116	7p4	Livermorium	116	116	116
117	7p5	Ununseptium	117	117	117
118	7p6	Ununoctium	118	118	118

8

Deuterium [not Hydrogen] is the building block of elements





Energy level

Q shell

n7

Ground State electron

$iE = -3.169\ eV$

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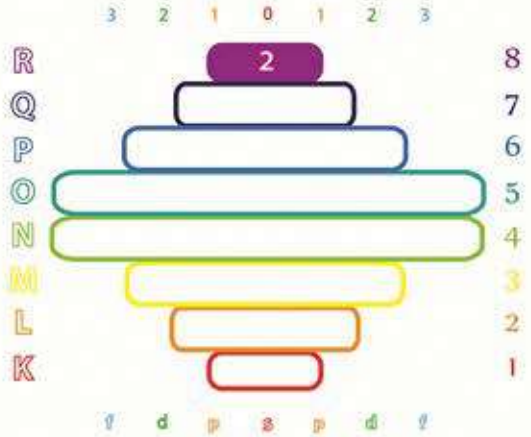
Quantum Level 8

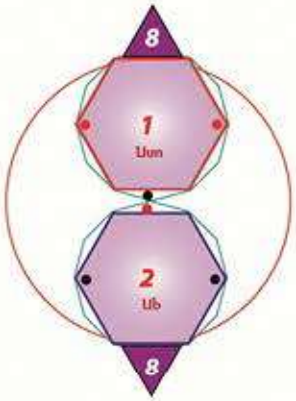
The energy levels of bound electrons is determined by Baryons

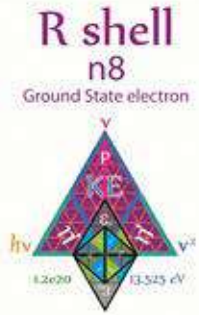
Z #		Name	Protons	electrons	Neutrons
119	8s1	Ununnonium	119	119	119
120	8s2	Unbinilium	120	120	120

2

Deuterium [not Hydrogen] is the building block of elements







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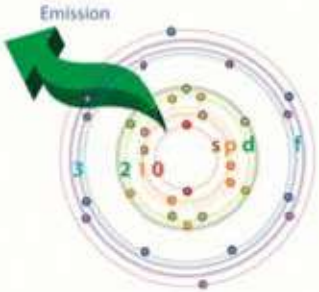
Spectral line transitions

8 un-named
7 Humphries
6 Pfund
5 Brackett
4 Paschen
3 Balmer
2 Lyman
1

Quantum level jumps



Quantum Level Jumps

Photon Absorption and Release

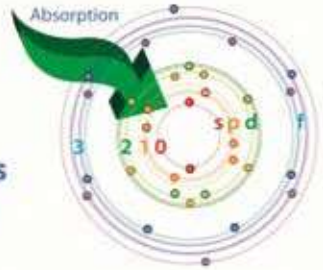


Photo-electrons can only transition between principal energy Baryons in the atomic nuclei in discrete steps [or quantum jumps] because Baryons determine the KEM energy levels of electrons in nuclei

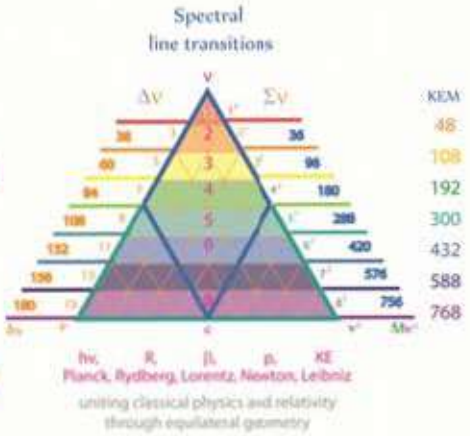
[see Tetryonic QED for full details on spectral line mechanics]

Initial Quantum level									
8	768	756	720	660	576	468	336	180	0
7	588	576	540	480	396	288	156	0	
6	432	420	384	324	240	132	0		
5	300	288	252	192	108	0			
4	192	180	144	84	0				
3	108	96	60	0					
2	48	36	0						
1	12	0							
		12	48	108	192	300	432	588	768
		1	2	3	4	5	6	7	8

Final Quantum level

$$\Delta p = \Delta M v = hf$$

accelerating photo-electrons produce spectral lines



Nuclear energy emission~absorption

If atoms are left undisturbed, their electrons usually fill the lowest available energy levels and stay there, in their "ground state."

Occasionally, however, they may also be pushed up to some higher energy ("become excited") e.g. by a collision with a fast atom or electron, one which got extra speed from an electric voltage or from some source of heat.

An atom/electron elevated to one of its higher "excited levels" soon falls back to a lower level ("undergoes a quantum jump"), emitting a photon whose energy corresponds to the difference between the levels.

That need not be the ground state: the atom/electron might descend to that state in several steps, emitting a photon at each step on the way.

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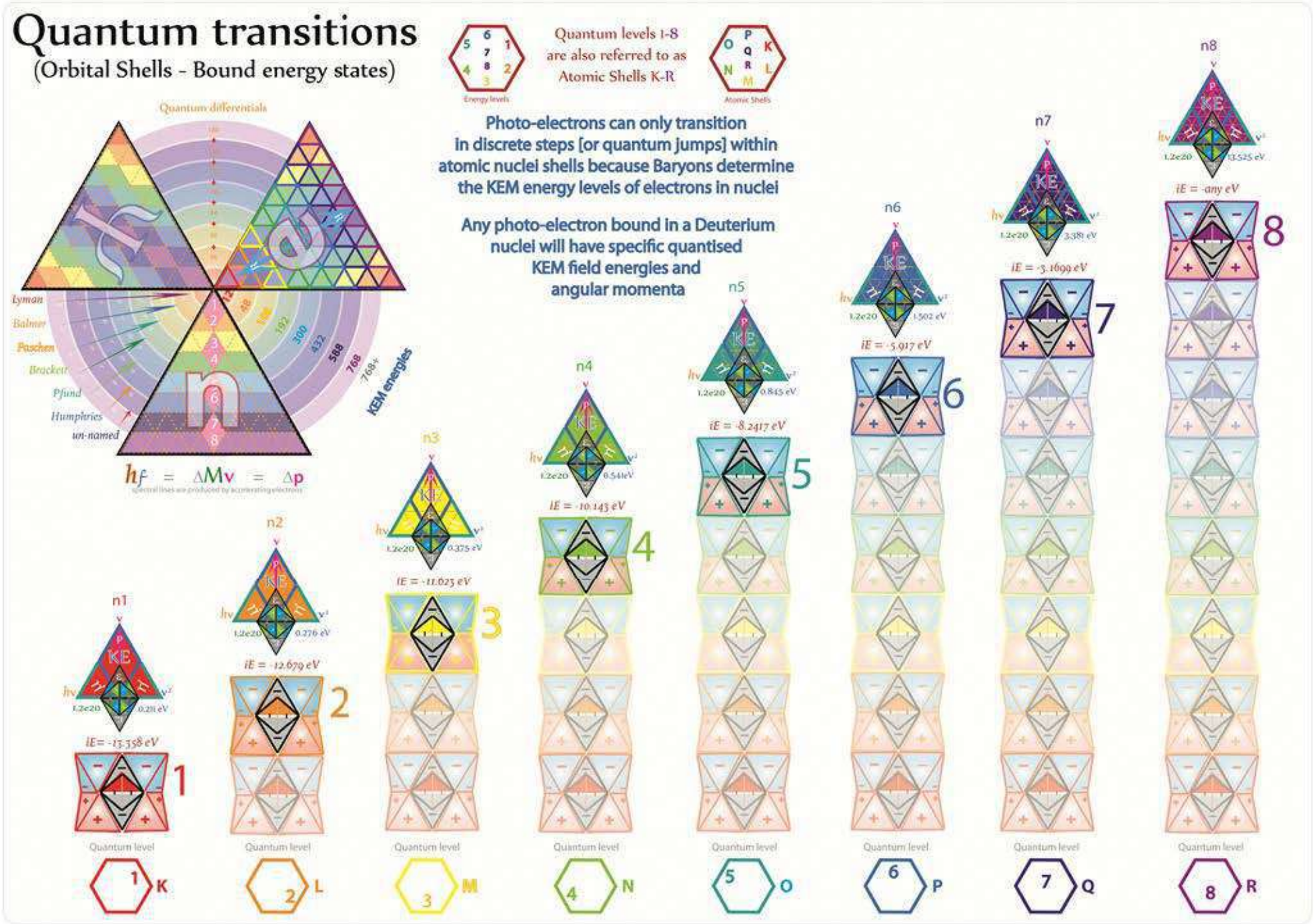

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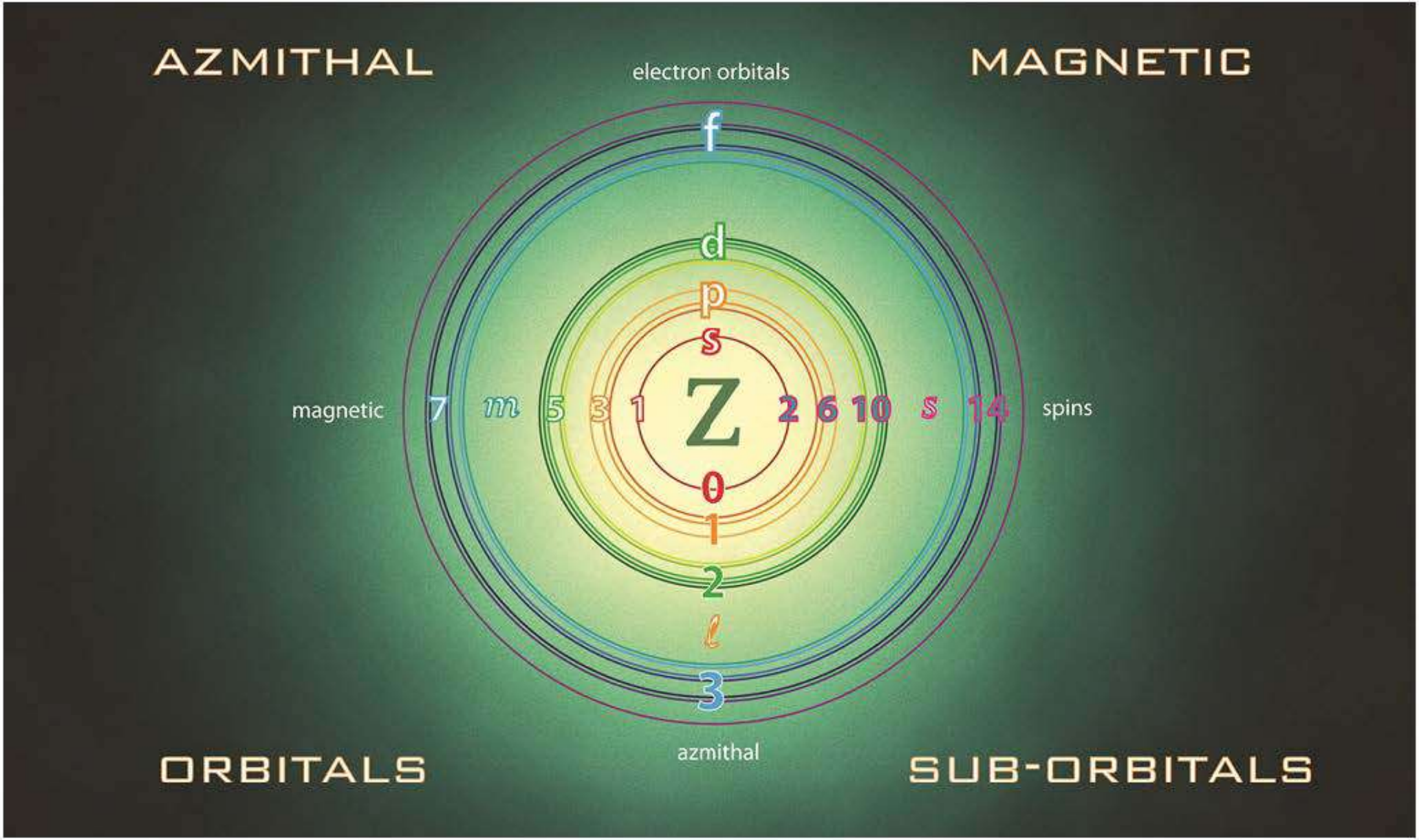

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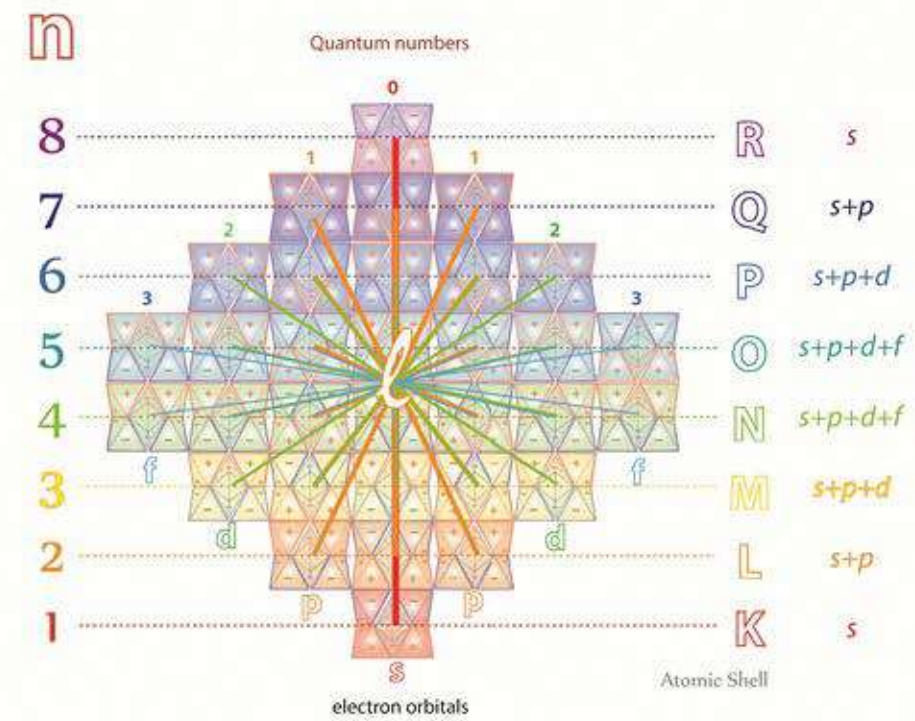
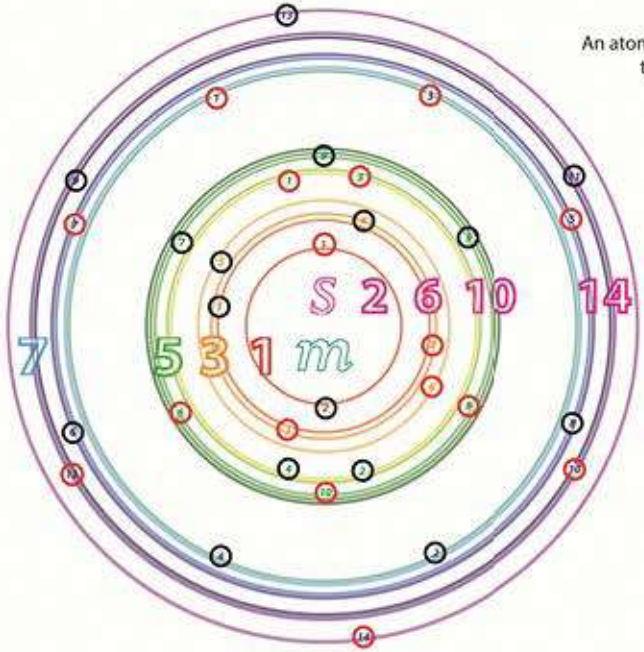
Atomic Orbitals





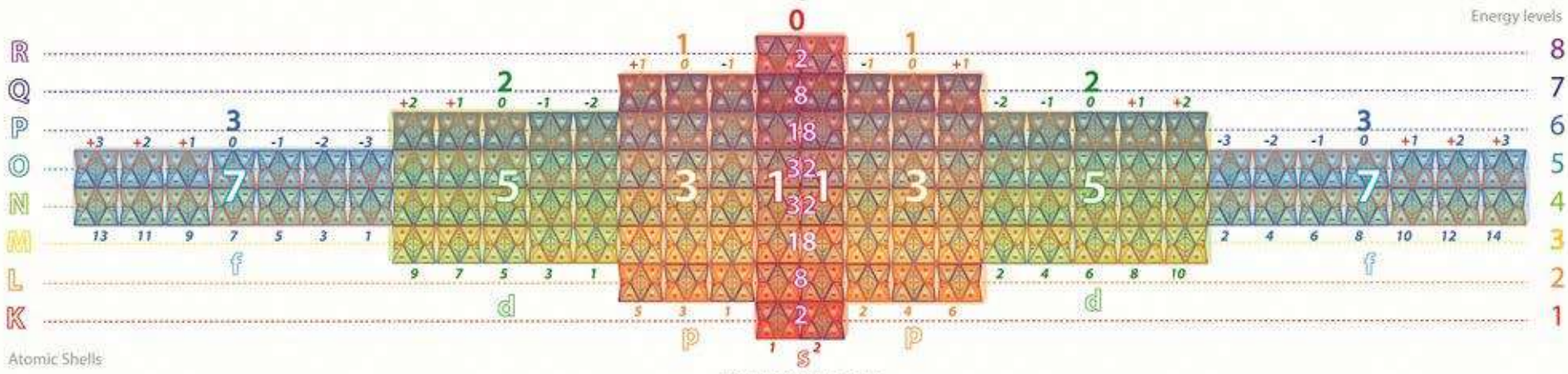
An atomic orbital is a mathematical function that describes the wave-like behavior of either one electron or a pair of electrons in an atom

Atomic orbitals are typically categorized by n, l, and m quantum numbers, which correspond to the electron's energy, angular momentum, and an angular momentum vector component, respectively.

Historically used to define the pedagogical electron cloud model of an atom Tetryonics reveals the true geometry of atomic nuclei

Each orbital is defined by a different set of quantum numbers and contains a maximum of two spin opposed electrons.

Aufbau



Electron Spins can be either up or down providing they obey the Pauli exclusion principle

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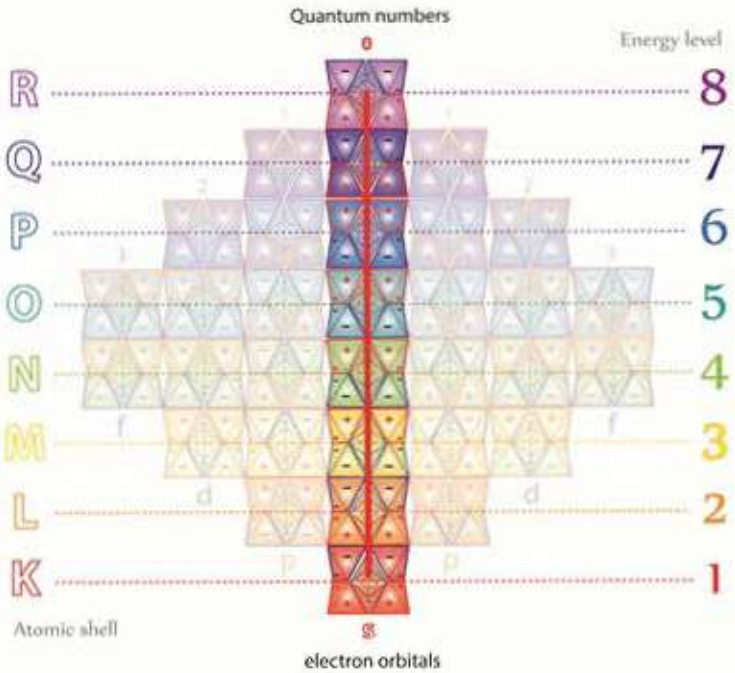
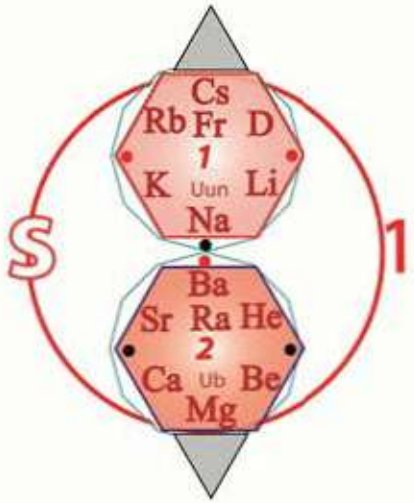
s Orbital

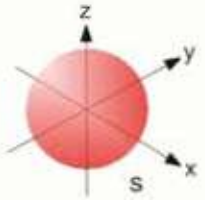
1 Orbit (2 electrons max)



		n
azmithal number	0	ℓ
magnetic numbers	0	m
spins	-1/2 +1/2	s

Alkali Metals & Alkali Earths





erroneous computer model of 's' electron orbitals

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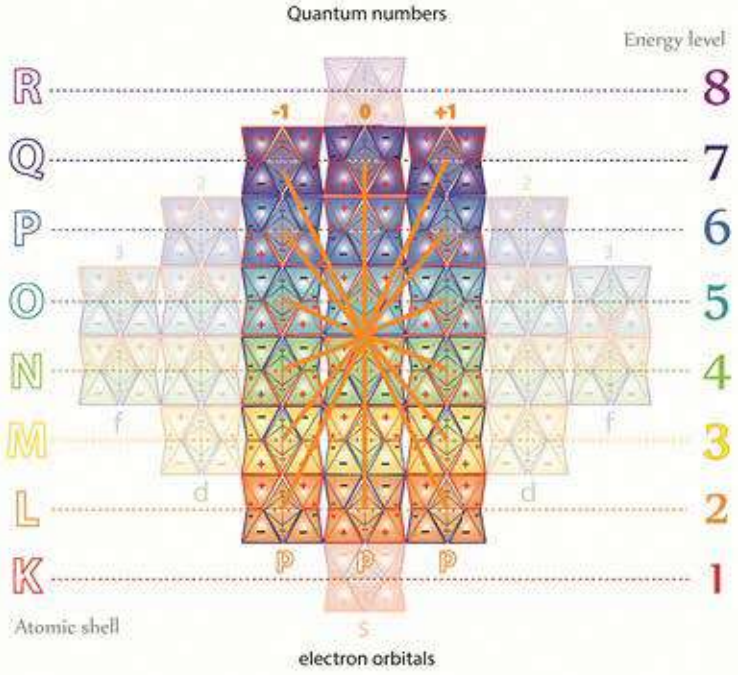
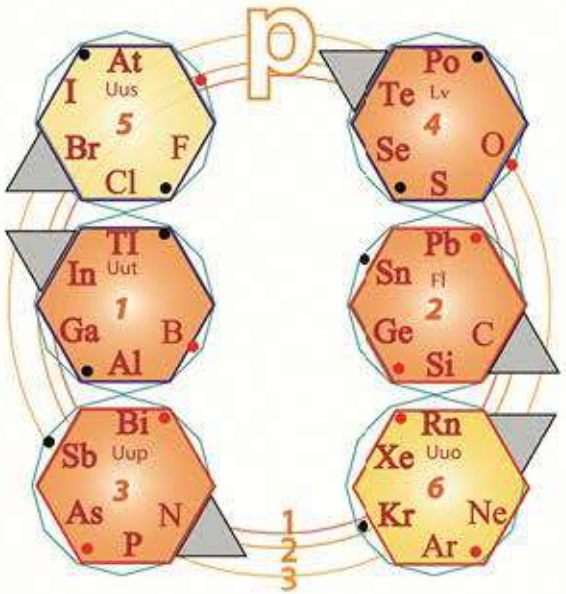
p Orbital

3 Orbits (6 electrons max)

Non-Metals, Halogens & Nobel gases





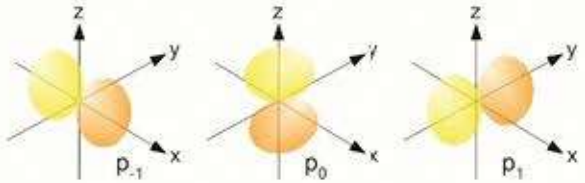
azmithal number	1		
magnetic numbers	-1	0	+1
spins	-1/2	-1/2	-1/2
	+1/2	+1/2	+1/2

n

ℓ

m

s



erroneous computer model of 'p' electron orbitals

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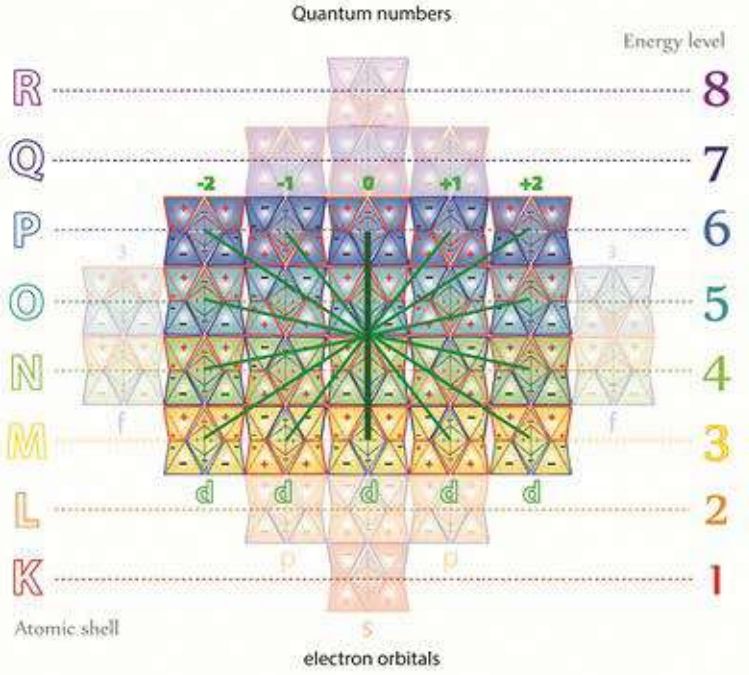
d Orbital

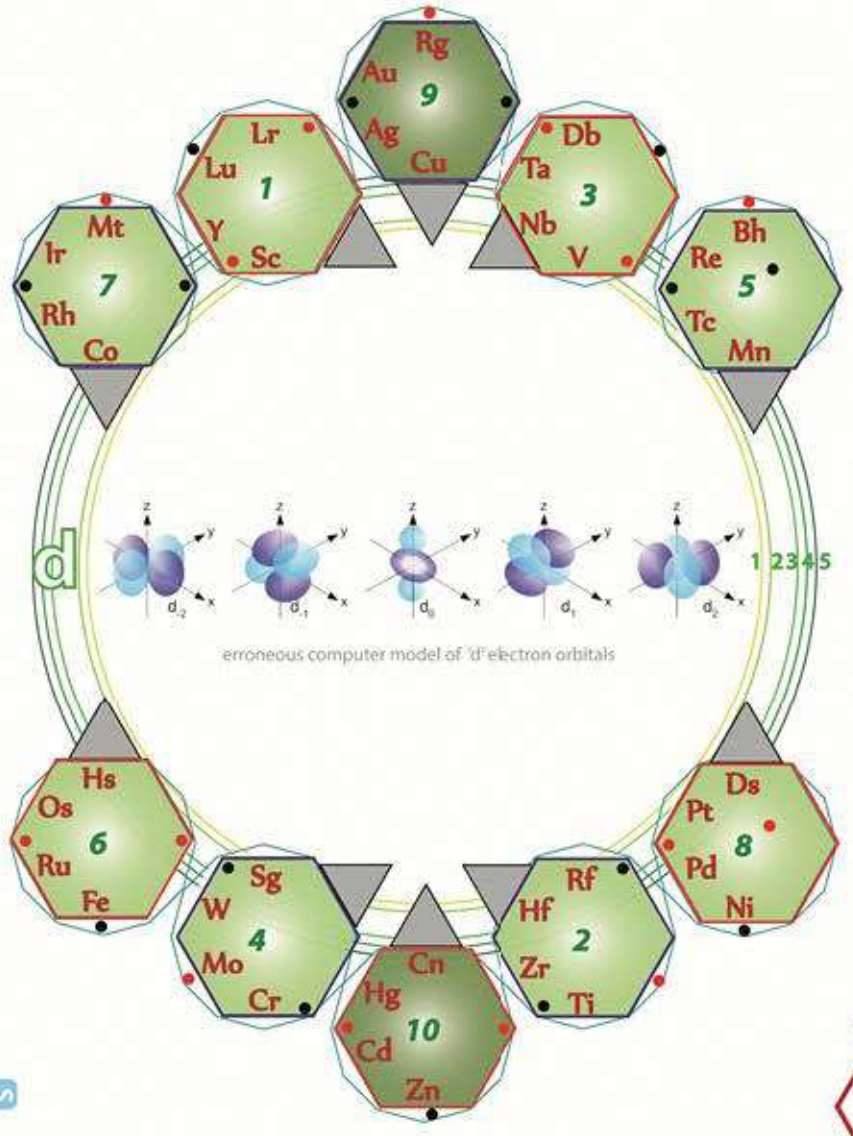
5 Orbits (10 electrons max)



azmithal number			2			ℓ
magnetic numbers	-2	-1	0	+1	+2	m
spins	-1/2	-1/2	-1/2	-1/2	-1/2	s
	+1/2	+1/2	+1/2	+1/2	+1/2	

n

Transition & post-Transition Metals



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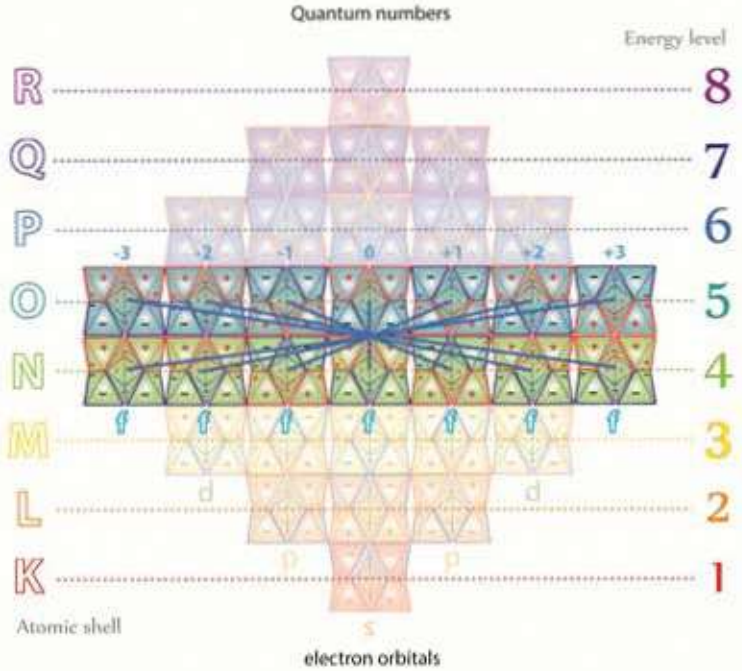
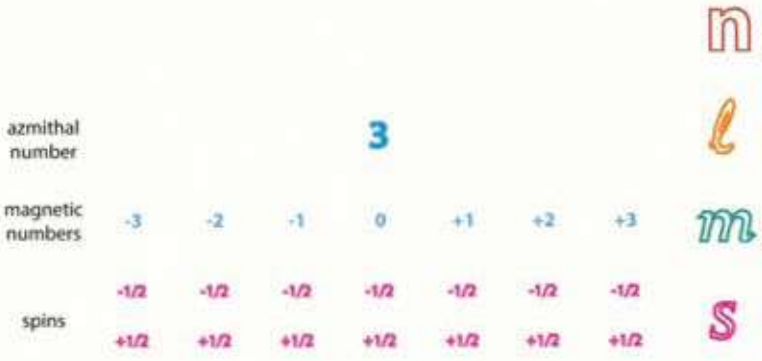
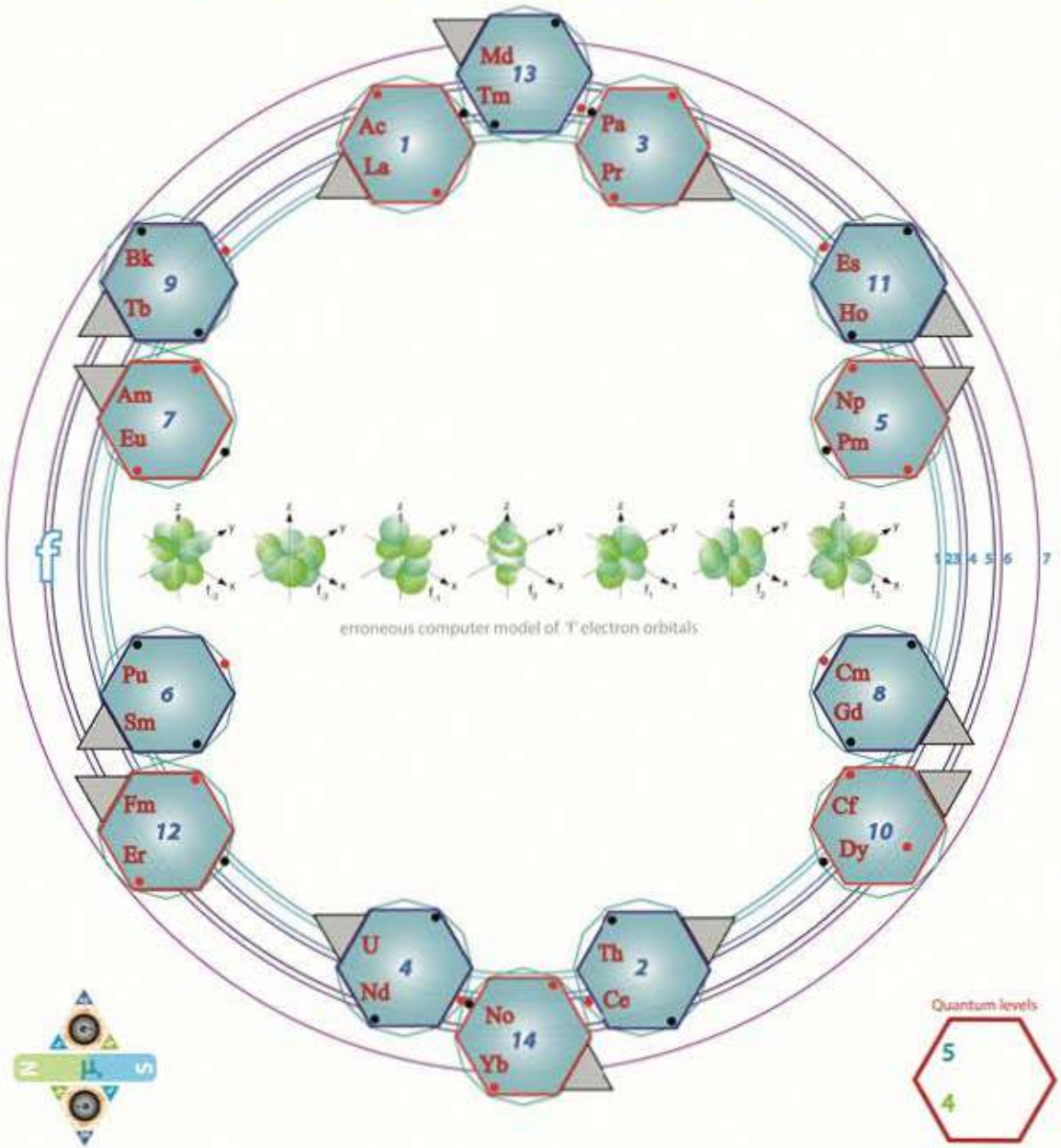
f Orbital

7 Orbits (14 electrons max)





Lanthanoids & Actinoids



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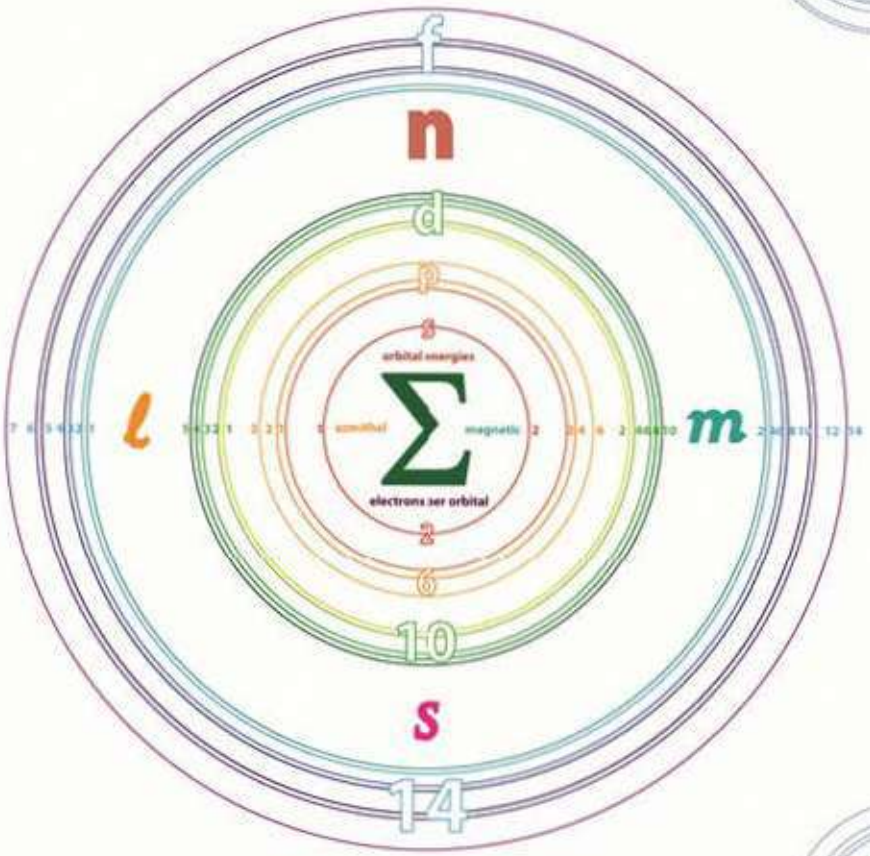
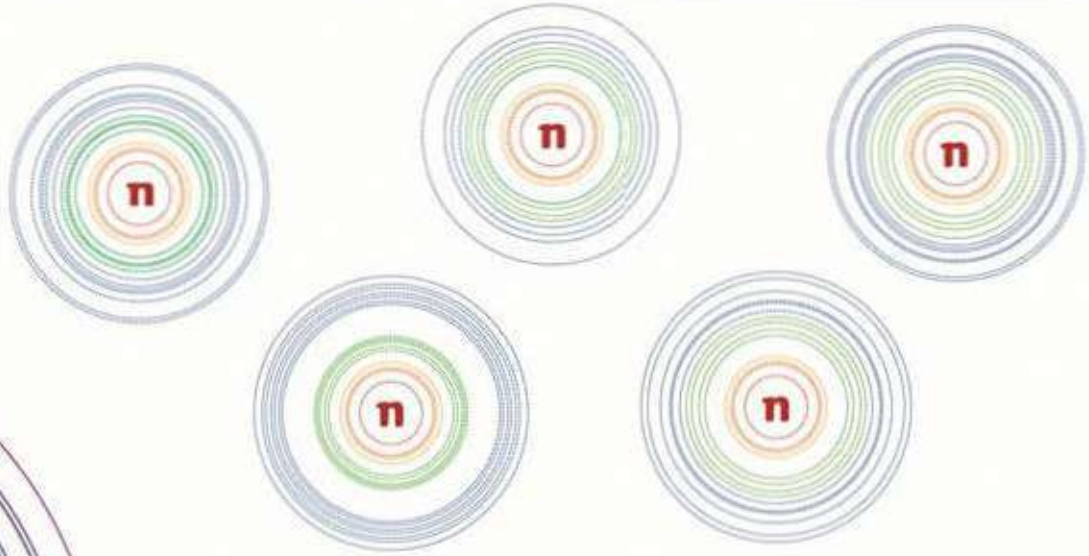
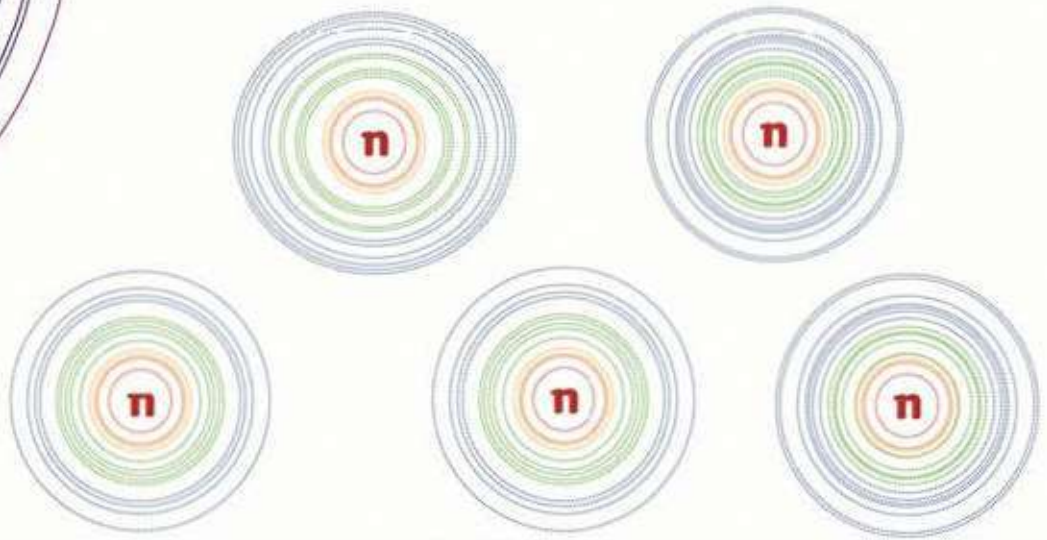
Orbital energy variations

All Elements have stable core electron configurations of s & p orbitals for each energy level as revealed through diffraction studies





As additional nuclei bind to form d & f orbitals they can do so by bonding in many positions, with each location producing different orbital energies for each electron that binds to nuclei in that position



The final energy levels of each orbital is the result of the energy of the Baryons in the nuclei and the spin coupling energies of the photo-electrons bound to them

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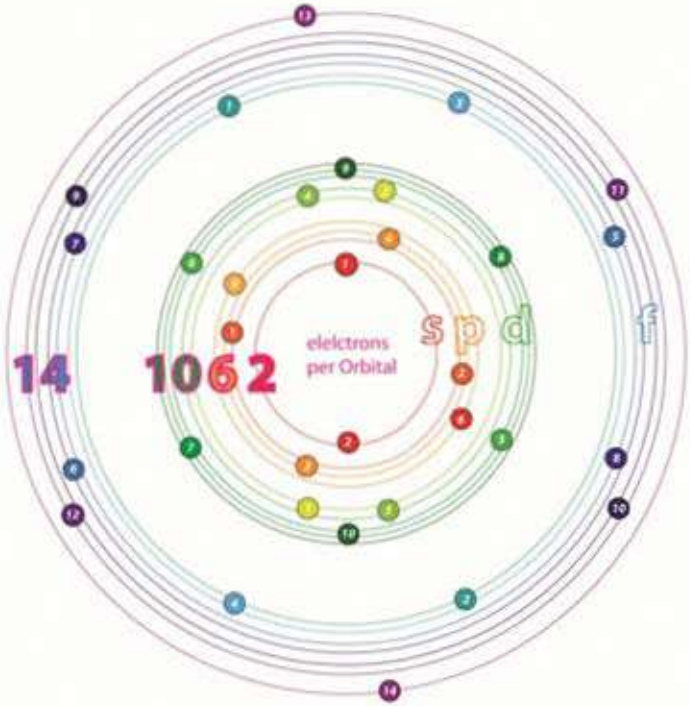
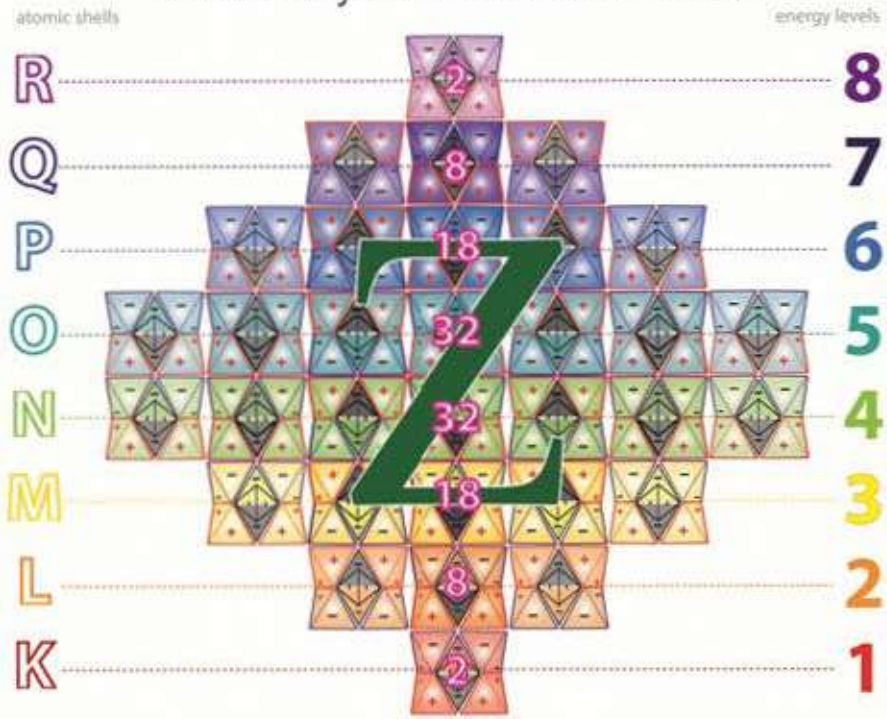
Electrons per shell



Each energy shell of a periodic element can hold only a fixed number of electrons



Atomic Orbitals

f	d	p	s	p	d	f
5, 11, 3, 13, 1, 9, 7	8, 2, 10, 4, 6	5, 1, 3	1-2	6, 2, 4	7, 1, 9, 3, 5	6, 12, 4, 14, 2, 10, 8

7 + 5 + 3 + 2 + 3 + 5 + 7

Rules governing the allowed combinations of Quantum Numbers

The three quantum numbers (n, l, and m) that describe an orbital are integers: 0, 1, 2, 3, and so on

n (1-8) Principal	The principal quantum number (n) cannot be zero.
ℓ (0-3) Azimuthal	The angular quantum number (l) can be any integer between 0 and n - 1.
$m\ell\ (2\ell+1)$ Magnetic	The magnetic quantum number (m) can be any integer between -l and +l.
$m_s \pm \frac{1}{2}$ Spin Projection	The Spin of electrons in any nuclear sub-orbital can only be +1/2 (Spin UP) or -1/2 (Spin DOWN).

Z

1, 2, 3, 4, 5, 6, 7, 8

s, p, d, f

1	2
1, 3, 5	2, 4, 6
1, 3, 5, 7, 9	2, 4, 6, 8, 10
1, 3, 5, 7, 9, 11, 13	2, 4, 6, 8, 10, 12, 14
down up	up down

Quantum Numbers

n	4-5	3-6	2-7	1-8	2-7	3-6	4-5
ℓ	3	2	1	0	1	2	3
m	-3	-2	-1	1	+1	+2	+3
s	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2	+1/2 -1/2

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Using Tetryonic charged geometries for mass-ENERGY-Matter,
an electron's position and velocity CAN be modelled simultaneously
(but any attempt to measure or interact with it, will affect its component energy-momenta)

Electron Position Uncertainty

Atomic orbitals are typically described as "hydrogen-like" (meaning one-electron) wave functions over any spatial region of measurement, categorized by n, l, and m quantum numbers, which correspond to the electron's energy, angular momentum, and a vector momentum component, respectively

Erwin Schrödinger

(12 August 1887 – 4 January 1961)

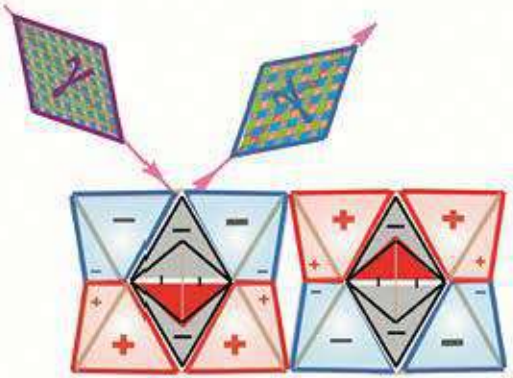
Werner Heisenberg

(5 December 1901 – 1 February 1976)

Lepton's are physically Spin 1 fermion particles that can easily be misconstrued as having entirely different spin numbers without the correct physical topologies to base the observed measurements on

Quantum Mechanics is a mathematical representation of equilateral energy momenta interactions and the charged geometries of mass-ENERGY-Matter

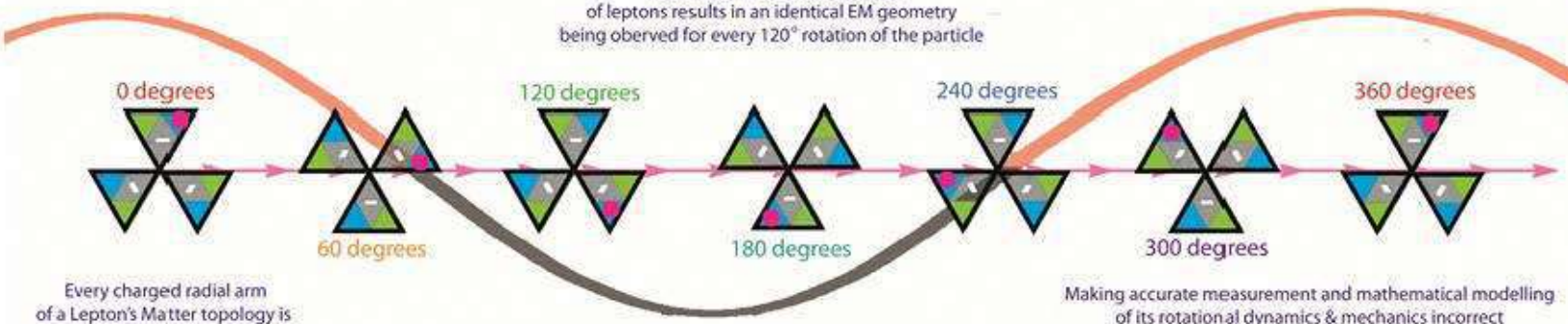
Determining the motion of electrons bound to atomic nuclei is akin to measuring the motion of variable speed electric fan blades mounted at various heights within a rotating carousel



The energies of photo-electrons are determined by the Baryons they bind to & incident photons

Leptons are 12 loop quantum rotors

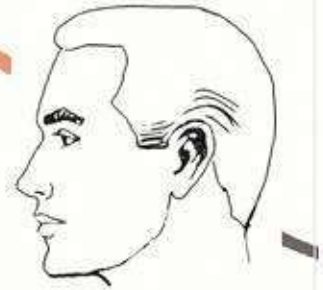
The unique 12 faceted topology
of leptons results in an identical EM geometry
being oberved for every 120° rotation of the particle



Every charged radial arm
of a Lepton's Matter topology is
identical to every other

Making accurate measurement and mathematical modelling
of its rotational dynamics & mechanics incorrect
without the correct physical topologies

Leading to the interpretation that
the Lepton disappears and re-appears
when being 'observed' or measured



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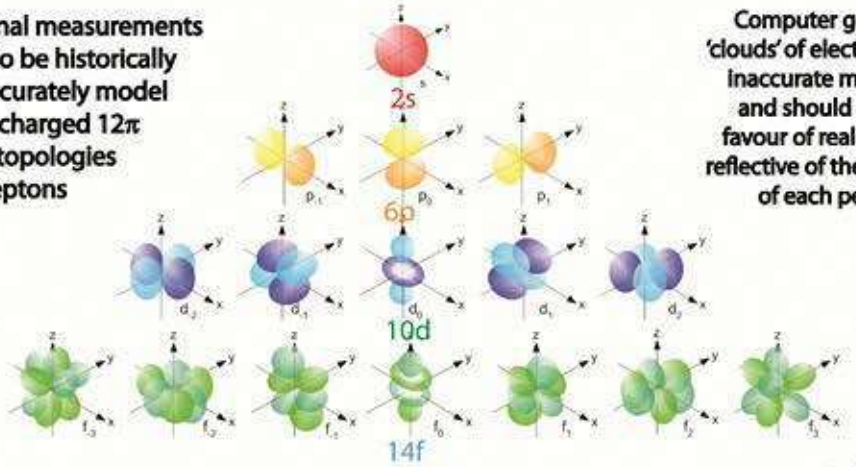
Electron modelling & probability calculations

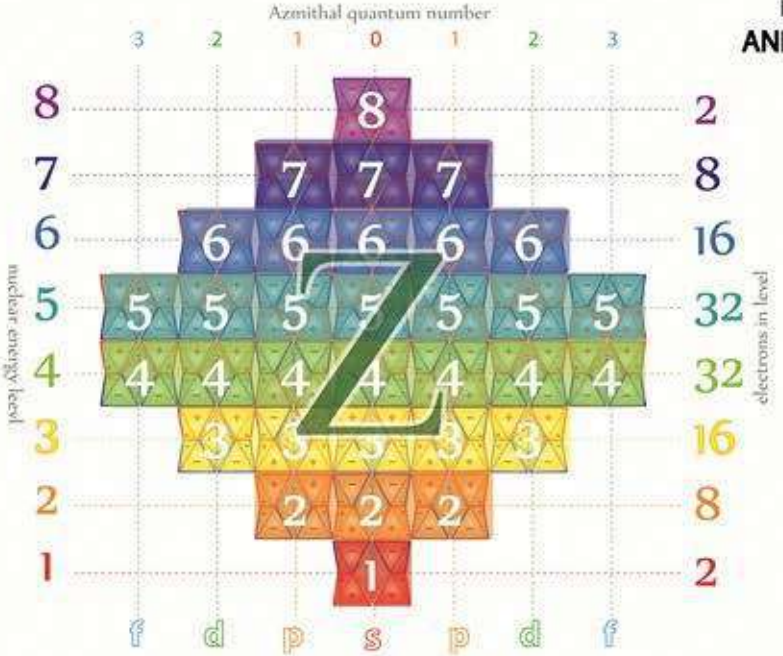
Electron positional measurements have proven to be historically difficult to accurately model due to the charged 12π rotating topologies of leptons



Computer generated plots of 'clouds' of electron probabilites are inaccurate mis-representations and should be abandoned in favour of realistic atomic models reflective of the charged geometry of each periodic element

Every elemental atom can be viewed as a quantum carousel with a unique number of oscillating fans positioned around it.

Each fan has 3 blades and a fixed speed n[1-8] related to its height above ground level, AND the carousel is turning around on its axis



All periodic elements are made form Deuterium nuclei

The baryonic energies of nuclei determines the energies of bound photo-electrons

The current computer generated electron probability diagrams in popular use at present can now be show to be a misrepresentative model of mathematical modelling of electron sub-orbital energies

The nuclear quantum levels [n], intrinsic quantised angular momentum [h] and orbital angular momentum [l] of each electron bound within atomic nuclei are all the direct result of the Baryonic energies of the nuclei they are bound to

Each level of the quantum carousel can contain only a limited number of fans each running at a specific speed

Imagine trying to measure (or model) the motion of any 1 quantum scale blade while the carousel rotates

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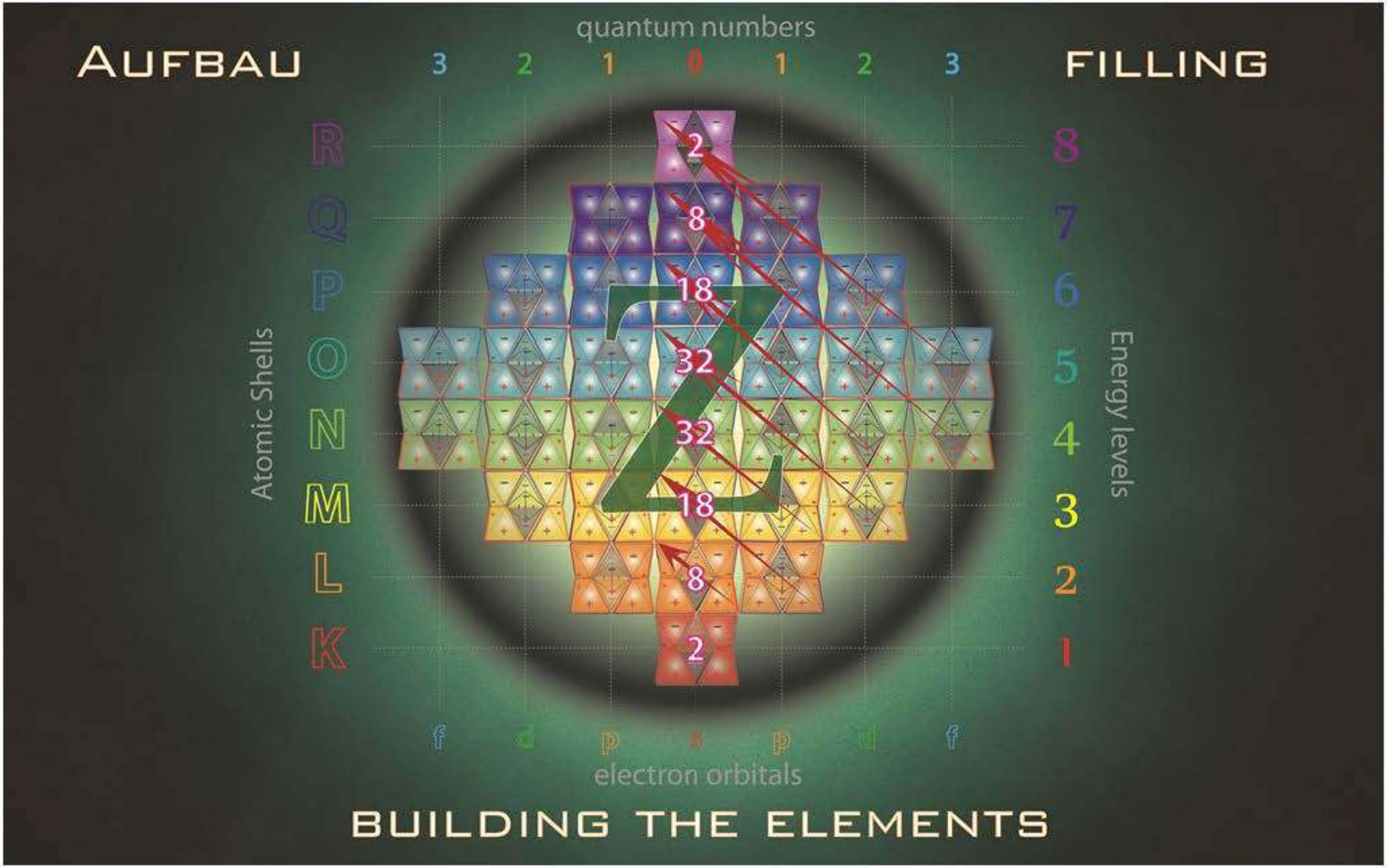

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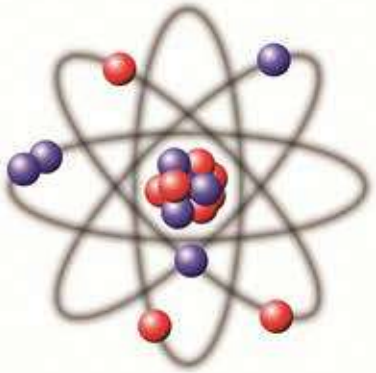
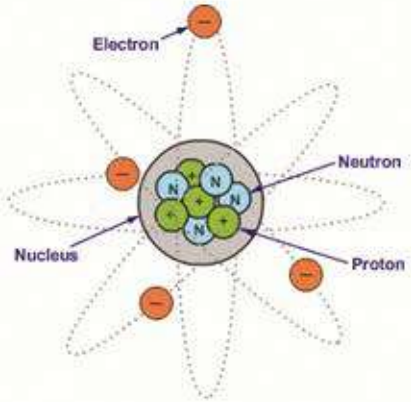
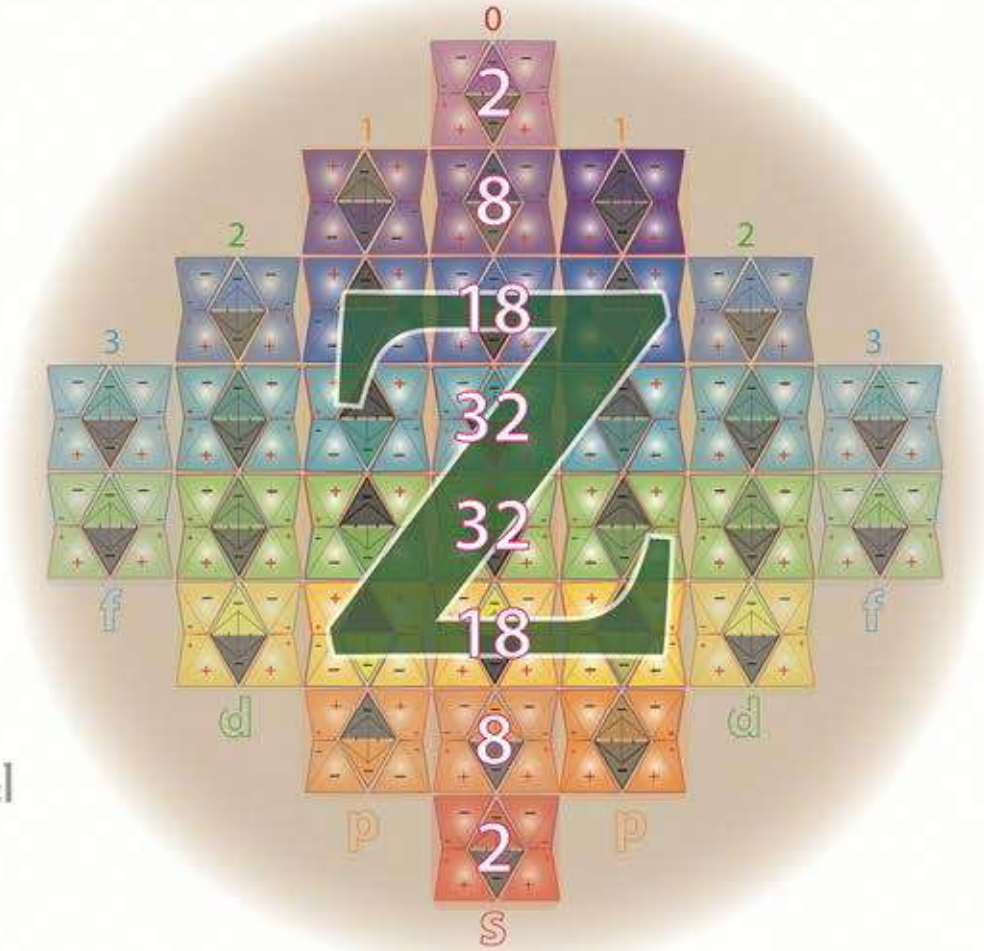
Quantum Topologies





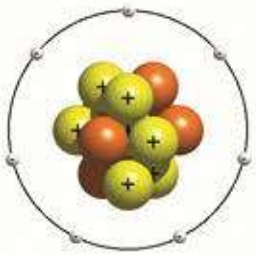
Dalton Model

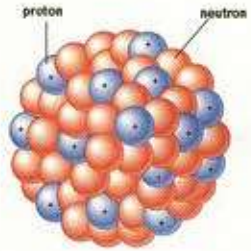


Quantum Model

Thomson Model

Rutherford Model





Historically viewed as a spherical object
Tetryonic charge geometry has finally revealed the
true quantum topology of all atoms

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Element numbers

The rule dictating how many nuclei form each Atomic shell is known as the Aufbau principle.

The physical and chemical properties of elements is determined by the atomic structure. The atomic structure is, in turn, detemined by the electrons and which shells, subshells and orbitals they reside in.

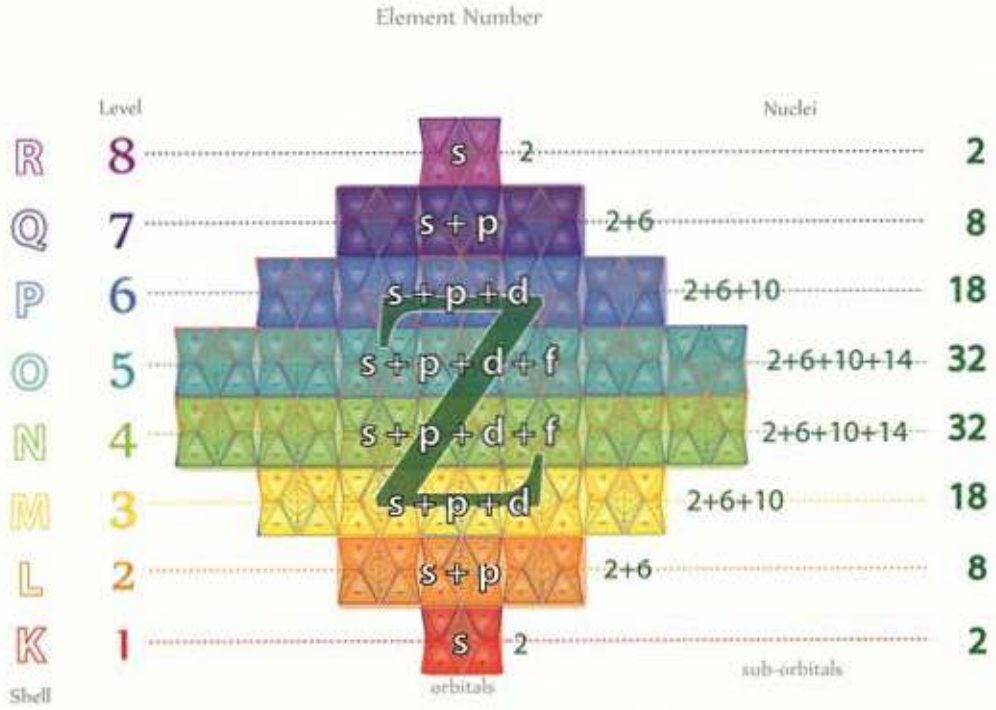
The maximum periodic elemental number is 120

$$Z = \sum_{1}^{1\,2\,3\,4\,4\,3\,2\,1} 2(n^2) = 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2$$

Number of nuclei per level	Element #
2	120
+	119
8	118
+	111
18	110
+	93
32	92
+	61
32	60
+	29
18	28
+	11
8	10
+	3
2	2
	1

The number of nuclei per quantum level is reflective of photonic energy levels and provides the foundational geometry for all of the periodic elements

The number of possible nuclei in each Quantum level follows aufbau principle 'numbers' which can be determined using the following summation formula


Element Number
Level
Nuclei
R 8 s 2 2
Q 7 s + p 2+6 8
P 6 s + p + d 2+6+10 18
O 5 s + p + d + f 2+6+10+14 32
N 4 s + p + d + f 2+6+10+14 32
M 3 s + p + d 2+6+10 18
L 2 s + p 2+6 8
K 1 s 2 2
Shell
orbitals
sub-orbitals

Deuterium is the building block of all elements

Each element has equal numbers of Protons, electron & Neutrons with their stored mass-energies making up the molar masses of elements not excess neutron as currently modelled

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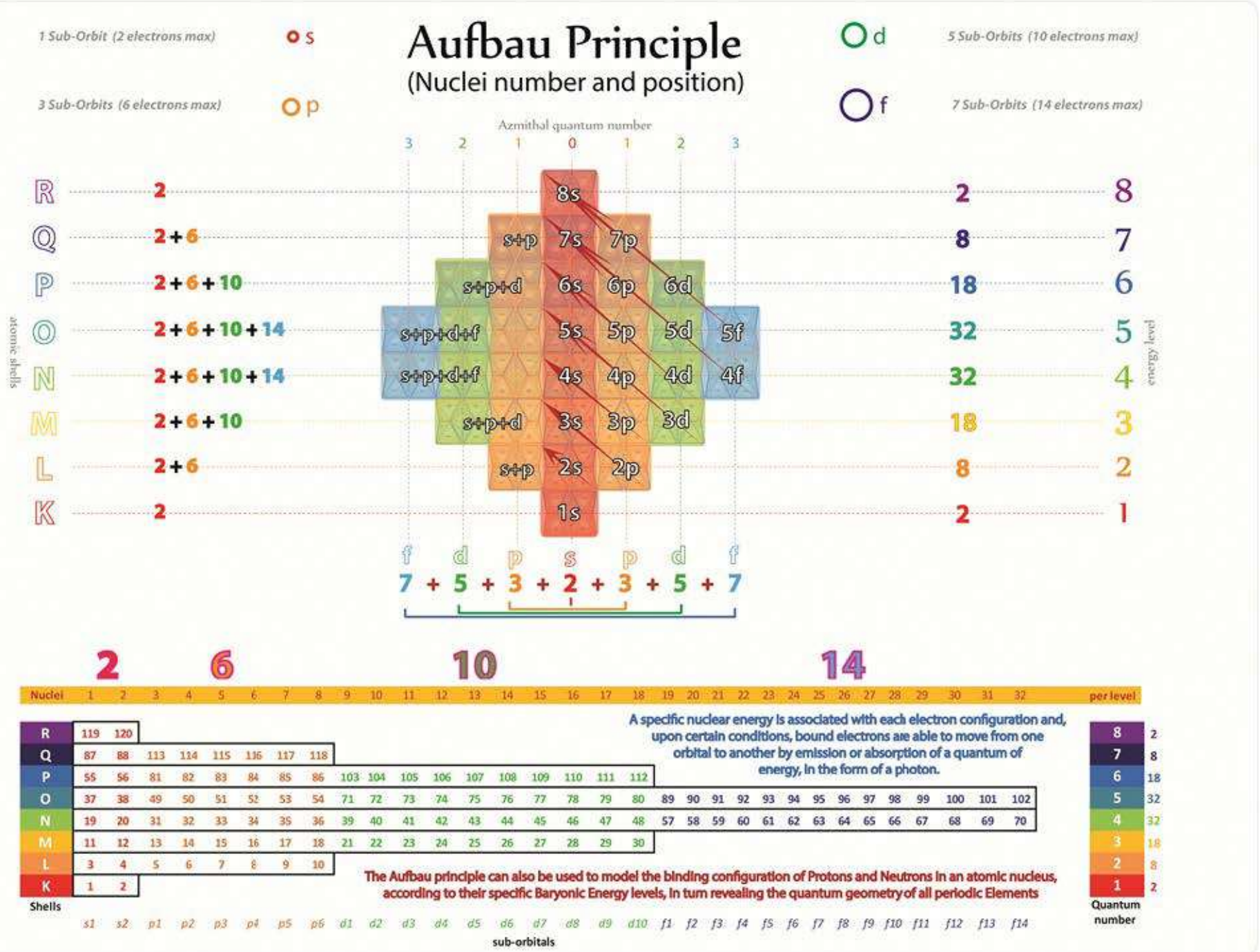
Aufbau Principle
(Nuclei number and position)
1 Sub-Orbit (2 electrons max)
s
3 Sub-Orbits (6 electrons max)
p
d
5 Sub-Orbits (10 electrons max)
f
7 Sub-Orbits (14 electrons max)
Azmithal quantum number
3 2 1 0 1 2 3
R 2
Q 2+6
P 2+6+10
O 2+6+10+14
N 2+6+10+14
M 2+6+10
L 2+6
K 2
atomic shells
8s
s+p 7s 7p
s+p+d 6s 6p 6d
s+p+d+f 5s 5p 5d 5f
s+p+d+f 4s 4p 4d 4f
s+p+d 3s 3p 3d
s+p 2s 2p
1s
2 8
8 7
18 6
32 5
32 4
18 3
8 2
2 1
energy level
f d p s p d f
7 + 5 + 3 + 2 + 3 + 5 + 7
2 6 10 14
Nuclei 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 per level
R 119 120
Q 87 88 113 114 115 116 117 118
P 55 56 81 82 83 84 85 86 103 104 105 106 107 108 109 110 111 112
O 37 38 49 50 51 52 53 54 71 72 73 74 75 76 77 78 79 80 89 90 91 92 93 94 95 96 97 98 99 100 101 102
N 19 20 31 32 33 34 35 36 39 40 41 42 43 44 45 46 47 48 57 58 59 60 61 62 63 64 65 66 67 68 69 70
M 11 12 13 14 15 16 17 18 21 22 23 24 25 26 27 28 29 30
L 3 4 5 6 7 8 9 10
K 1 2
Shells
s1 s2 p1 p2 p3 p4 p5 p6 d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 f1 f2 f3 f4 f5 f6 f7 f8 f9 f10 f11 f12 f13 f14
sub-orbitals
A specific nuclear energy is associated with each electron configuration and, upon certain conditions, bound electrons are able to move from one orbital to another by emission or absorption of a quantum of energy, in the form of a photon.
The Aufbau principle can also be used to model the binding configuration of Protons and Neutrons in an atomic nucleus, according to their specific Baryonic Energy levels, in turn revealing the quantum geometry of all periodic Elements
8 2
7 8
6 18
5 32
4 32
3 18
2 8
1 2
Quantum number

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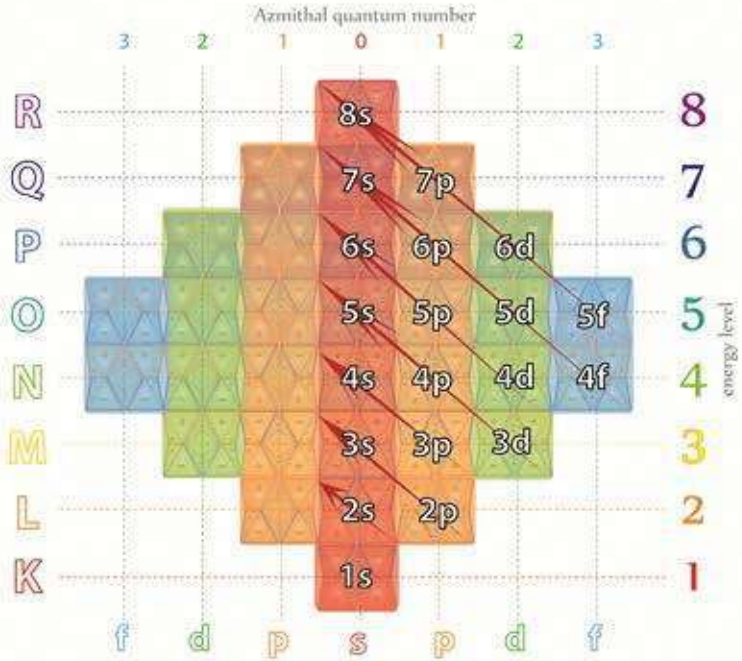
Wolfgang Pauli

(25 April 1900 – 15 December 1958)



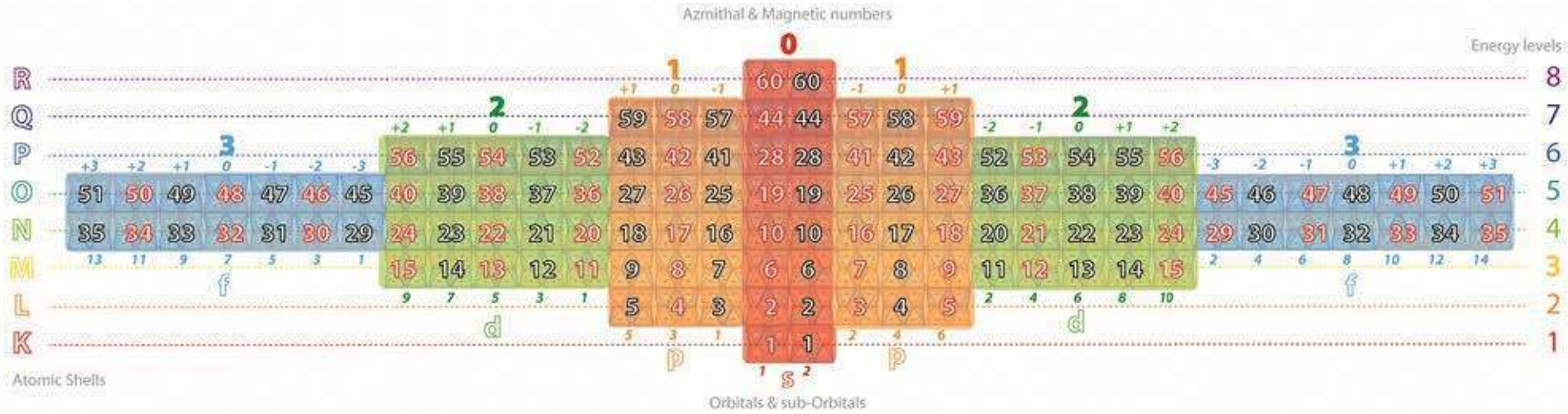
Friedrich Hermann Hund

(4 February 1896 - 31 March 1997)

The orbitals of lower energy are filled in first with the electrons and only then are the higher energy orbitals filled.

aufbau electron orbital filling

Orbitals of equal energy are each occupied by one electron before any orbital is occupied by a second electron, and all electrons in singly occupied orbitals must have the same spin state



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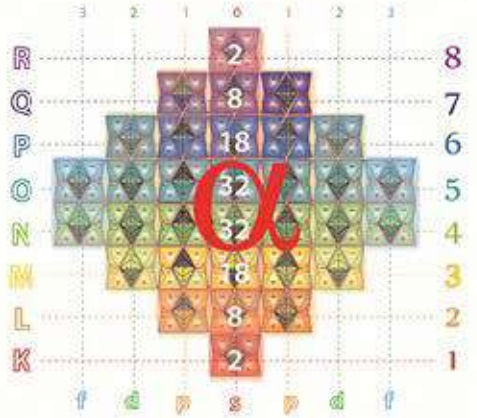
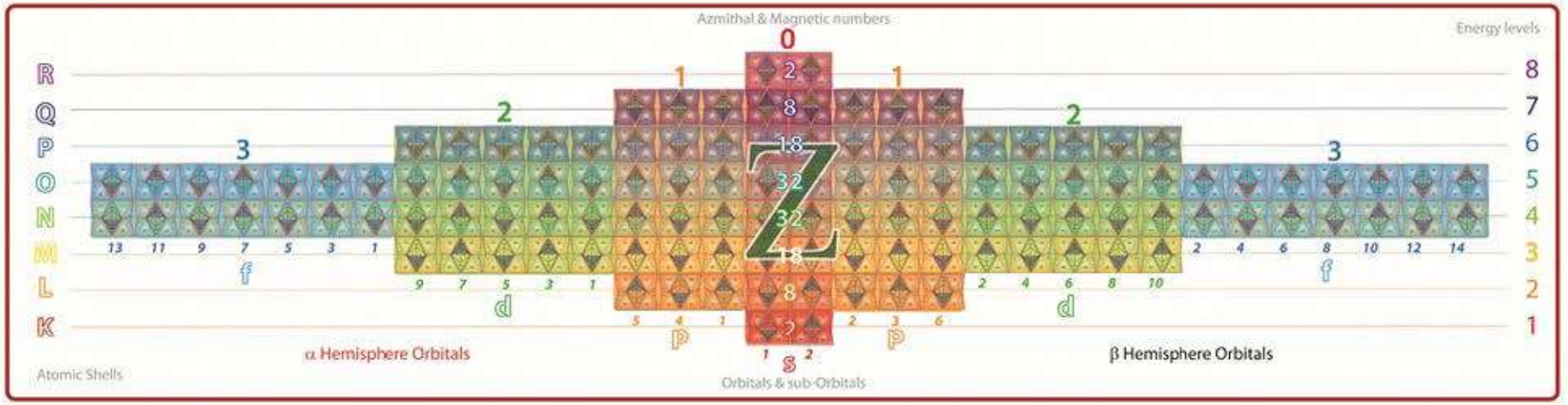
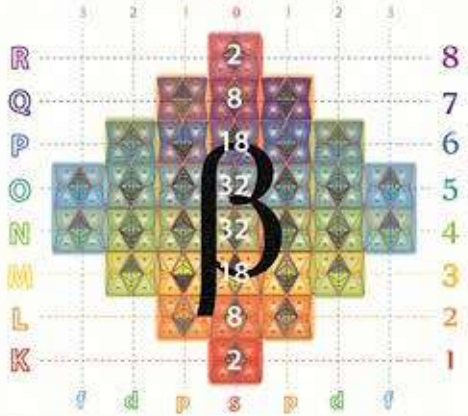
Aufbau construction

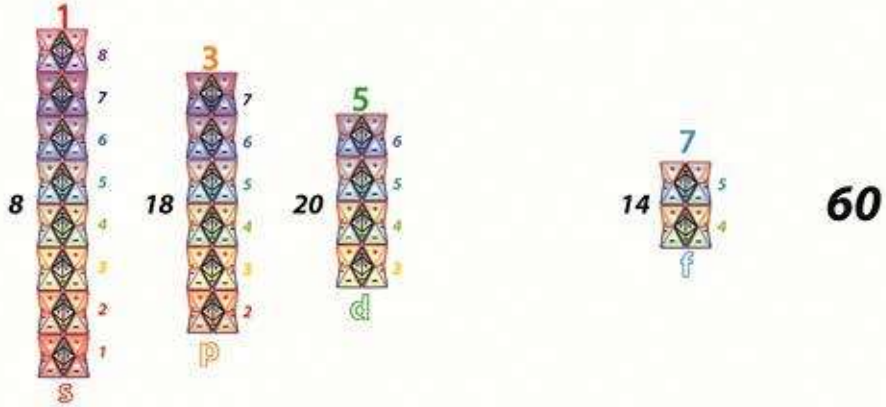
Proton base Hemisphere







Neutron base Hemisphere



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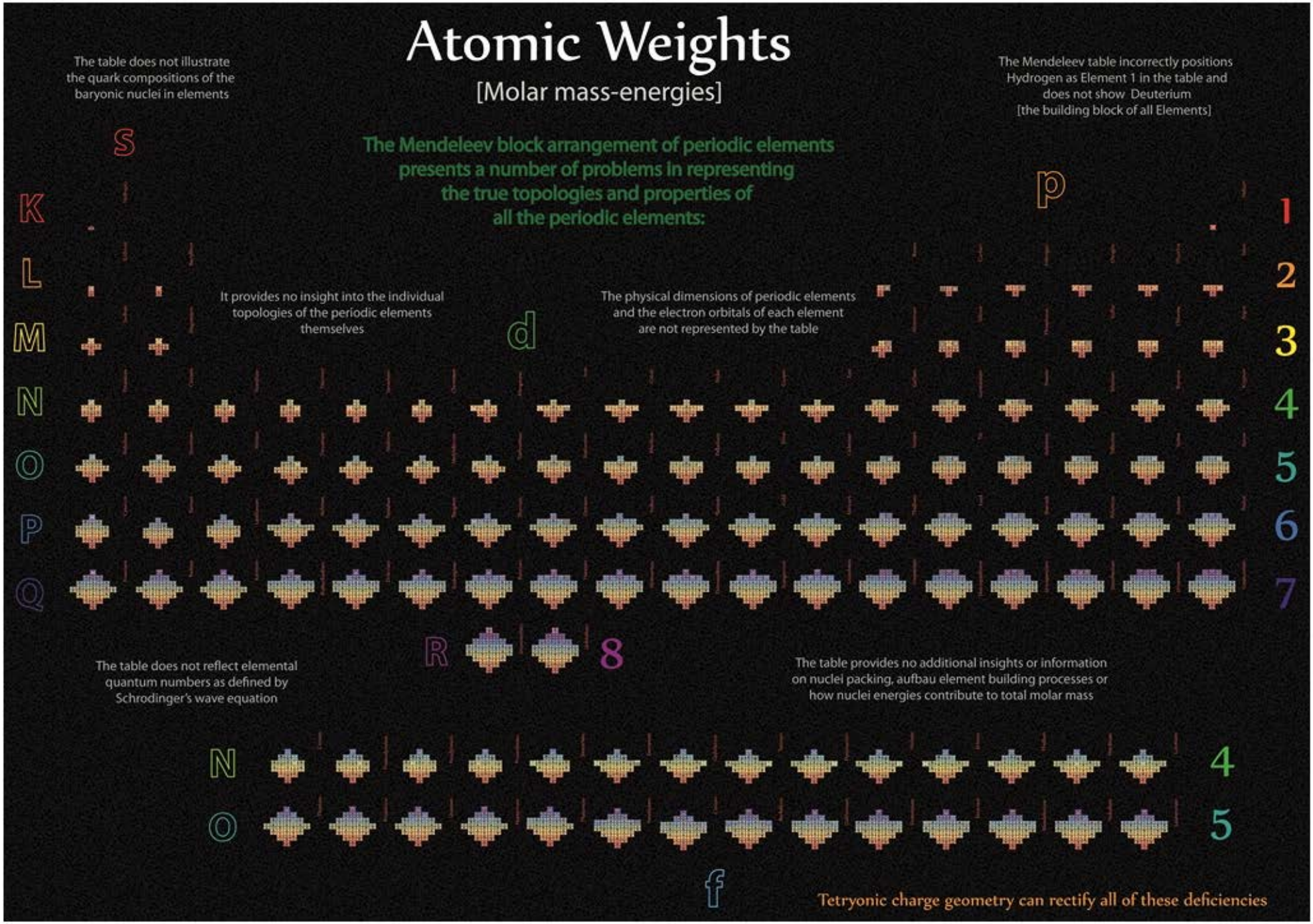
Atomic Weights
[Molar mass-energies]
The table does not illustrate the quark compositions of the baryonic nuclei in elements
The Mendeleev table incorrectly positions Hydrogen as Element 1 in the table and does not show Deuterium [the building block of all Elements]
The Mendeleev block arrangement of periodic elements presents a number of problems in representing the true topologies and properties of all the periodic elements:
It provides no insight into the individual topologies of the periodic elements themselves
The physical dimensions of periodic elements and the electron orbitals of each element are not represented by the table
The table does not reflect elemental quantum numbers as defined by Schrodinger's wave equation
The table provides no additional insights or information on nuclei packing, aufbau element building processes or how nuclei energies contribute to total molar mass
Tetryonic charge geometry can rectify all of these deficiencies

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Baryon mass-energies

n

E

The quantum level mass-energies of Baryons determines the kinetic energies of electrons

1n - 1 e19v

electron KEM field

hv^2

73,728	n32	v8	3.268969693 e15
69,192	n31	v7	2.502804921 e15
64,800	n30	v6	1.838795452 e15
60,552	n29	v5	1.276941286 e15
56,448	n28	v4	8.172424232 e14
52,488	n27	v3	4.596988631 e14
48,672	n26	v2	2.043106058 e14
45,000	n25	v1	5.107765145 e13

Compton frequencies

930 MeV

1.2 e20 electron rest Matter is velocity invariant

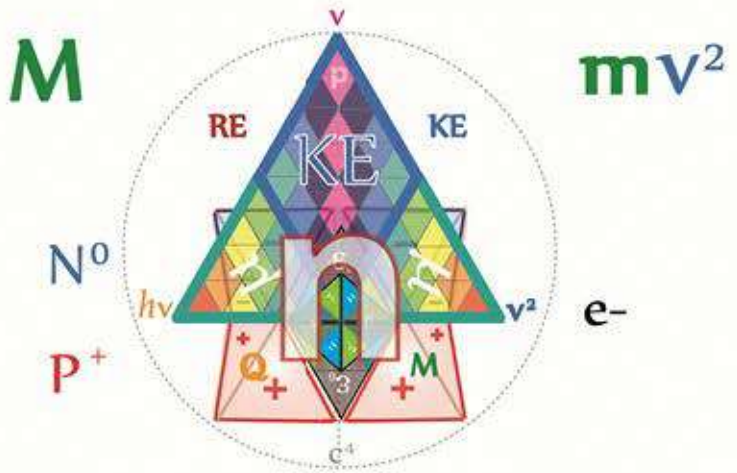
496 keV

spectral frequencies

13.6 eV

Atomic nuclei mass-energies

Each element's weight [mass-Matter in a gravitational field] is the result of the total quanta comprising that element



The nuclei forming each atomic shell have specific mass-energy quanta

$$\sum_{1}^{8} n \left[[72(n)^2] + [12e19] + [m_e v^2] \right]$$

Baryon rest masses — lepton rest mass — KEM

Deuterium mass-energy per shell

Despite having differing mass-energies each Deuterium nuclei has the same velocity invariant Matter geometry [84π]

spin orbital coupling in synchronous quantum convertors

Electrons act as quantum scale rotating armatures in atomic nuclei and can only have specific energies reflective of the electron orbital energy level of the Baryons in which they are found

They acheive these energy levels by absorbing or emitting photons to acheive the specific angular momentum required

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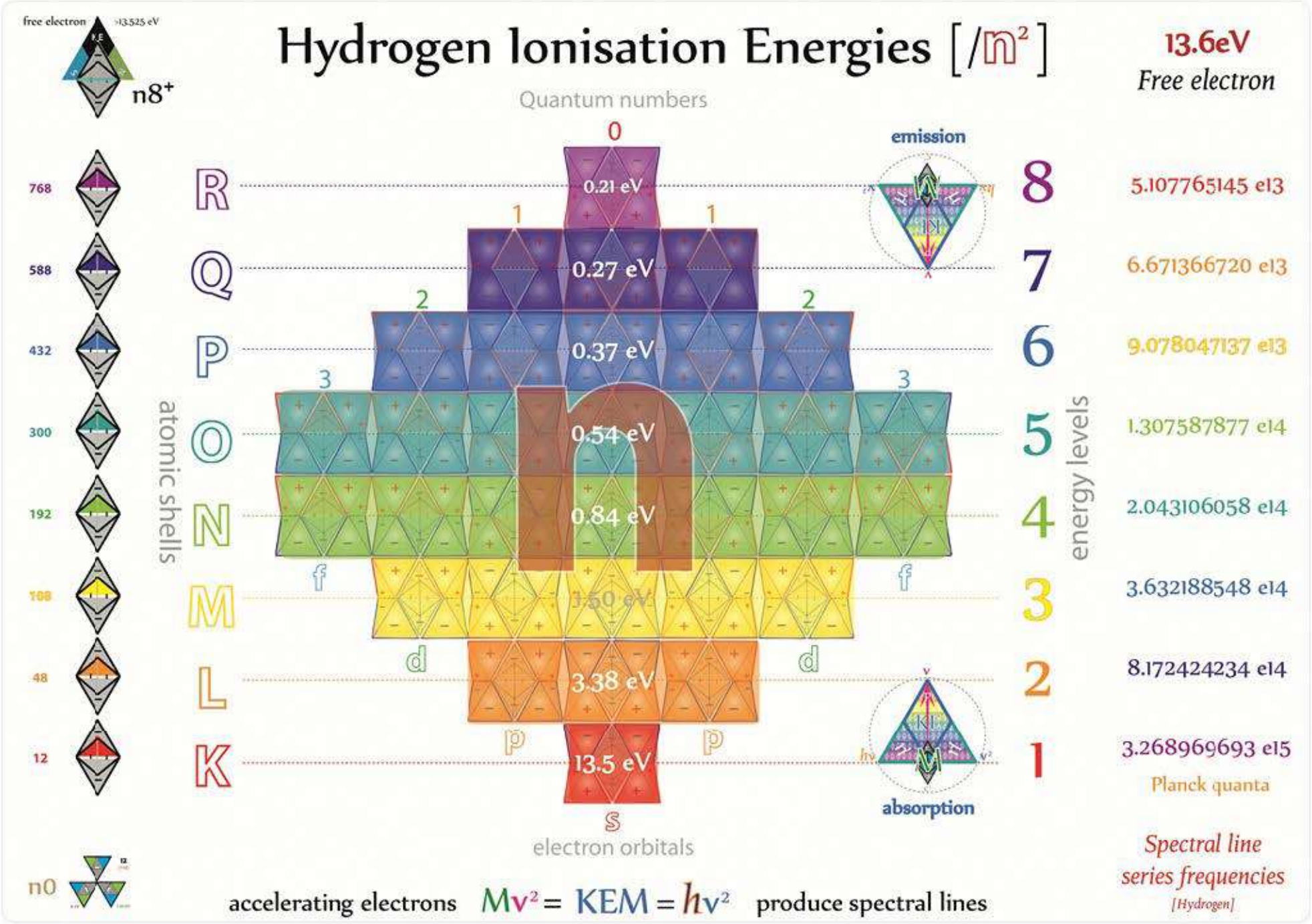

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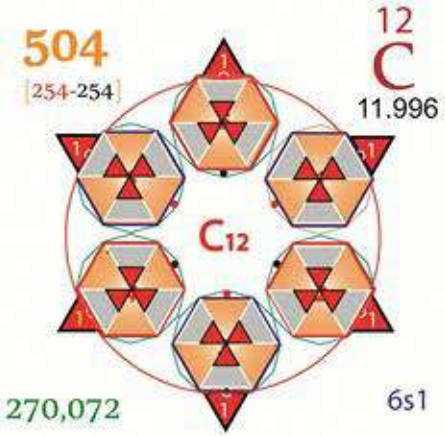
Redefining Atomic weights

Atomic weight (symbol: Ar) is a dimensionless physical quantity, the ratio of the average mass of atoms of an element (from a given source) to 1/12 of the mass of an atom of carbon-12 (known as the unified atomic mass unit)

Carbon 12



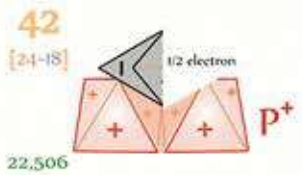
The 'unified atomic mass unit' currently in use is known to be inaccurate and must be corrected in order to bring clarity & increased accuracy to the atomic weights of all elements

$A_r = 22{,}512$ Hydrogen

Defining Hydrogen as having an exact atomic Planck mass of 22512n quanta provides uniformity with Tetryonics

1/12 C_{12}

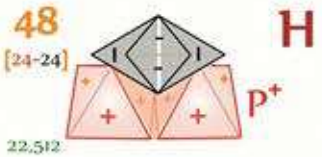
$A_r = 22{,}506$



1.660096209e-27 kg

1 Proton [24-12]
.5 electron 0-6
n1

Unified atomic Matter unit



1.660538783e-27 kg

1 Proton [24-12]
1 electron [0-12]
n1

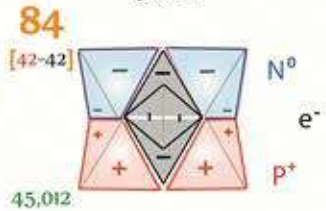
Deuterium is the building block of all elements in the period table

$A_r = 45{,}012$ Deuterium

Defining Deuterium as having an exact atomic Planck mass of 45012n quanta reflects the true charged geometries of all Elements & their topologies

D

1/6 C



3.320192418e-27 kg

1 Proton [24-12]
1 Neutron [18-18]
1 electron [0-12]
n1

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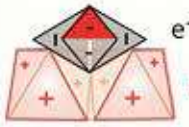
Planck mass-energy units

NAu = 0.001 kg

48
[24-24]



22,512

^{1}H

1.660538841 e-27 kg

One Da is approximately equal to the mass of one proton or one neutron

The unified atomic mass unit (symbol: u) or Dalton (symbol: Da) is a unit that is used for indicating mass on an atomic or molecular scale

270,072

1/12 the mass of a C12 graphene atom at rest in its electronic ground state

1.660538782(83)×10−27 kg

22,506

is an inaccurate means of determining the exact rest mass of a Hydrogen atom

22,512

Carbon 12 has 270,072n planck quanta (270,072 / 12 = 22,506)

Hydrogen has a mass of 22,512n (22,500+12) requiring all mass to be calculated directly using the Planck mass-energy quantum (.001kg / N_A / 22,512) & Tetryonic charge geometries

NA(12u) = 0.012 kg

504
[254-254]

12
C
11.996

270,072

6 [s1]

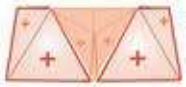
36
[18-18]

22,500

0.499866702 H

1.659653693 e-27 kg

36
[24-12]



22,500

0.499866702 H

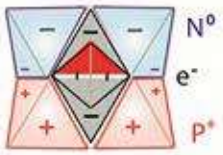
6 Protons [24-12]
6 Neutrons [18-18] n1
6 electrons [0-12]

Carbon has a number of differing atomic configurations (allotropes)

6 Protons [24-12]
6 Neutrons [18-18] n1-2
6 electrons [0-12]

Deuterium is the building block of all elements

84
[42-42]



45,012

^{2}H

3.320192534 e-27 kg

Using Tetryonic theory to define

n Planck mass = $7.376238634 \times 10^{-32}$ Kg

(see Tetryonics QM 15.04)

exact atomic rest masses for all particles, elements and compounds can be determined directly from atomic theory

N_A = 6.02214179 e23

The mole is the amount of substance of a system which contains as many elementary entities as there are atoms in 0.012 kilogram of carbon 12; its symbol is "mol".

504
[252-252]

6
C
12.6493

284,760

[He] 2s2 2p2

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Planck mass-energy contributions to the measured weights of periodic, elementary mass-Matter topologies

36
[18-18]
N^0
45,000n

1.659653693 e-27 kg

36
[24-12]
P^+
45,000n

Baryons have 2,25e23 Planck quanta comprising their rest Matter topologies

[930.974 MeV]

Δ 1875 x

[496.5 keV]

12
[0-12]
e-
12n

8.851486361 e-31 kg

Leptons have 1.2 e20 Planck quanta comprising their rest Matter topologies

[496.5 keV]

Δ 36,711 x

[13.6 eV]

2.41110961l e-35 kg

n
[v-v]
γ

0
KEM

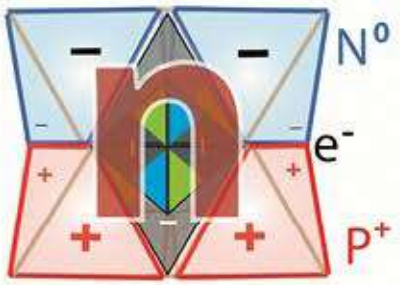
Photons are planar geometries [Matter-less] (purely Kinetic mass-Energy and momenta)

The Lyman alpha spectral line mass-energy contribution to the mass of a Deuterium nucleus is negligible

Electron quantum level energies are determined by the energy of the Nuclei they bind to in elements

D^+
[1.862 GeV]

84
[42-42]



90,012n+

Photons contribute spectral mass-energies to the nuclei mass but are themselves Matterless [2D zero rest mass-energies]

Photons are 2π charge mass-energy geometries

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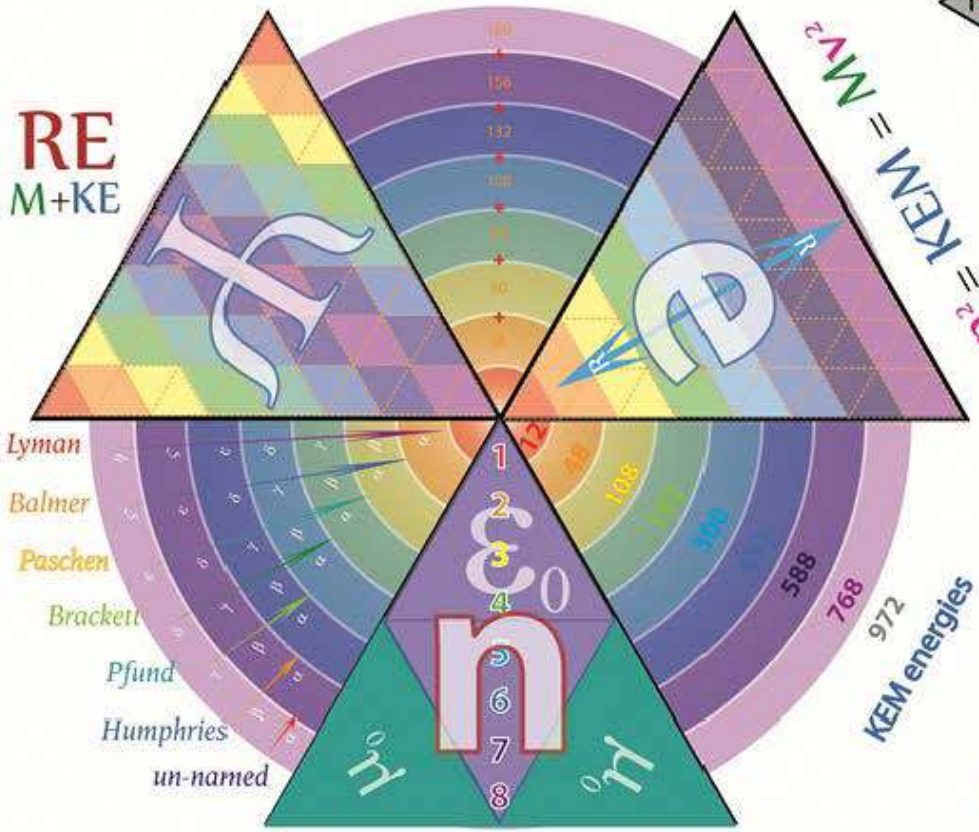
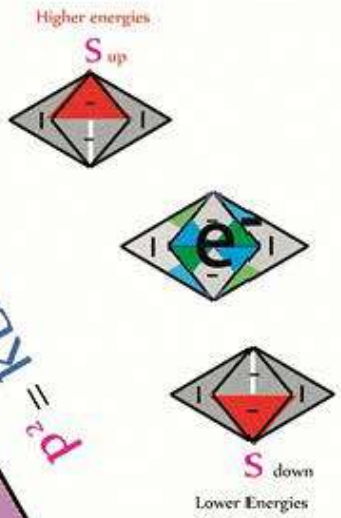
Ionisation energies

Fractional quantum differentials





$hf = \Delta Mv = \Delta p$

spectral lines are produced by accelerating electrons

Note: this is an Illustrative schema for modelling KEM field energies
All KEM fields possess the same physical spatial geometry
in radial-time defined spatial co-ordinate systems

c^2 c^4

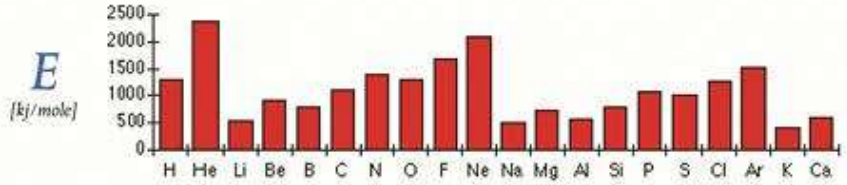
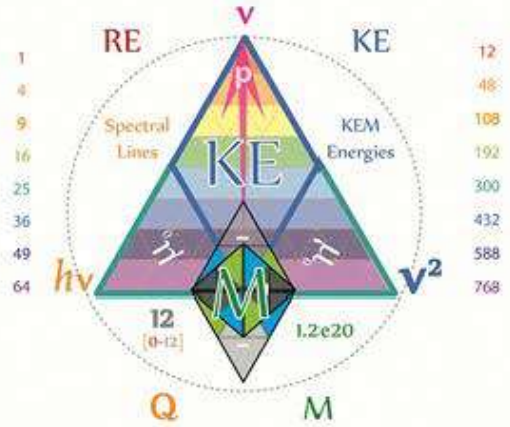


Photo-electrons absorb/emit spectral energies

$$E = eV = \frac{1}{4\pi\epsilon_0}\frac{ne^2}{a}$$

photo-electronic energy momenta



Mapping photo-electron transition energies to Tetryonic energy momenta geometries reveals many key facts about the ionisation energies of nuclei

$$E = -\frac{Z^2}{n^2}\frac{ke^2}{2a_0} = -\frac{13.6Z^2}{n^2}eV$$

The differing fractional KEM field energy momenta of electrons that results from their transitions to specific energy nuclei in elements results in differing QAM quanta and produces spectral lines and fine line splitting

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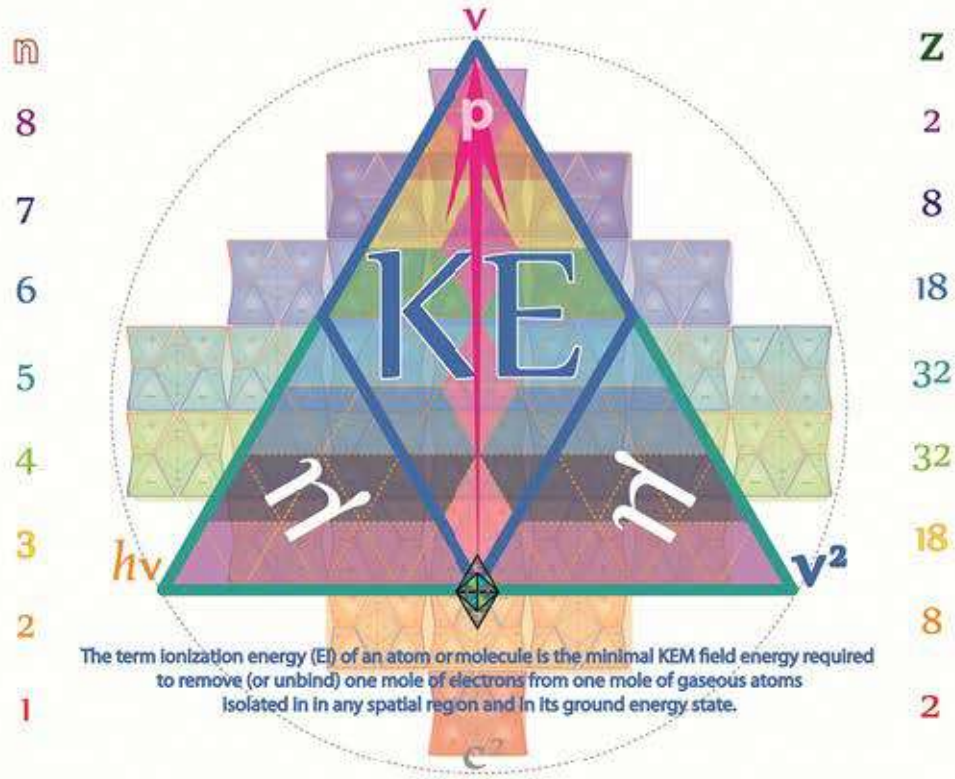
Elementary ionisation energies



The term ionization energy (EI) of an atom or molecule is the minimal KEM field energy required to remove (or unbind) one mole of electrons from one mole of gaseous atoms isolated in in any spatial region and in its ground energy state.

The term "ionization energy" is sometimes used as a name for the work needed to remove (or un-bind) the highest energy photoelectron from an atom or molecule.

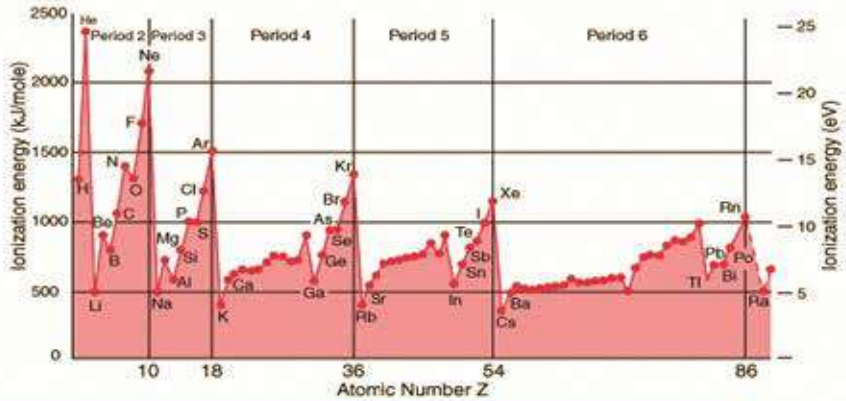
However, due to interactions with surfaces, this value differs from the ionization energy of the atom or molecule in question when it is located by itself in free space.

So, in the case of surface-adsorbed atoms and molecules, it may be better to use the more general term "electron binding energy", in order to avoid confusion.

Both these names are also sometimes used to describe the work needed to remove an electron from a "lower" orbital (i.e., not the topmost orbital) for both free and adsorbed atoms; in such cases it is necessary to specify the orbital from which the electron has been removed

$$E = -\frac{Z^2}{n^2}\frac{ke^2}{2a_0} = -\frac{13.6Z^2}{n^2}eV$$

Every electron in each elementary orbit has a unique ionisation energy



Nuclei	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	per shell

Element number

R	119	120																															
Q	87	88	113	114	115	116	117	118																									
P	55	56	81	82	83	84	85	86	103	104	105	106	107	108	109	110	111	112															
O	37	38	49	50	51	52	53	54	71	72	73	74	75	76	77	78	79	80	89	90	91	92	93	94	95	96	97	98	99	100	101	102	
N	19	20	31	32	33	34	35	36	39	40	41	42	43	44	45	46	47	48	57	58	59	60	61	62	63	64	65	66	67	68	69	70	
M	11	12	13	14	15	16	17	18	21	22	23	24	25	26	27	28	29	30															
L	3	4	5	6	7	8	9	10																									
K	1	2																															
Shells																																	
	s1	s2	p1	p2	p3	p4	p5	p6	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12	f13	f14	

Orbitals

sub-orbitals

8	2
7	8
6	18
5	32
4	32
3	18
2	8
1	2

Energy level

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Hyperfine splitting and Lamb Shifts

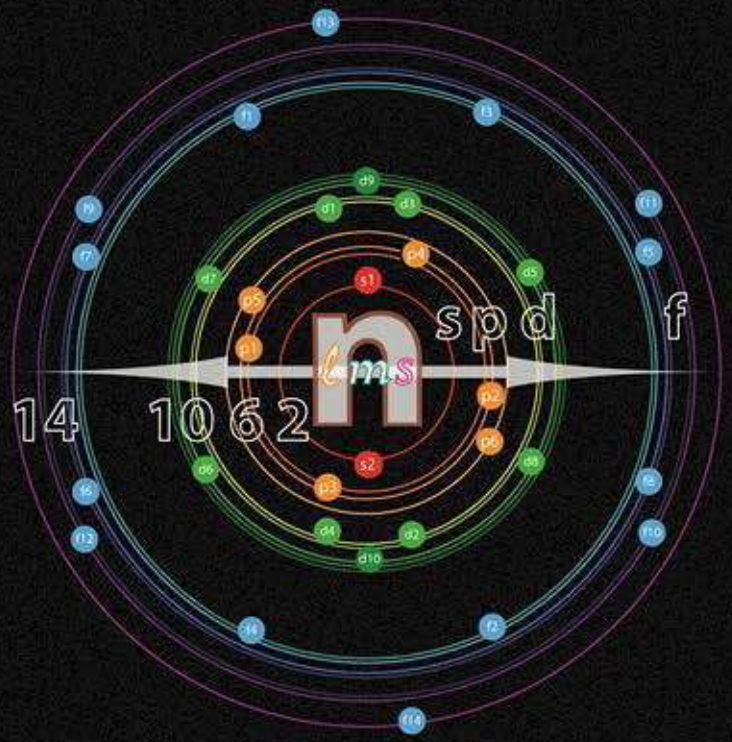
When the spectral lines of the hydrogen spectrum are examined at very high resolution, they are found to be closely-spaced doublets.
This splitting is called fine structure and was one of the first experimental evidences for electron spin.

The fine structure describes the splitting of the spectral lines of atoms due to first order relativistic corrections (principal quantum energies)

n

Differing electron spins within shells & quantum levels produces Hyperfine splitting

atomic shell energies result from Series addition of baryonic energies



If you measure the atomic energy levels of photo-electrons at an extremely high resolution, you'll find small deviations of individual KEM field energies of electrons in sub-orbitals which are primarily the result of parallel and anti-parallel electron spins

Higher energy
Parallel
Magnetic moments

Lower energy
Anti-parallel
Magnetic moments

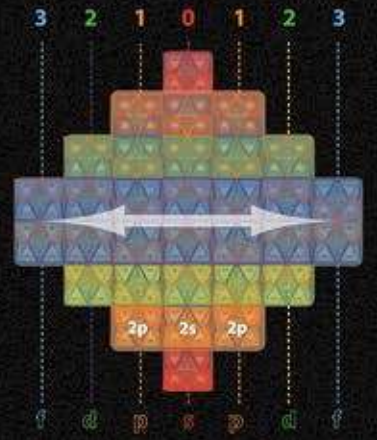
All electron spins are referenced to the Nuclear magneton

The electron energy levels of Hydrogen should depend only on the principal quantum number n.

In 1951 it was discovered that this was not so, the $2p_{(1/2)}$ state is slightly less than the $2s_{(1/2)}$ state resulting in the Lamb shift

l m s

Differing electron sub-Orbtial energies create Lamb Shifts



electron sub-orbital energies are Parallel energy configurations

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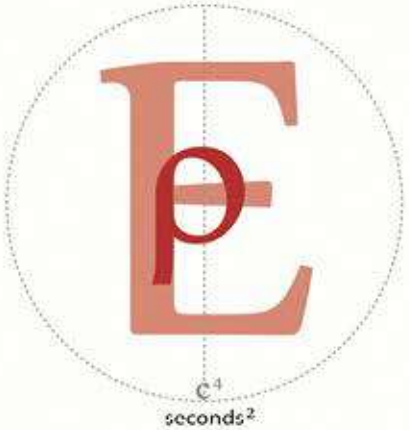
M_0

3D Matter topologies are comprised of charged 2D mass-energies

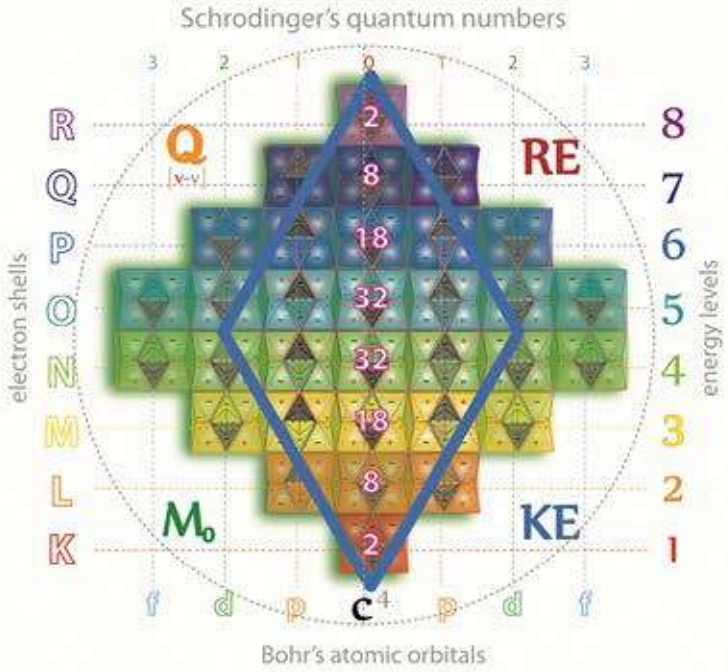
Energy per second²



RE

Relativistic mass-ENERGY-Matter

Relativity fails at the foundational level to explain and differentiate between mass-ENERGY and Matter in physical systems



Einstein's relativistic [Lorentz corrected] stress energy tensor aggregates all forms of energy into a single energy density gradient

$$\frac{T\pi}{c^4}\left[\left[m\Omega v^2\right]\right]$$

Matter · Planck quanta · mass · velocity

atomic energies

$$\frac{Tmn}{c^4} + \frac{mv^2}{c^2}$$

electron spins

$$\frac{n\pi}{c^2}\left[\left[m\Omega v^2\right]\right]$$

mass · Planck quanta · mass · velocity

mass-Matter

standing wave mass-energiescreate
the material substance of all chemical elements

3D rest Matter + Lorentz corrected 2D Kinetic Energies
= total Relativistic Energies

KE

2D equilateral mass-energies are euclidean geometries

Energy per second

mass-energies

radiant planar mass-energies create
EM fields, spectral lines & chemical interactions

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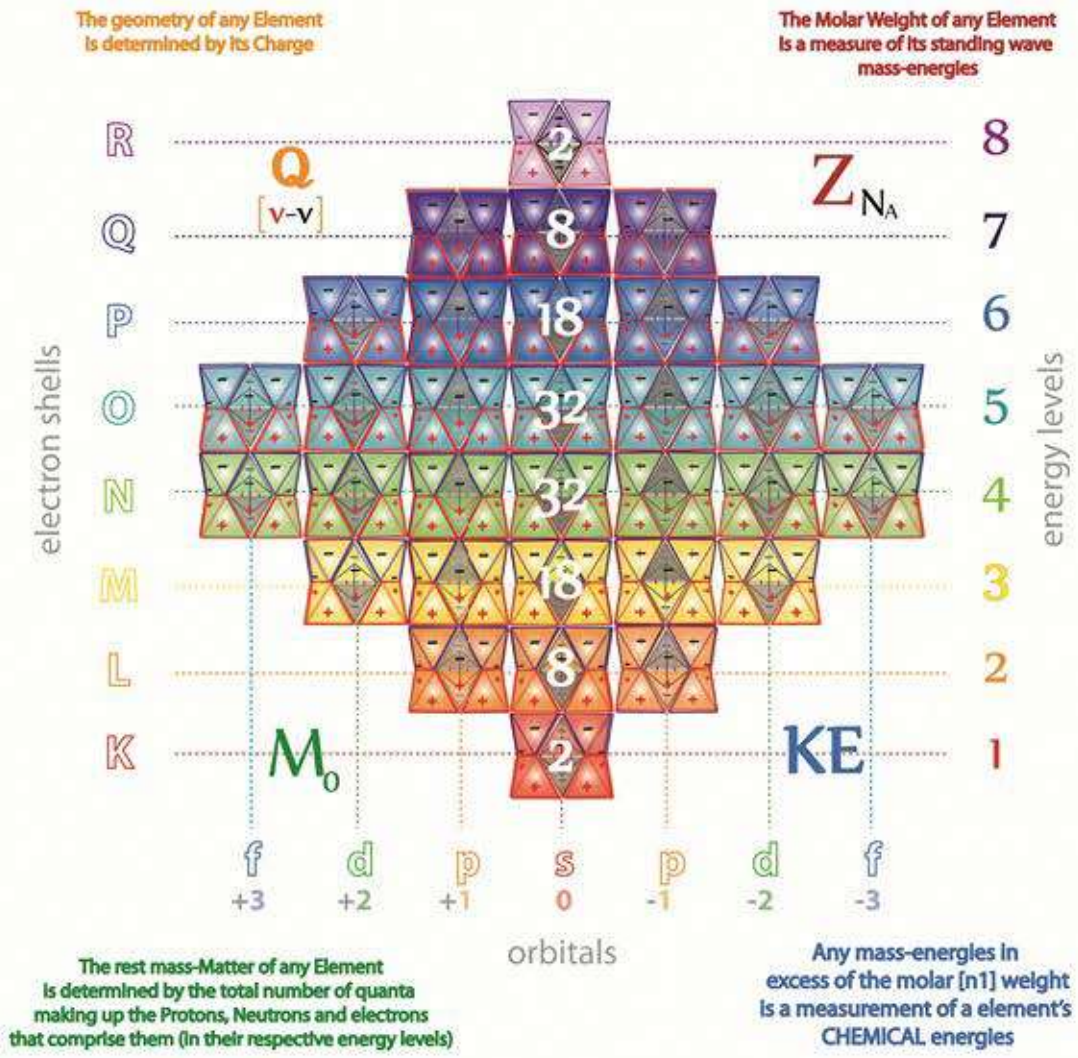
Deuterium is the building block of all Elements (save Hydrogen)



Important point to note:
The Kinetic Energy difference between any Element's total [n1] Deuteron mass-energies and its Molar mass has historically been incorrectly explained as resulting from an excess number of Neutrons in the atom it is not, Z# = (number of Protons = number of electrons = number of Neutrons)

Elementary mass-Matter

$$\sum_{K}^{R}$$

n per nuclei 1e19v = n		
2	2 nuclei [74,496 ea]	120 Unbinilium 119 Ununennium
+		
8	8 nuclei [69,780 ea]	118 Ununoctium 87 Francium
+		
18	18 nuclei [65,232 ea]	112 Copernicium 55 Caesium
+		
32	32 nuclei [60,852 ea]	102 Nobelium 37 Rubidium
+		
32	32 nuclei [56,640 ea]	70 Ytterbuim 19 Potassium
+		
18	18 nuclei [52,596 ea]	30 Zinc 11 Sodium
+		
8	8 nuclei [48,720 ea]	10 Neon 3 Lithium
+		
2	2 nuclei [45,012 ea]	2 Helium 1 Deuterium

The rest mass-Matter of any Element is the sum total of its constituent Z[n²] energy level Deuterium nuclei

Aufbau

$$Z\# \begin{bmatrix} z\ \text{Protons} & [24\text{-}12] \\ z\ \text{Neutrons} & [18\text{-}18] \\ z\ \text{electrons} & [0\text{-}12] \end{bmatrix} n1\text{-}8$$

(ie Calcium [20] = 2+8+10 n level Deuterium nuclei)

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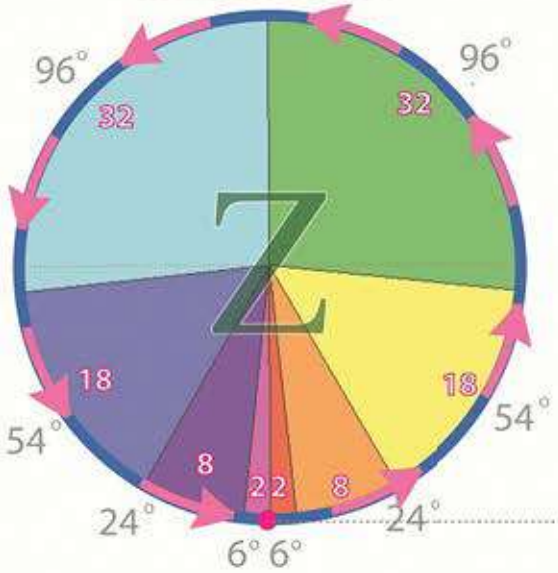
Periodic Harmonic motions

$x = A \cos(\omega t + \varphi)$

Much of the math in of modern physics is predicated on the assumption that π [where it appears] is related to the properties of a circle

$F = -kx$

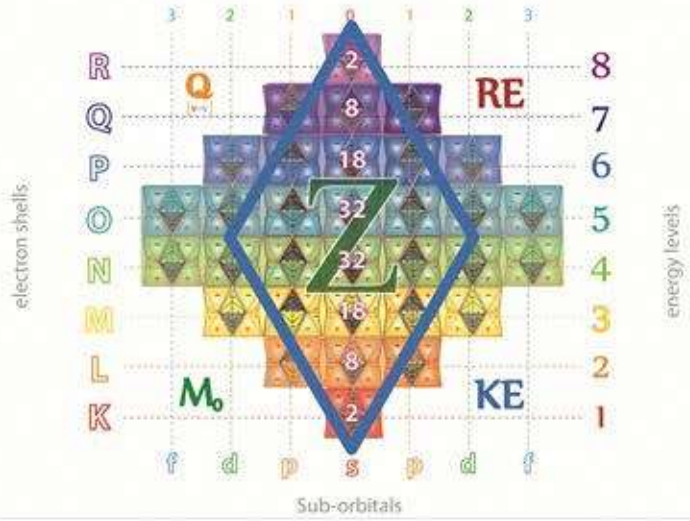
Circular motion



Linear motion

Simple harmonic motion can be visualized as the projection of uniform circular motion onto one axis

Principal Quantum Numbers



circular harmonic motion

Circular motions describe the motion of a body with a changing velocity vector [the result of an acceleration force].

simple harmonic motion

Nuclei per shell in elements follows a 'periodic summation rule' that is reflective of photonic energies

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$$\sum_{K}^{R}$$

nuclei per shell

$$\sum_{K}^{R} \quad {}^{P}\sum Z \quad \sum_{1}^{120} Z$$

element number

Periodic Summation

Periodic summation is a notation developed for Tetryonic theory to model the geometric series addtion of Z[n²] energy level Deuterium nuclei that form the periodic elements

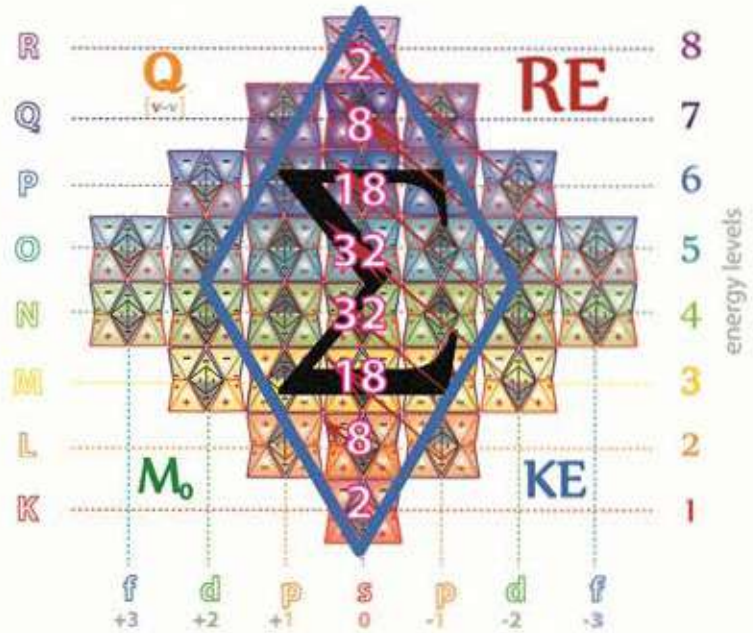
STEP ONE

Periodic summation follows the atomic shell electron config

STEP TWO

Periodic elements build up following the aufbau sequence

$$\begin{matrix}1\\2\\3\\4\\4\\3\\2\\1\end{matrix}\ {}^{R}_{K}\sum {}^{P}\sum 2(x^2) = \begin{matrix}2\\8\\18\\32\\32\\18\\8\\2\end{matrix}\ \begin{matrix}R\\Q\\P\\O\\N\\M\\L\\K\end{matrix}$$



${}^{P}\sum R = 2$	2 nuclei [74.496 ea]	120	Unbinilium
+			
${}^{P}\sum Q = 8$	8 nuclei [69,780 ea]	118	Ununoctium
+			
${}^{P}\sum P = 18$	18 nuclei [65,232 ea]	110	Darmstadtium
+			
${}^{P}\sum O = 32$	32 nuclei [60,852 ea]	92	Uranium
+			
${}^{P}\sum N = 32$	32 nuclei [56,640 ea]	60	Neodymuim
+			
${}^{P}\sum M = 18$	18 nuclei [52,596 ea]	28	Argon
+			
${}^{P}\sum L = 8$	8 nuclei [48,720 ea]	10	Neon
+			
${}^{P}\sum K = 2$	2 nuclei [45,012 ea]	2	Helium
		0	Hydrogen

Each atomic shell can hold only a fixed number of deuterium nuclei

THe LHS of the notation determine the number of nuclei in each atomic shell, from the periodic mass-energy levels for atoms, and the RHS follows the aufbau building principle to determine the rest mass-Matter of any specific element

Aufbau

Each periodic element is made of Z [n² energy] deuterium nuclei

$$Z\# \begin{bmatrix} z\ \text{Protons} & [24\text{-}12] \\ z\ \text{Neutrons} & [18\text{-}18] \\ z\ \text{electrons} & [0\text{-}12] \end{bmatrix} n1\text{-}8$$

Planck mass-energies form the surface integral of rest Matter topologies for each periodic element

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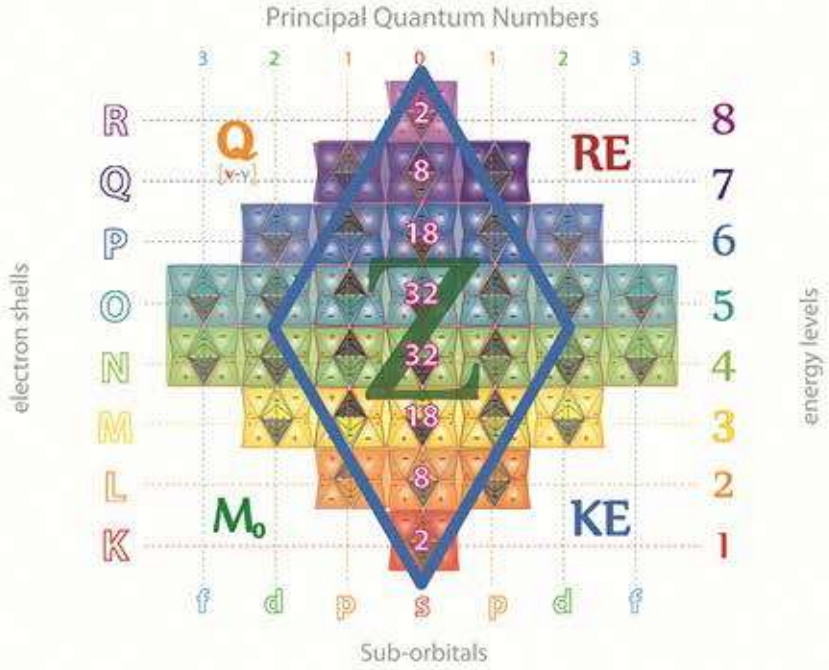
Element numbers

Nuclei per shell in elements follow a 'periodic summation rule' that is reflective of photonic energies

$$\sum_{K}^{R} 2(x^2) = 2 + 8 + 18 + 32 + 32 + 18 + 8 + 2$$

$$Z$$

120	Unbinilium	n8
119	Ununennium	
118	Ununoctium	n7
87	Francium	
112	Copernicium	n6
55	Caesium	
102	Nobelium	n5
37	Rubidium	
70	Ytterbuim	n4
19	Potassium	
30	Zinc	n3
11	Sodium	
10	Neon	n2
3	Lithium	
2	Helium	n1
1	Deuterium	
Hydrogen	0	



Periodic mass-ENERGY-Matter

Following periodic summation rules for shell filling n[1-8] quantum energy deuterium nuclei combine to form elementary Matter

$$\sum_{K}^{R} {}_{25}^{32}\Big[\,[72(n)^2]+[12e19]+[m_e v^2]\,\Big]_{1}^{8}$$

Baryon rest masses · lepton rest mass · KEM

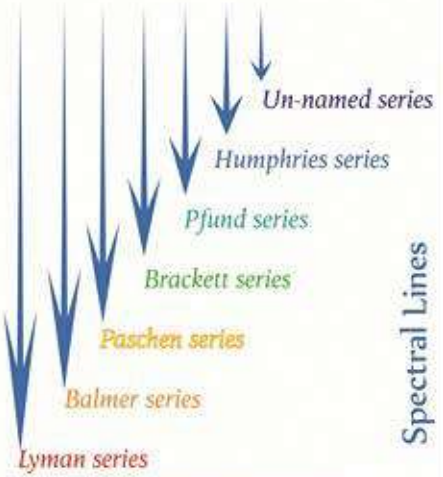
Deuterium mass-energy per shell

The measured weight of Matter in gravitational fields is the result of planar mass-energies in tetryonic standing-wave geometries

The periodicity of all the elements, along with their exact molar rest mass-energies and quantum wavefunctions can be described with Tetryonic geometries

Ionisation energies

$$\gamma$$



$$Mv^2 = KEM = hcR_H$$

Photon emission/absorption

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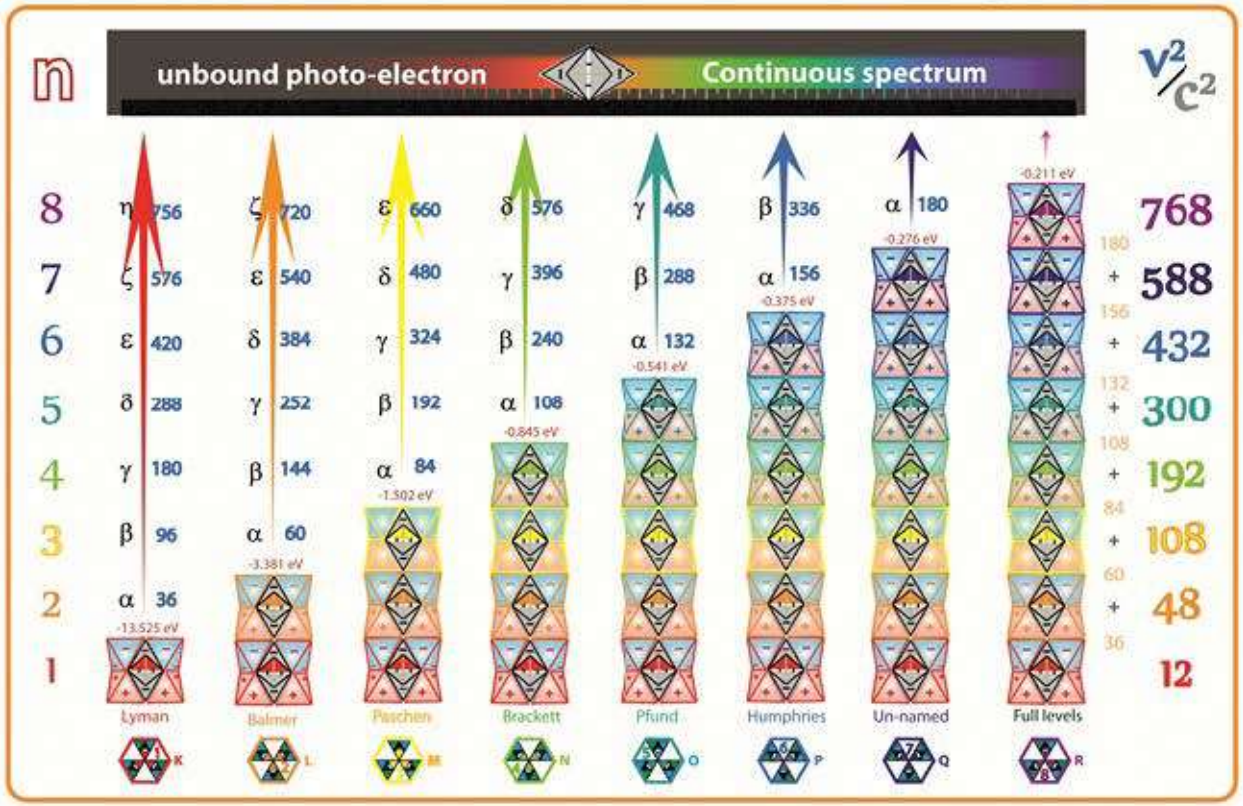
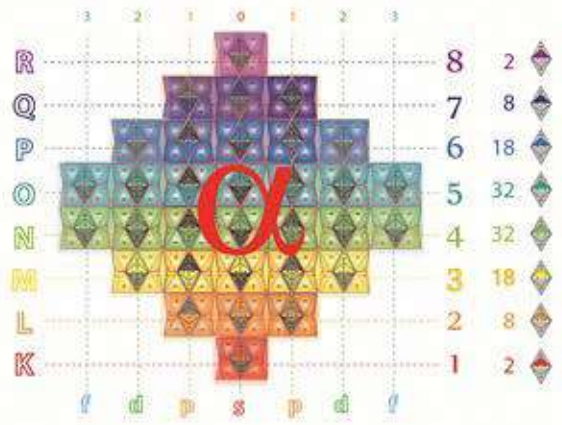
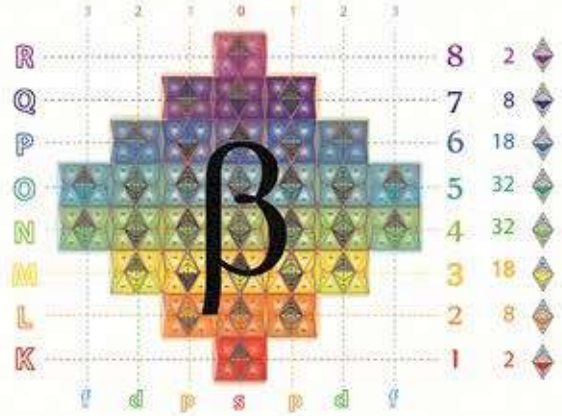
Photo-electron ionisation energies

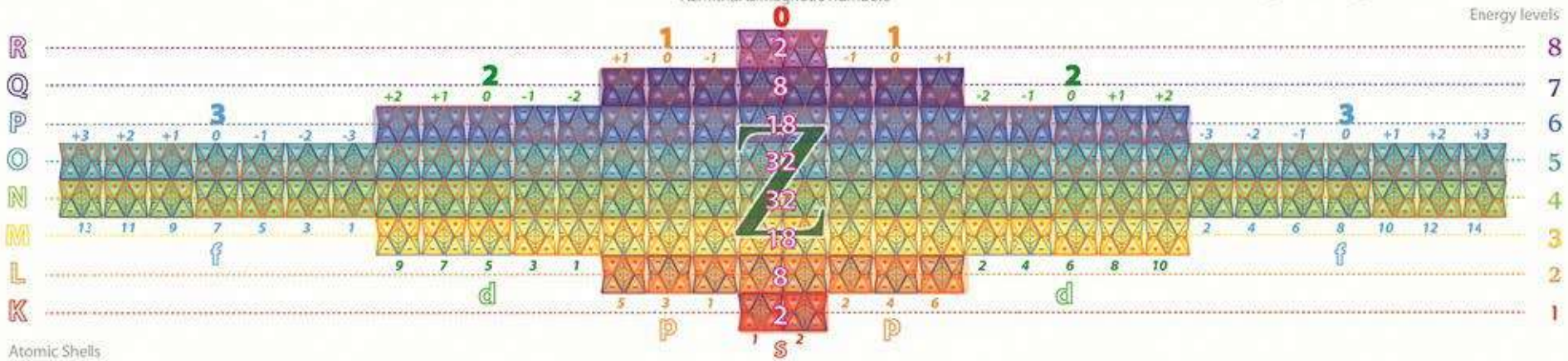




Opposed electron spins results in Hyperfine splitting & Lamb shifts



Energy levels



Azmithal & Magnetic numbers

Atomic Shells

Orbitals & sub-Orbitals

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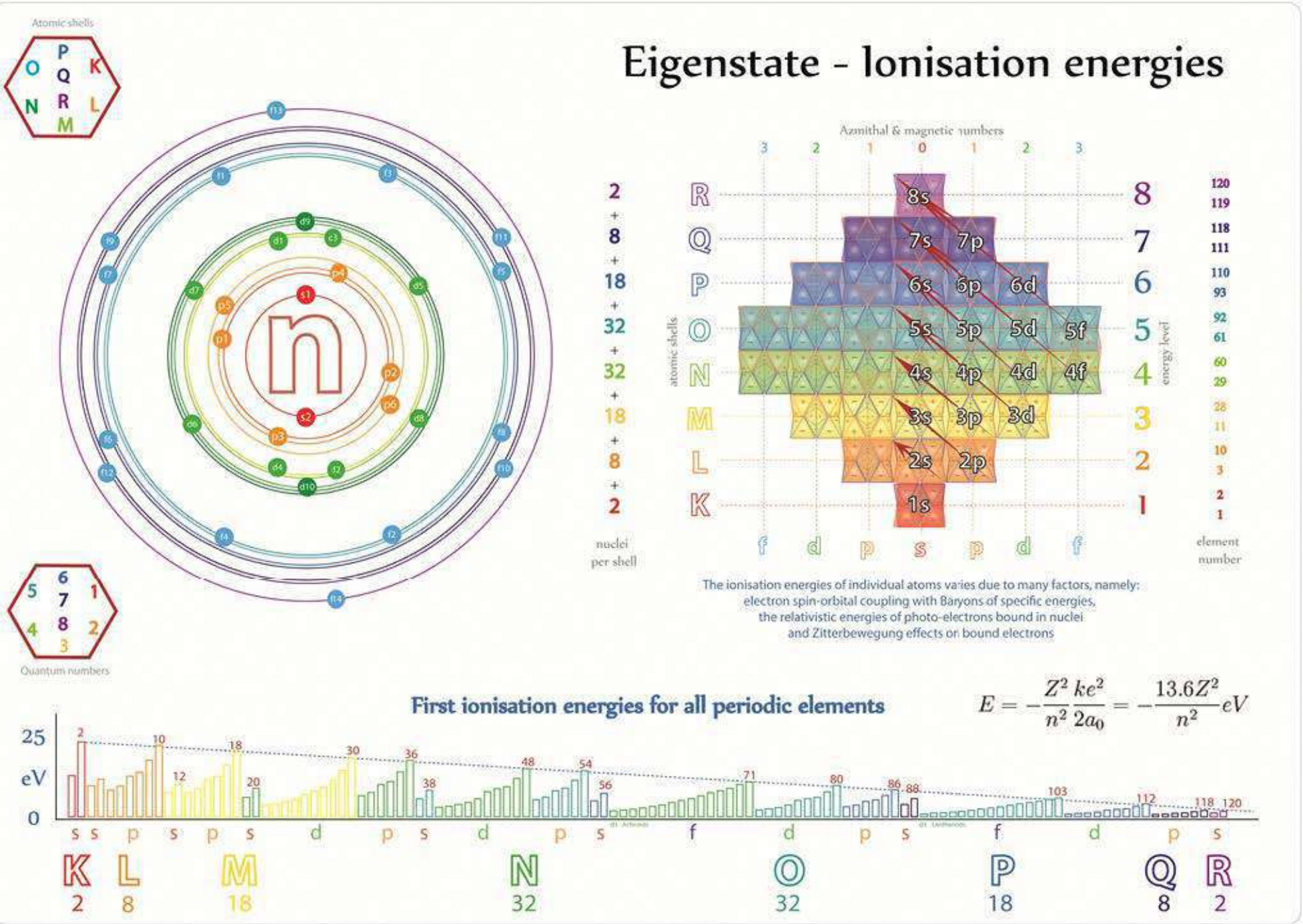

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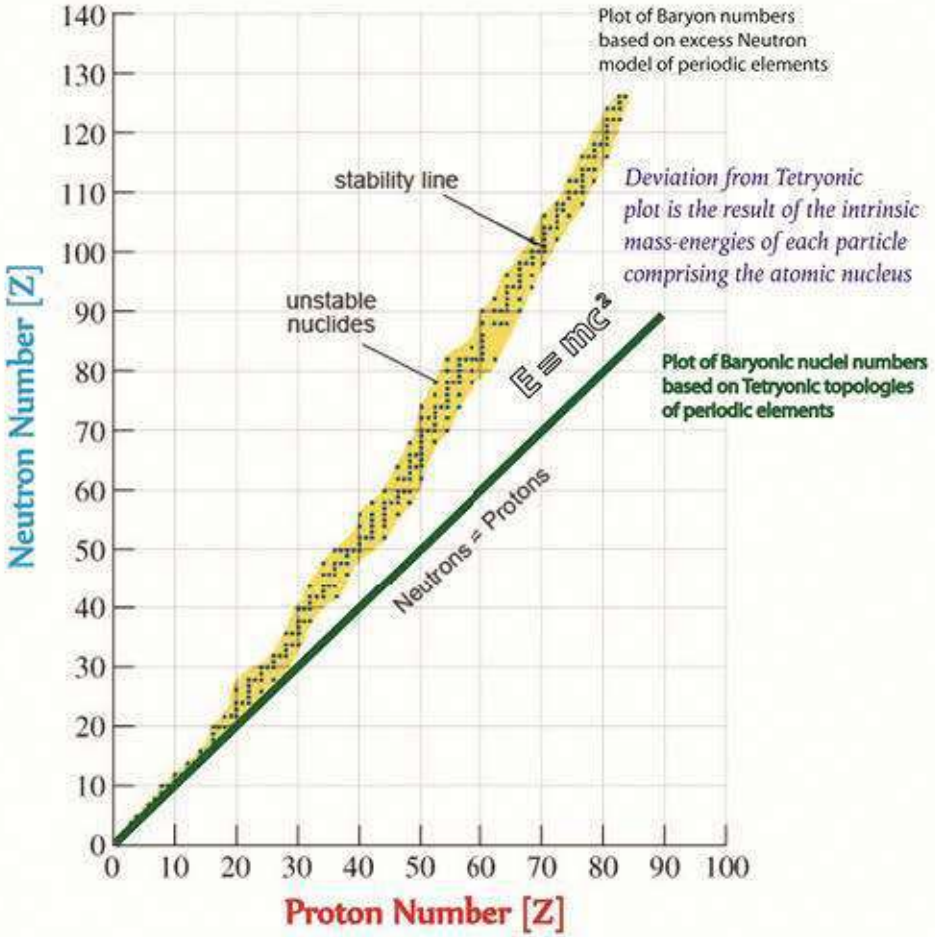
Proton - Neutron Curve

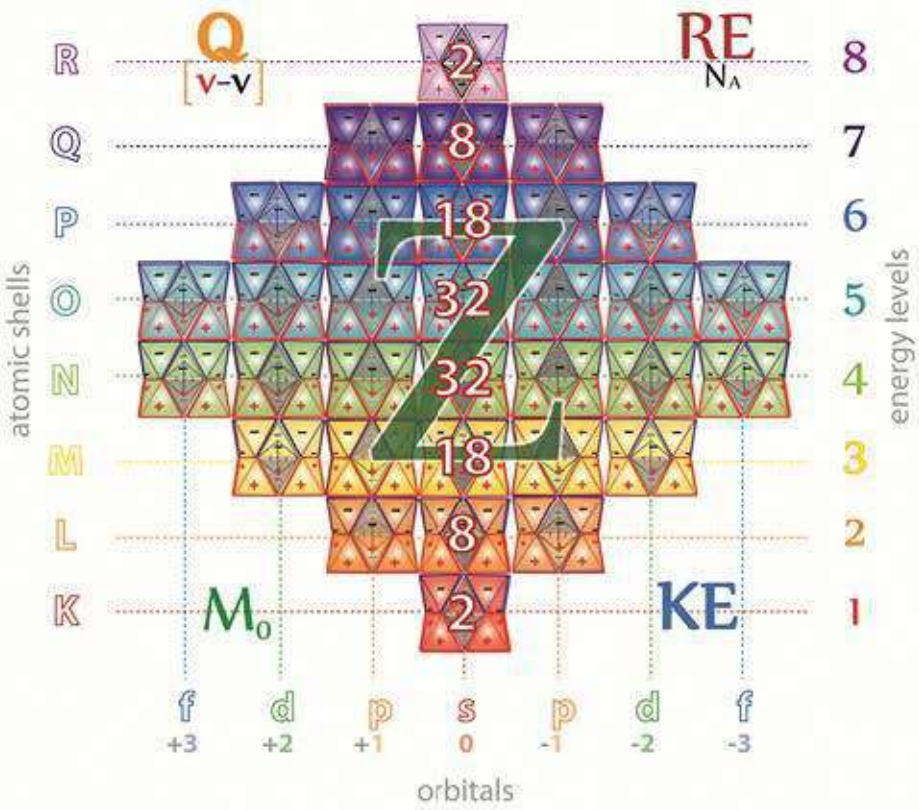
The graph below is a plot of neutron number against proton number.
It is used as rule to determine which nuclei are stable or unstable.


Plot of Baryon numbers based on excess Neutron model of periodic elements
stability line
unstable nuclides
Deviation from Tetryonic plot is the result of the intrinsic mass-energies of each particle comprising the atomic nucleus
E=mc²
Plot of Baryonic nuclei numbers based on Tetryonic topologies of periodic elements
Neutrons = Protons
Neutron Number [Z]
Proton Number [Z]
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Historically, Proton-electron numbers are viewed as being equivalent in neutral elementary matter with the excess molar mass measured being the result of 'excess or extra' Neutrons in the atom

Atomic Nuclei Numbers

All periodic elements have an EQUAL number of Protons, Neutrons & Electrons with their molar mass-Matter being determined by their quantum level mass-energies



Tetryonic modelling of the charged mass-ENERGY-Matter topologies of elementary atoms and the nuclei that comprise them, reveals a DIRECT LINEAR relationship for the number of Protons-electrons-Neutrons in all periodic elements and nuclear isotopes

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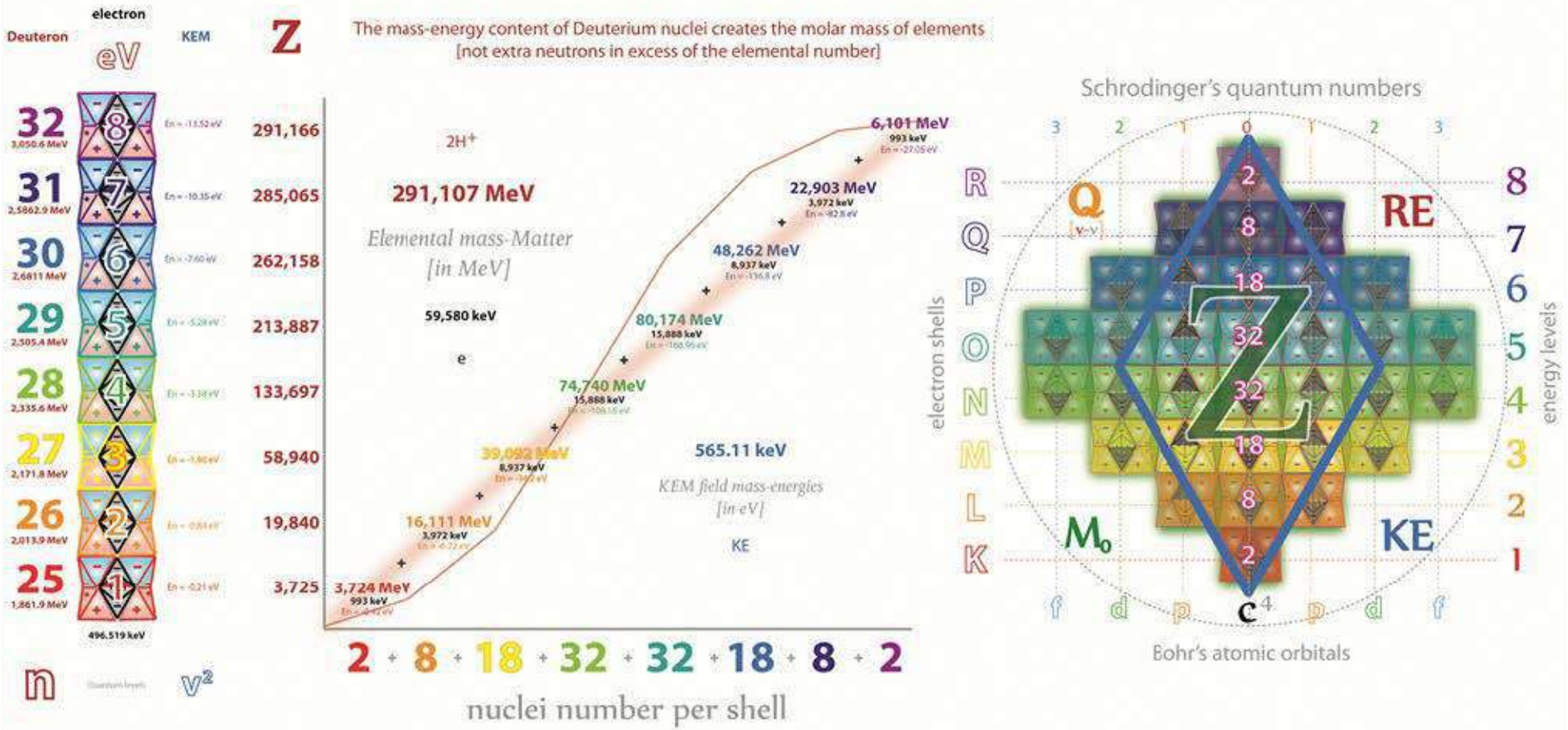
Planck mass-energy contributions to elementary Matter and isotopes



n1 Elementary nuclei

are comprised of equal numbers of Protons, Neutrons & electrons with varying energy levels

Baryons		electrons		KEM fields
930.947 MeV	+	496.519 keV	+	13.525 ev

The mass-energy content of Matter topologies is velocity invariant

The mass-energy content of Baryons determines the KEM field of electrons

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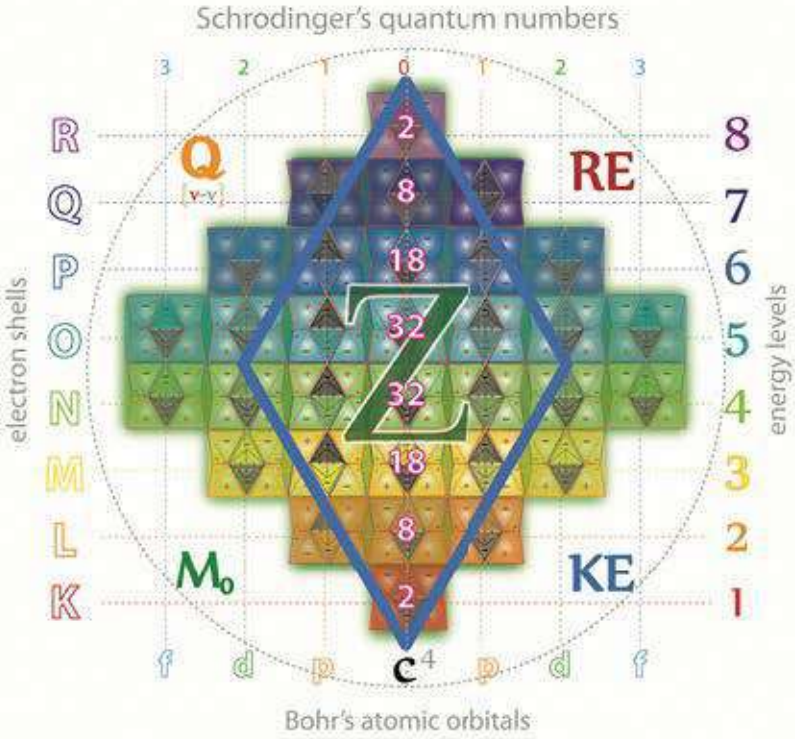
Baryons **930.947 MeV** + KEM fields **13.525 ev** + electrons **496.519 keV**

Mapping Planck mass-energy contributions to elementary Matter and isotopes



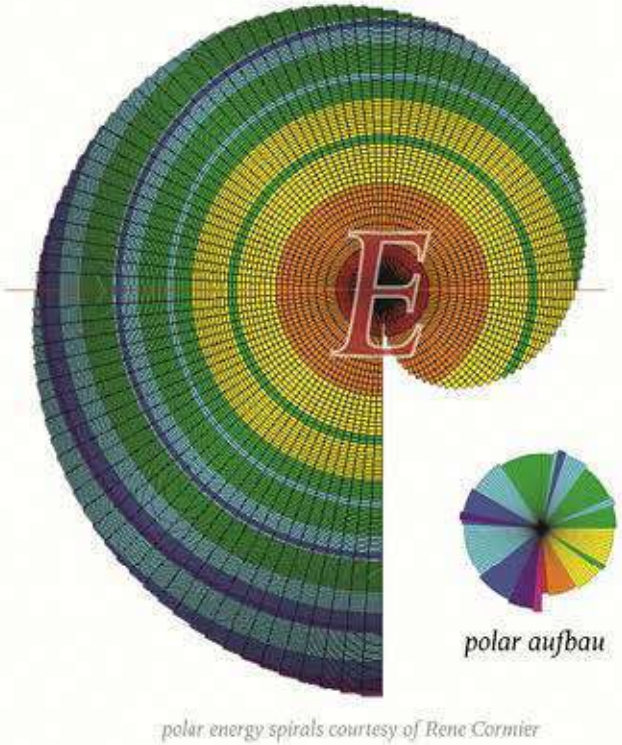
$$E = hv^2$$

$$n^2 + v^2 + e = Z$$

general form quatratic equation

$$ax^2 + bx + c = Z$$

$$E = nhv$$



polar energy spirals courtesy of Rene Cormier

Identifying electron rest Matter topologies as velocity invariant we can re-arrange the component Planck mass-energy geometry formulation of periodic elements to

$$h\left[72[v^2]_{\text{Deuteron rest mass}} + v_{\text{Spectral lines}} + 1.20\,e20\,v_{\text{electron rest mass}}\right]$$

reveal a quadratic formulation for all Z numbers

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All elements are comprised of n level Duetrium nuclei

Baryons **KEM fields** **electrons**

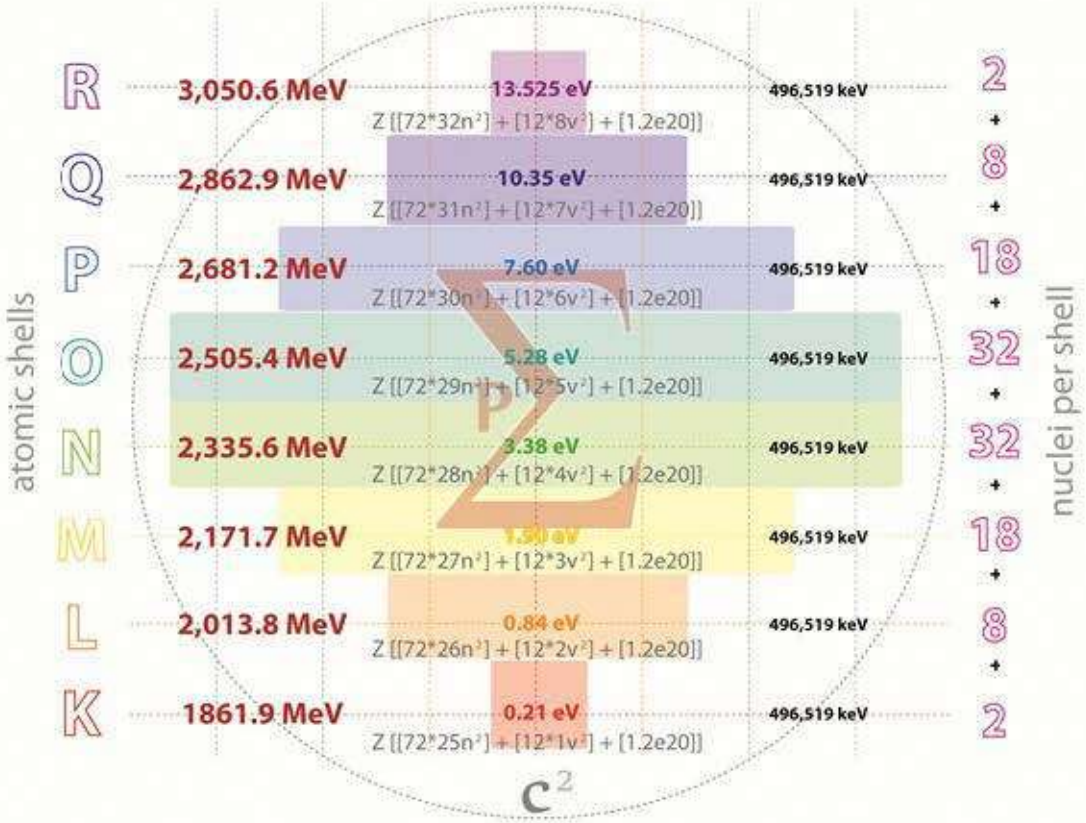
$$Z\,[[72n^2] + [12v^2] + [1.2e20]]$$

1,861,949 MeV **13.525 eV** **496,519 keV**

$2H^+$ $[72n^2]$ Z γ $[M_e v^2]$

Elemental mass-Matter [in MeV]

The atomic shell energy levels of Deuterium nuclei in elements



6,101 MeV
993 keV
En = -27.05 eV
+
22,903 MeV
3,972 keV
En = -82.8 eV
+
48,262 MeV
8,937 keV
En = -316.8 eV
+
80,174 MeV
15,888 keV
En = -168.96 eV
+
74,740 MeV
15,888 keV
En = -108.10 eV
+
39,092 MeV
8,937 keV
En = -34.2 eV
+
16,111 MeV
3,972 keV
En = -6.72 eV
+
3,724 MeV
993 keV
En = -0.42 eV

$[1.2e20]]$

e

Determines the spectral line [KEM field energies] of electrons bound to them

The relativistic rest mass-energy-Matter of all periodic elements

is the sum of the mass-energies of all atomic nuclei and spectral lines that comprise its mass-Matter topology as measured in any spatial co-ordinate system per unit of time

the rest mass-Matter of bound photo-electrons is velocity invariant

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Avagadro's number

1 KG mass
[of Matter]

6.022141579 e26
atoms in 1KG of Matter

1.660538841 e-27 kg
atomic rest mass-Matter

Hydrogen

01

using SI units Avagadro's number can be expressed exactly as the inverse rest mass of Hydrogen

Weighted atomic mass

Carbon

12

5.019789213 e25
atoms in 1KG of Matter

6.02214078 e 23

1.99211552 e-26 kg
atomic rest mass-Matter

Tetryonic charge geometries make weighted atomic mass measurements and calculations obsolete

22,506 1/12 of Carbon 12 [Graphene] is not equal to 1 Hydrogen atom 22,512
(Deuterium is the building block of all atomic elements)

International Avagadro project

1.966225348 e25
atoms in 1KG of Matter

5.085887033 e-26 kg
atomic rest mass-Matter

Silicon

28

The gram was originally defined in 1795 as the mass of one cubic centimeter of water at 4°C,
making the kilogram equal to the mass of one liter of water.

The prototype kilogram, manufactured in 1799 and from which the current kilogram is based
has a mass equal to the mass of 1.000025 liters of water

In recent years two major experiments, namely the Watt balance & Avagadro projects, have been attempting to
measure and define 1KG of mass-Matter in terms of electrical force and the number of atoms respectively
in order to better define 1KG of mass-Matter precisely for all future physical references

Platinum

191

2.817950081 e24
atoms in 1KG of Matter
3.181804449 e23

90% Pt
10% Ir

La Grande K

The La grande K is an alloy of 90% Platinum & 10% Iridium that has been slowly losing mass since its manufacture

3.1893811012 e-25 kg
atomic rest mass-Matter
3.142870708 e-25 kg

All atomic rest masses are for atoms at absolute zero and any deviation is a measure of the topological Matter's Kinetic energy content [chemical energy, KEM fields and/or spectral lines]

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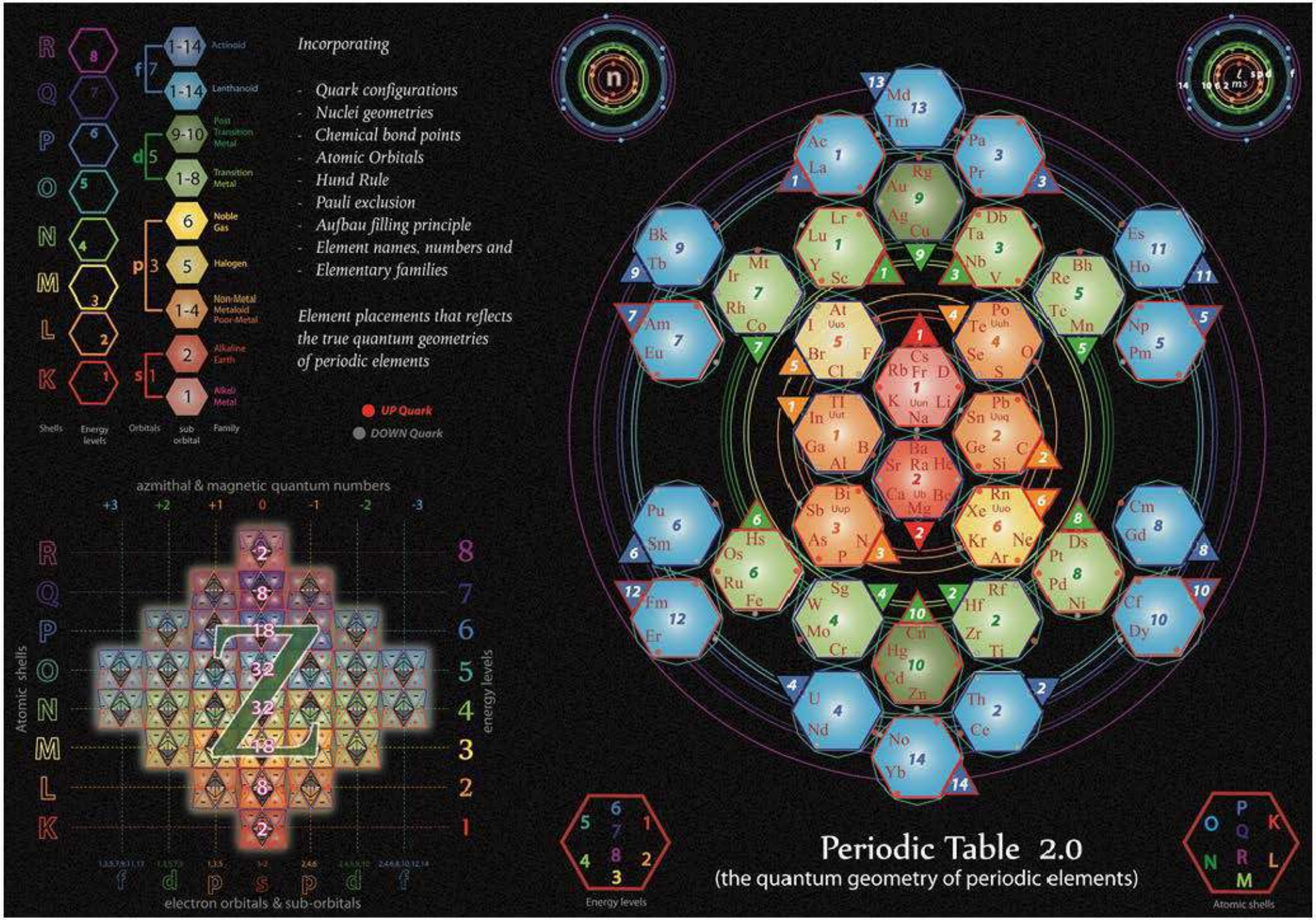

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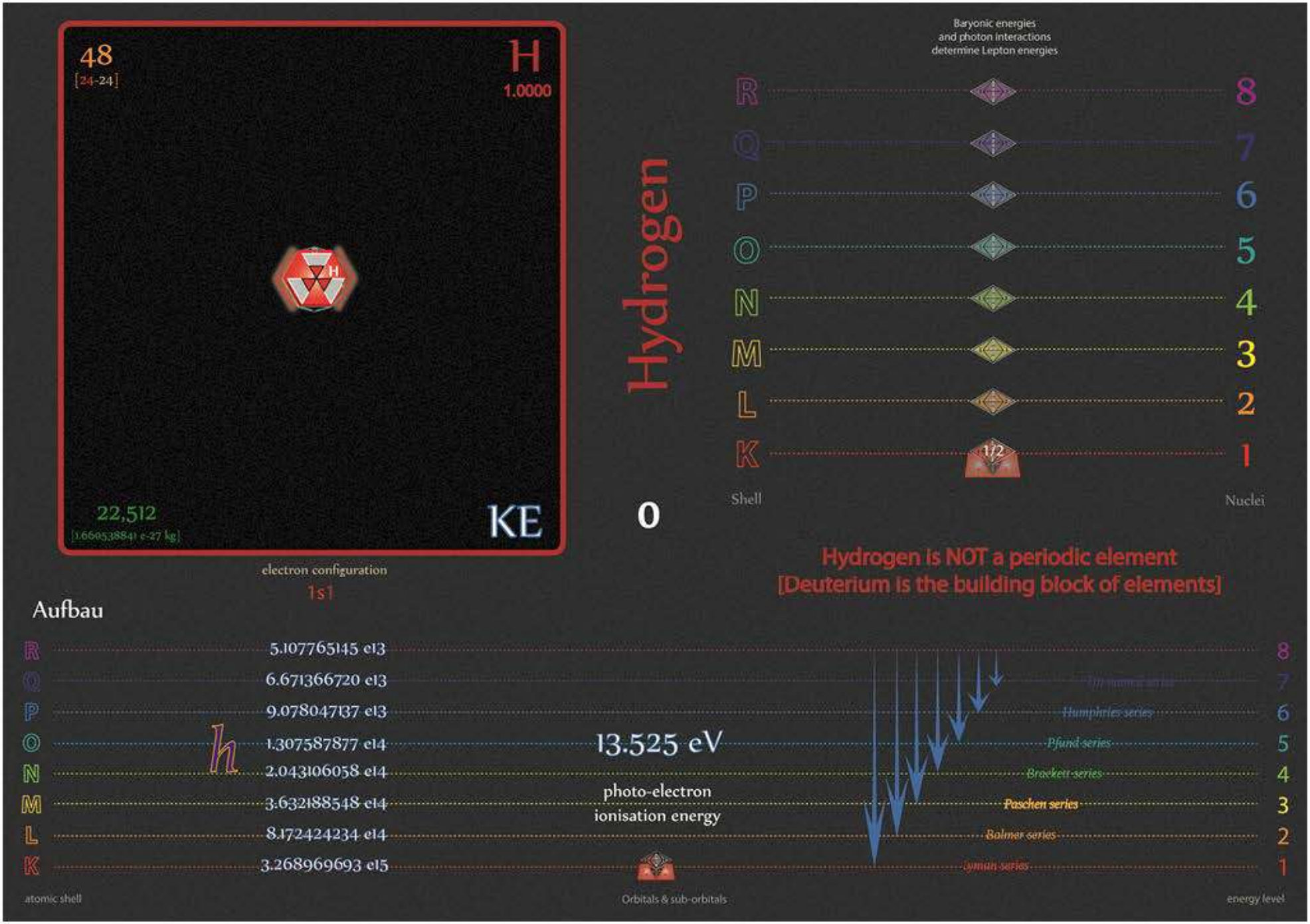

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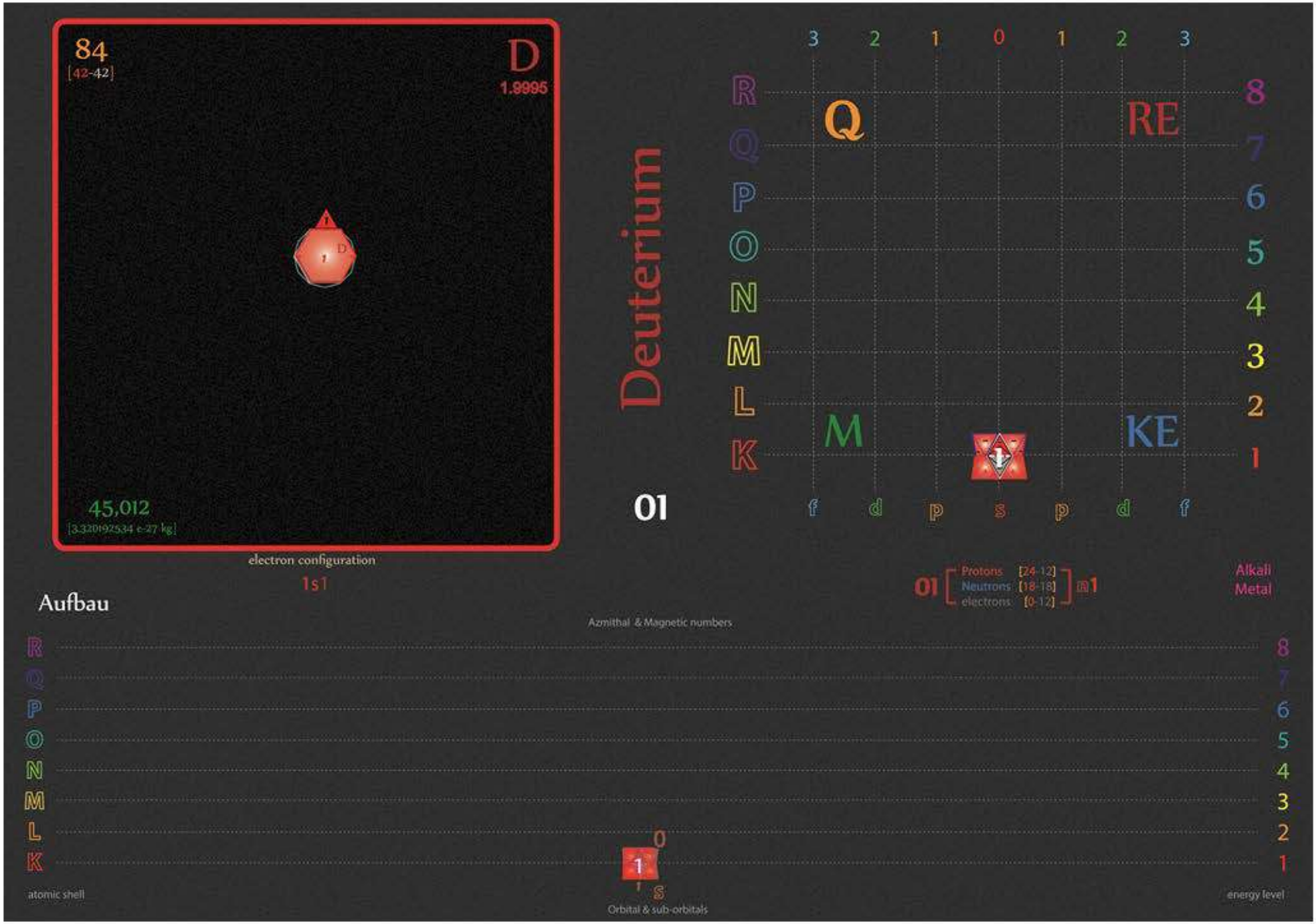

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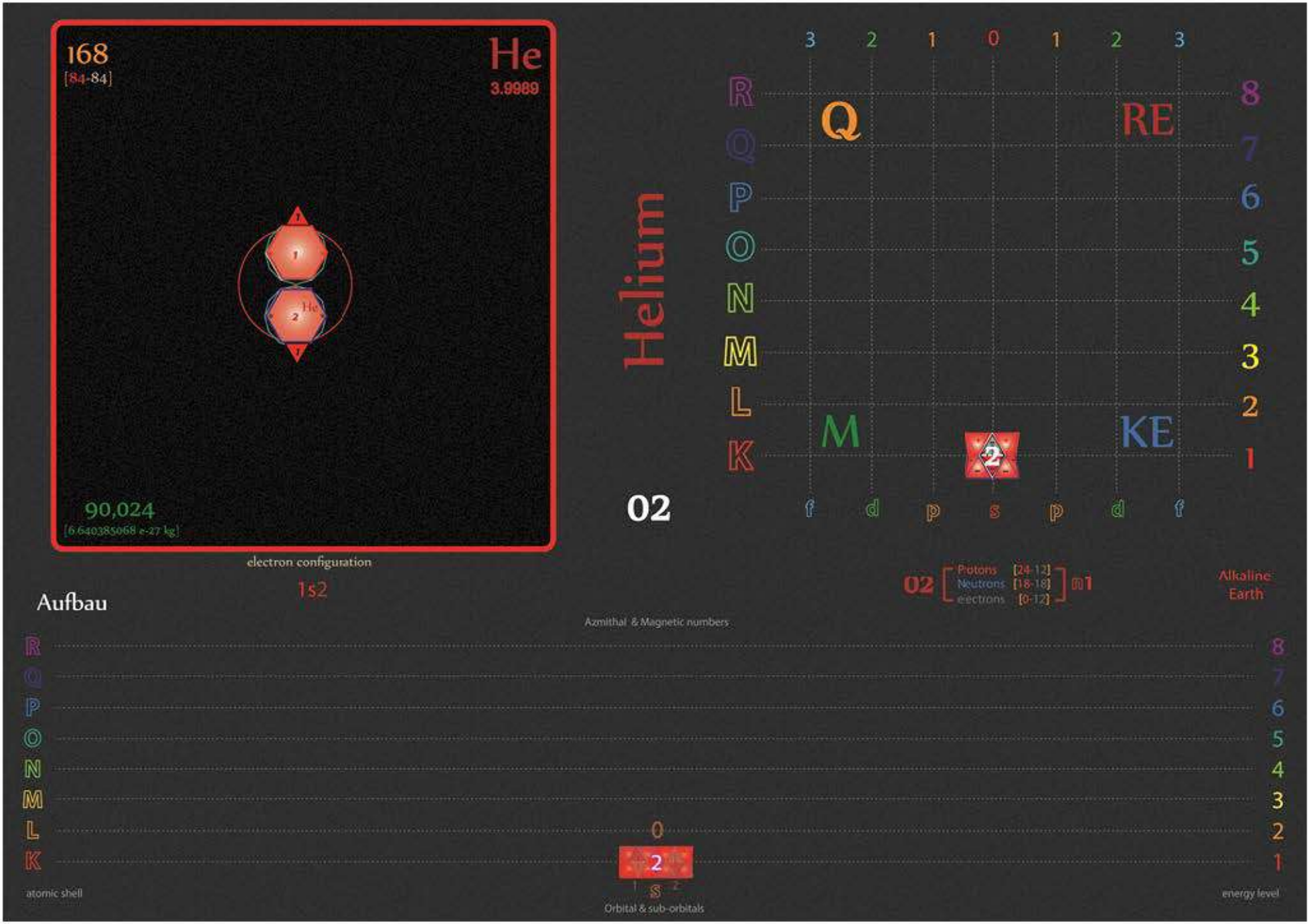

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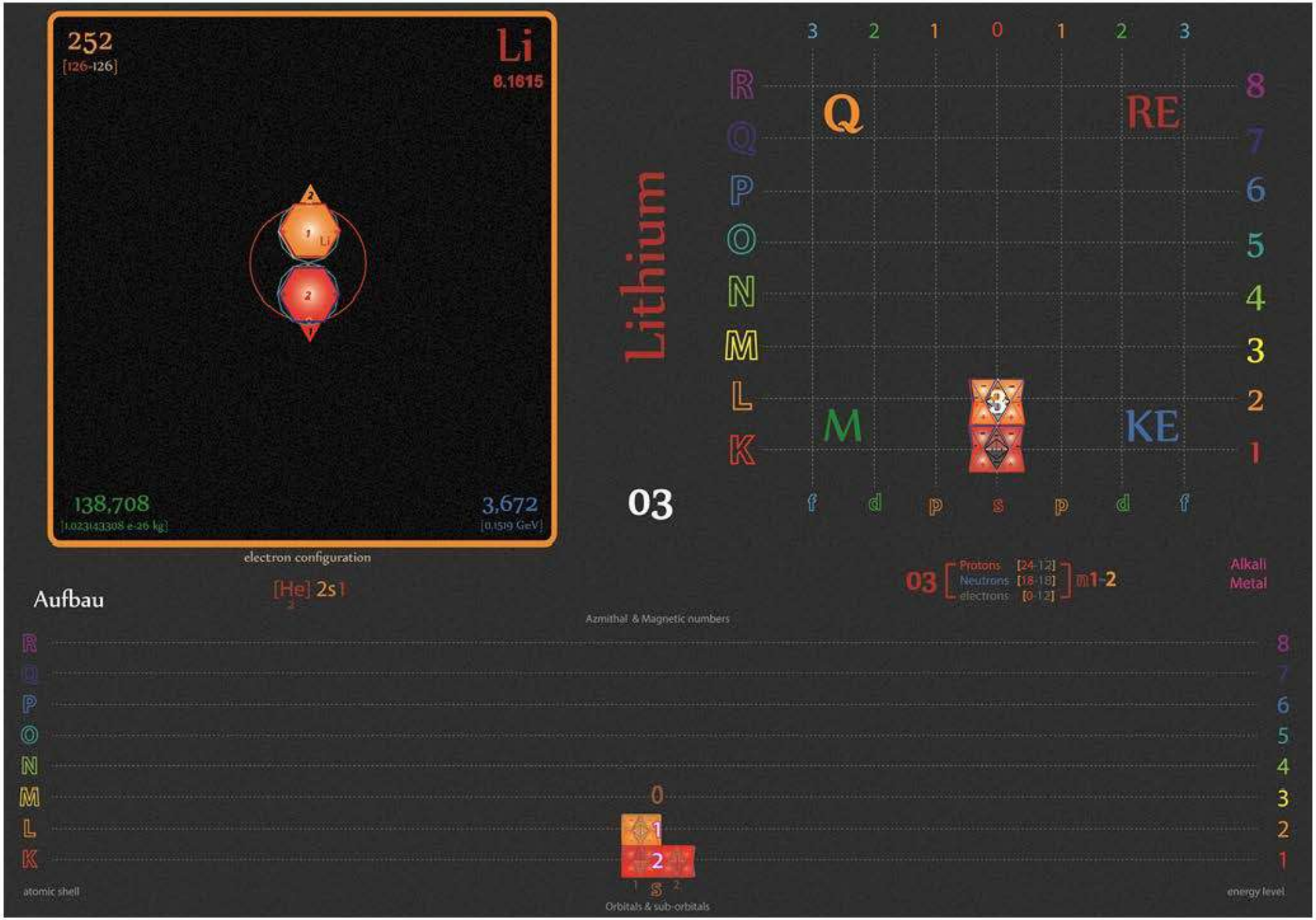

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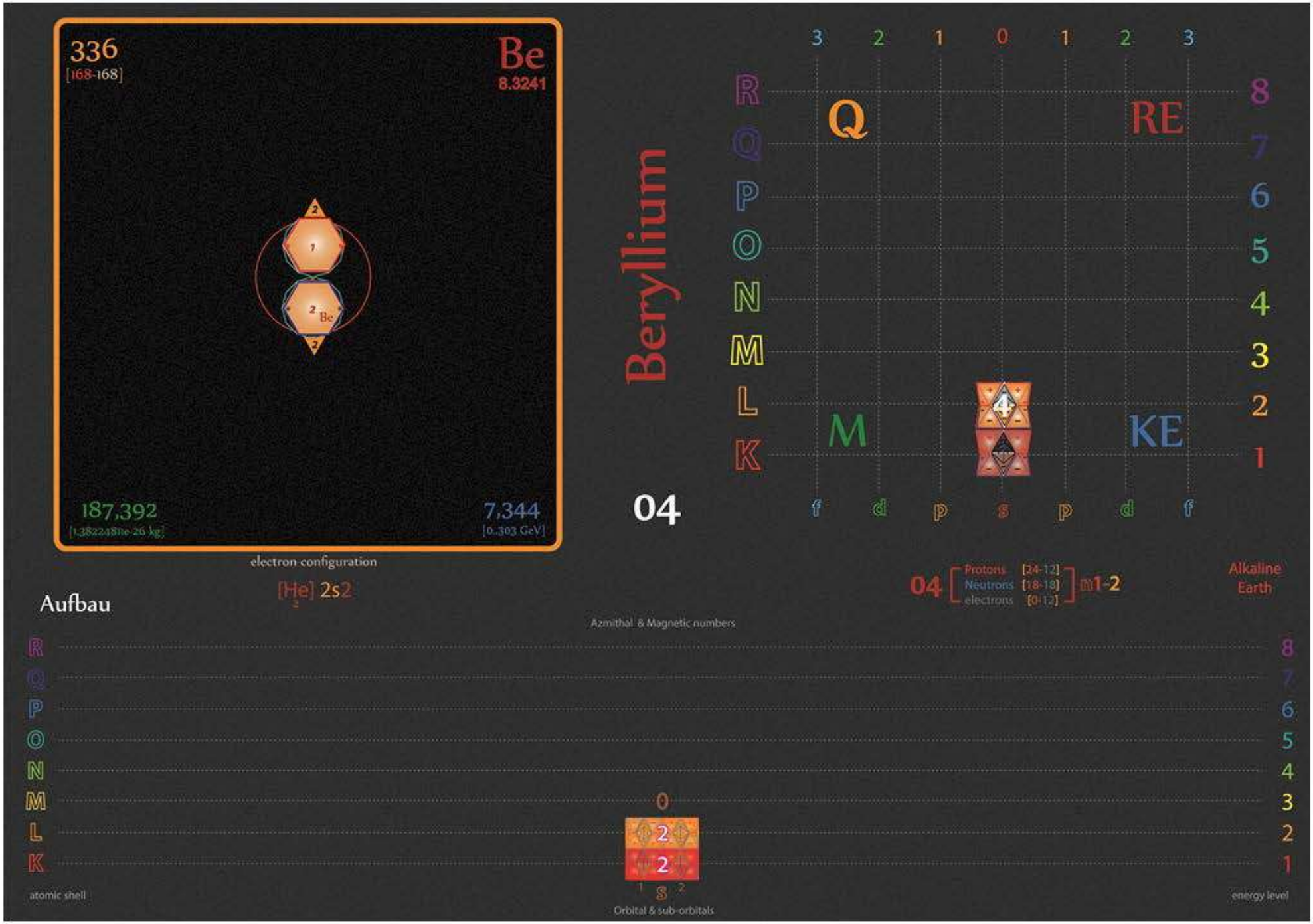

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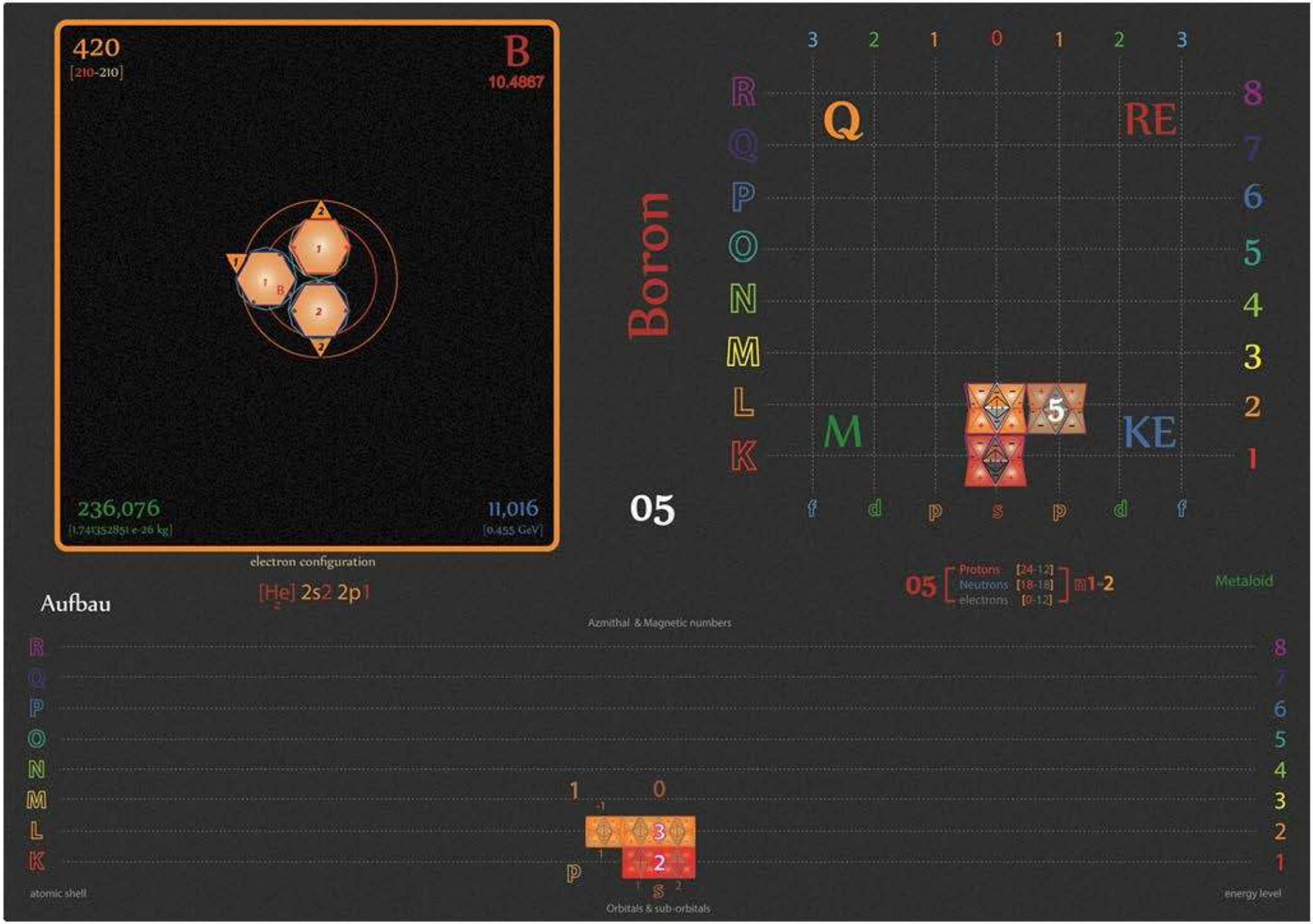

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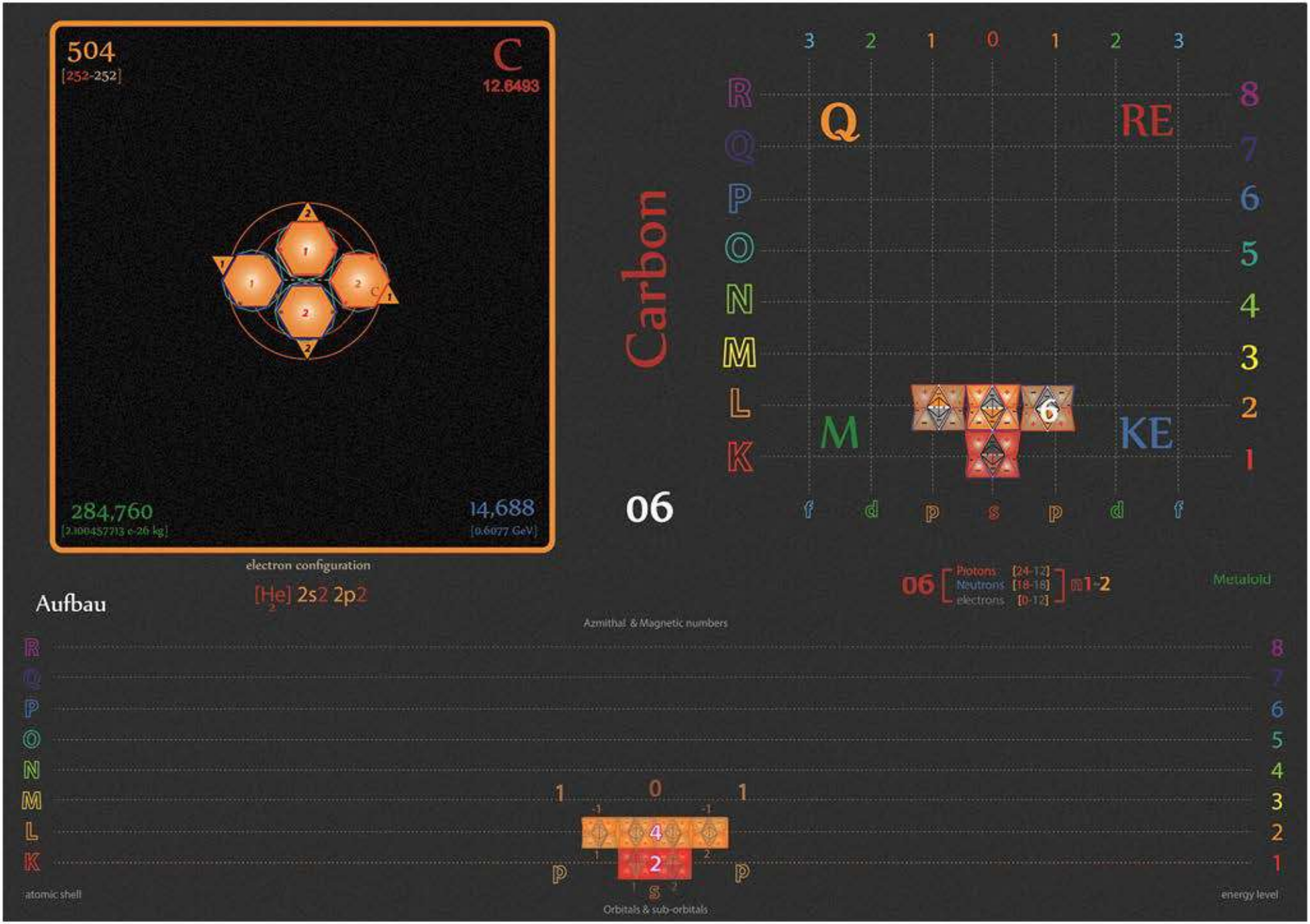

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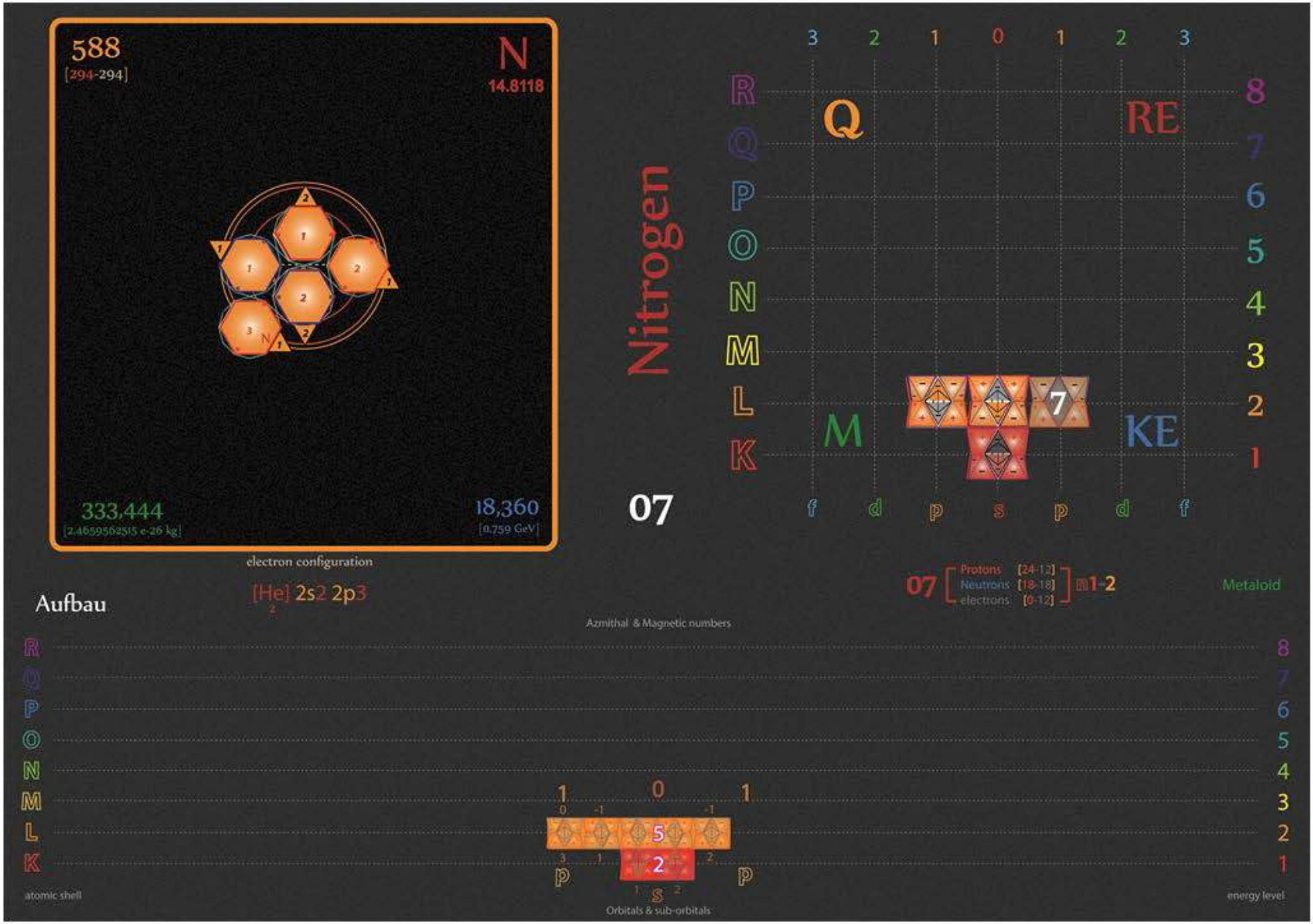

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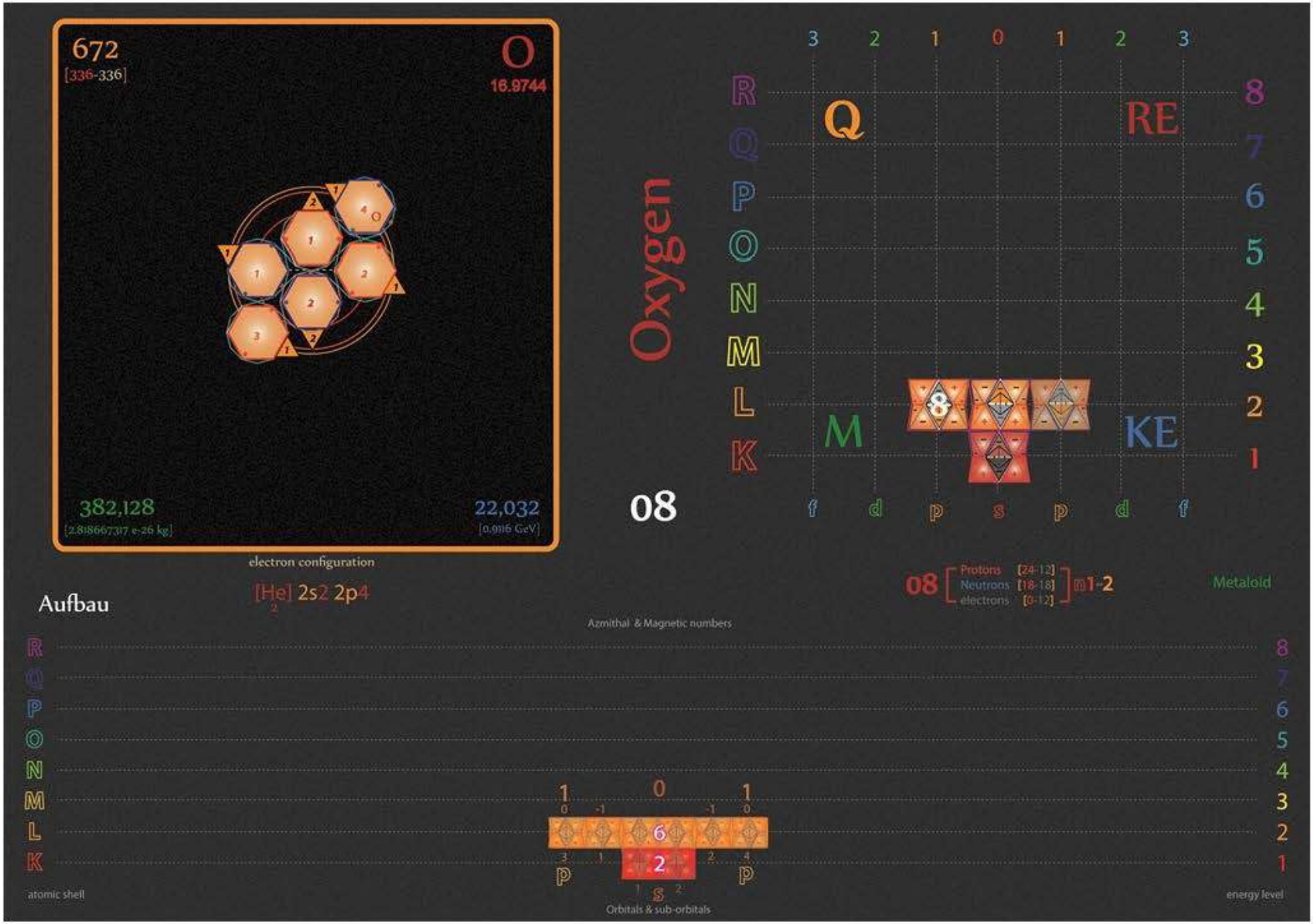

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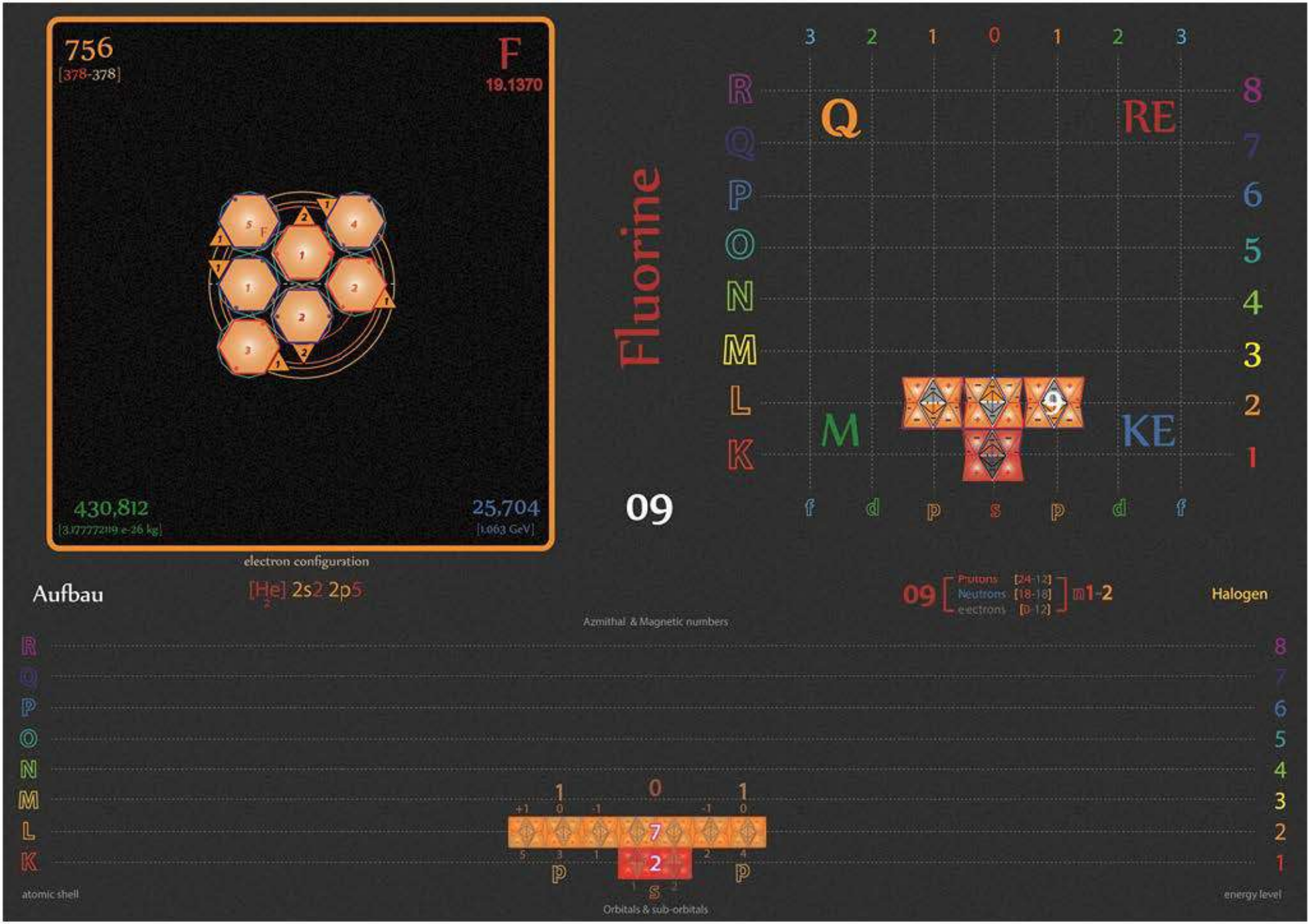

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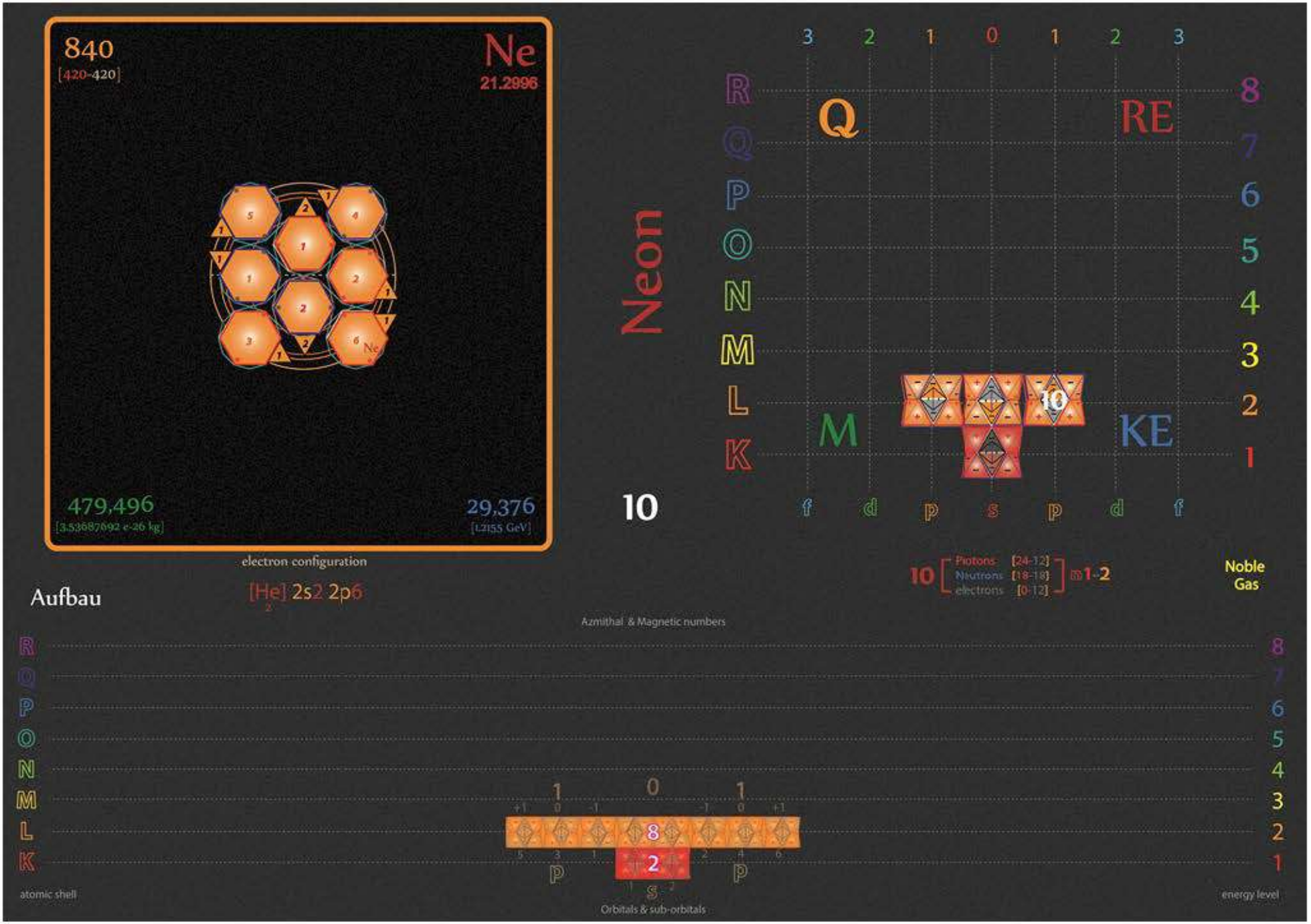

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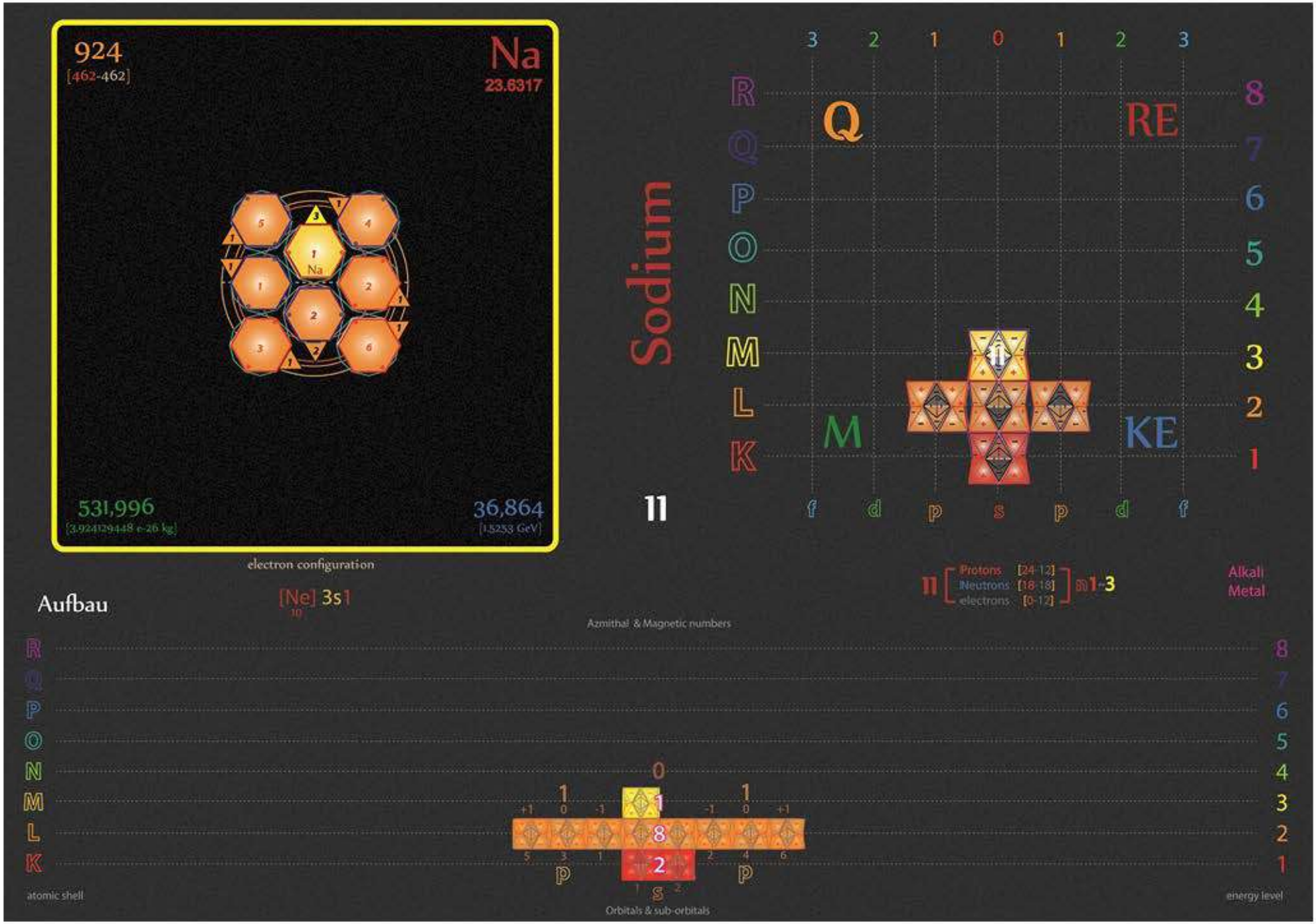

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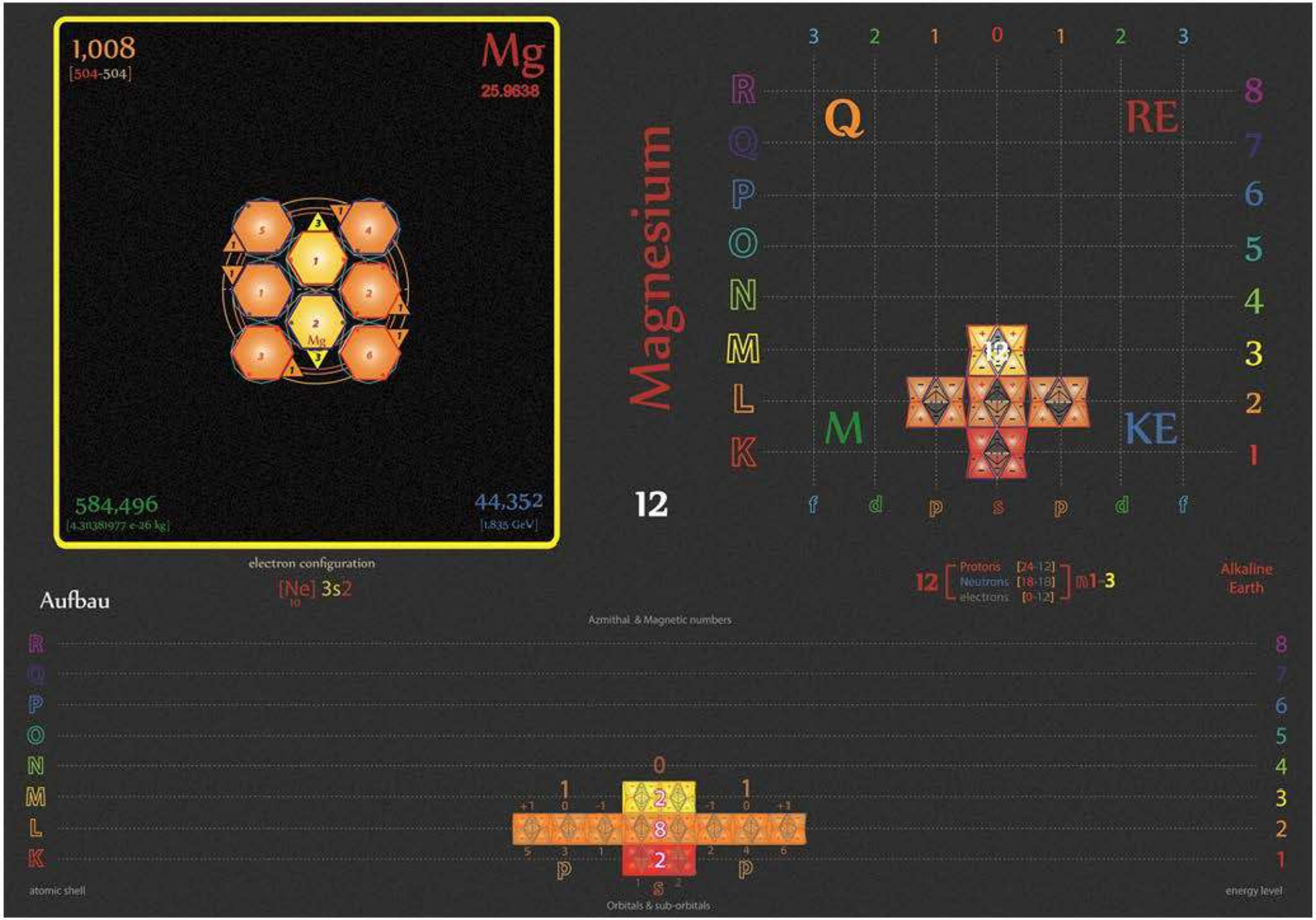

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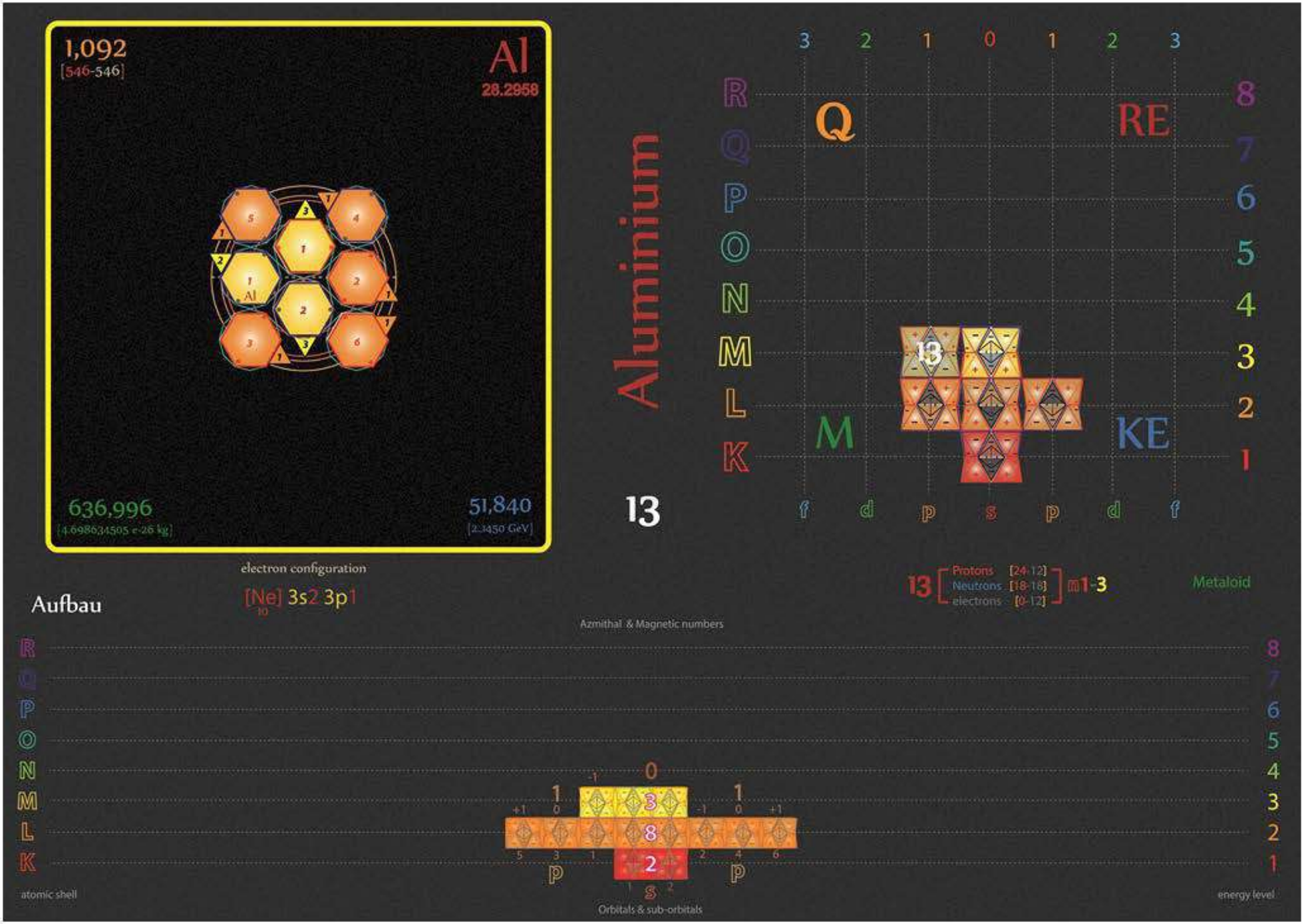

Tetryonics 51.13 - Aluminium atom

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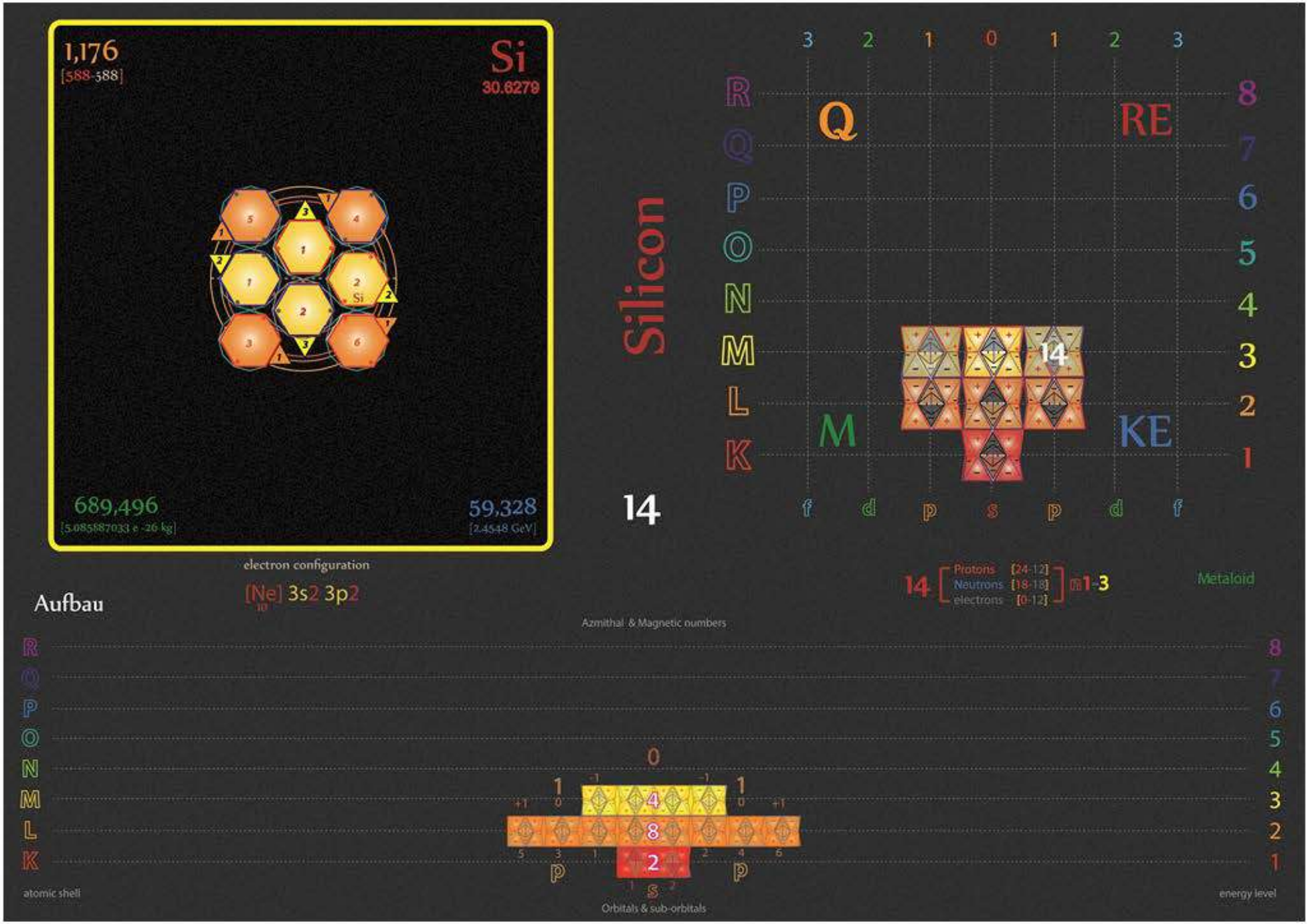

Tetryonics 51.14 - Silicon atom

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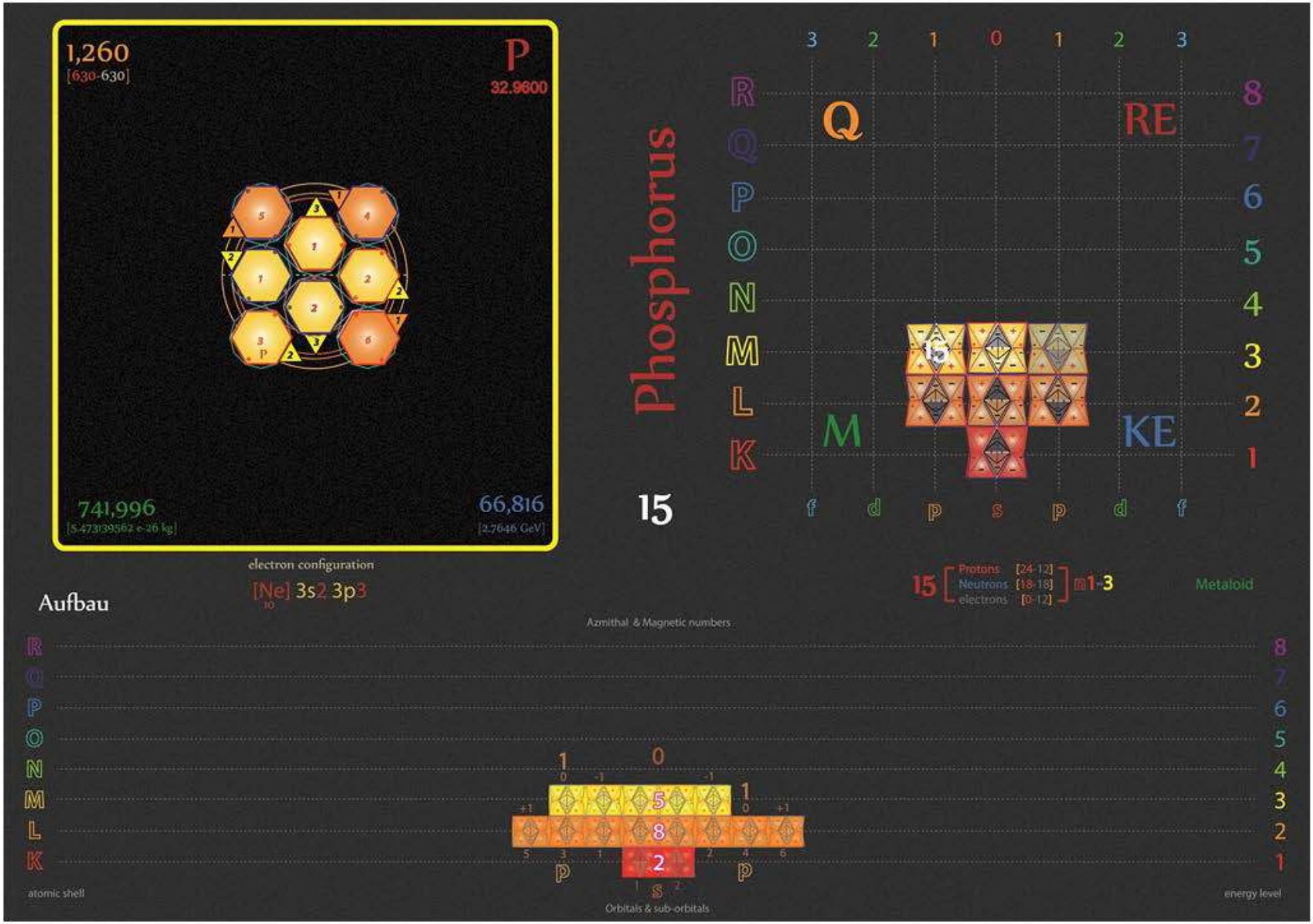

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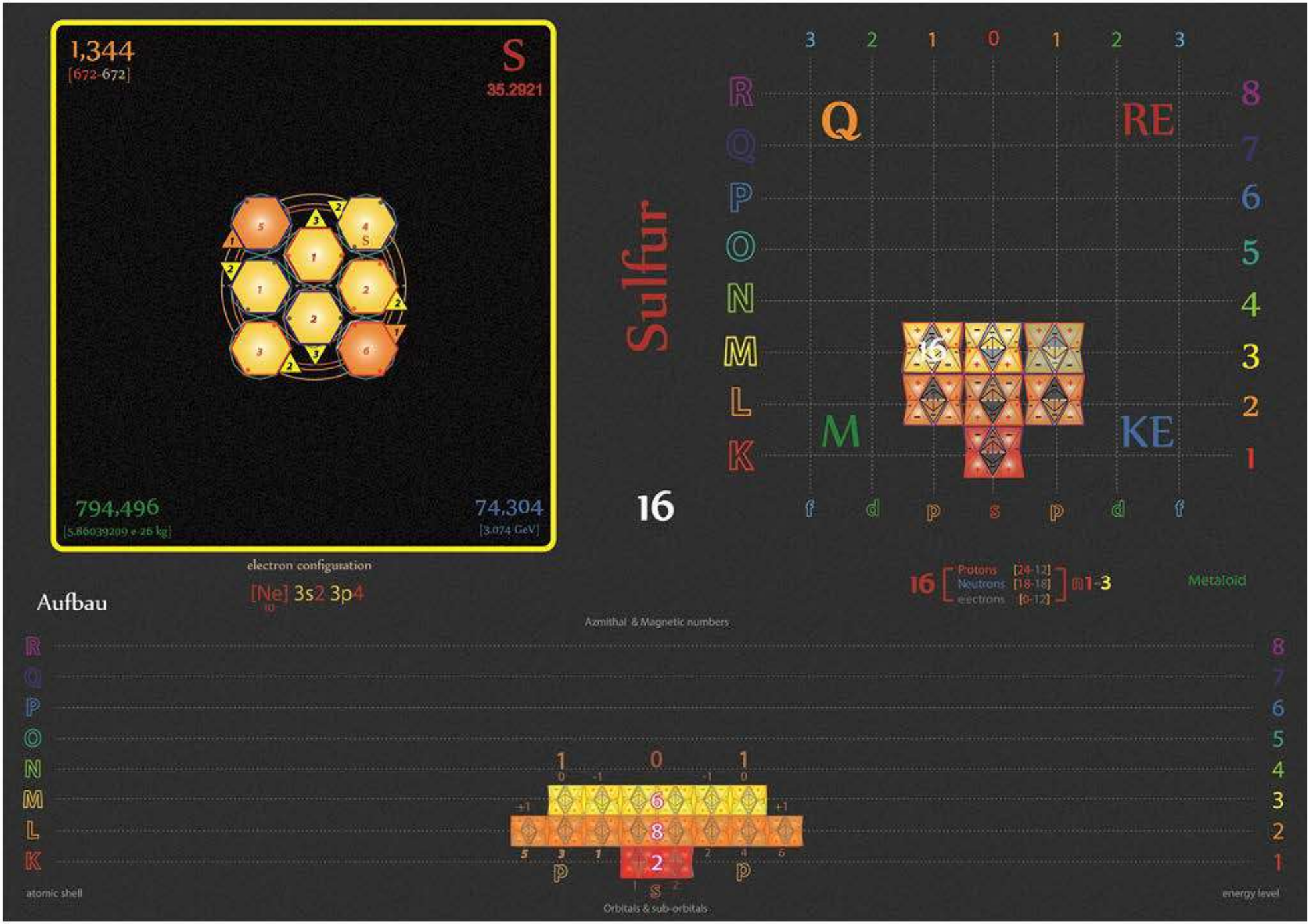

Tetryonics 51.16 - Sulfur atom

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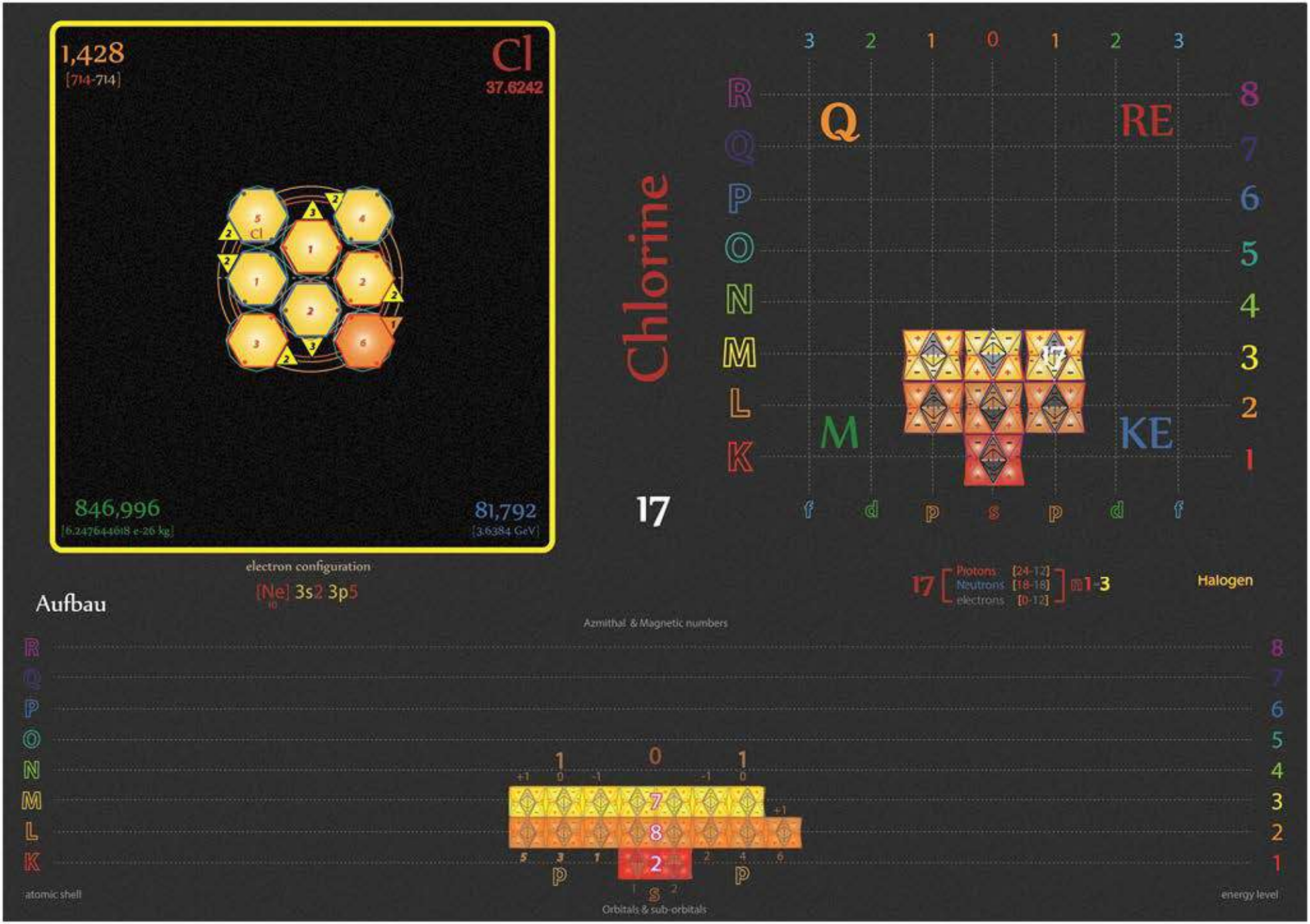

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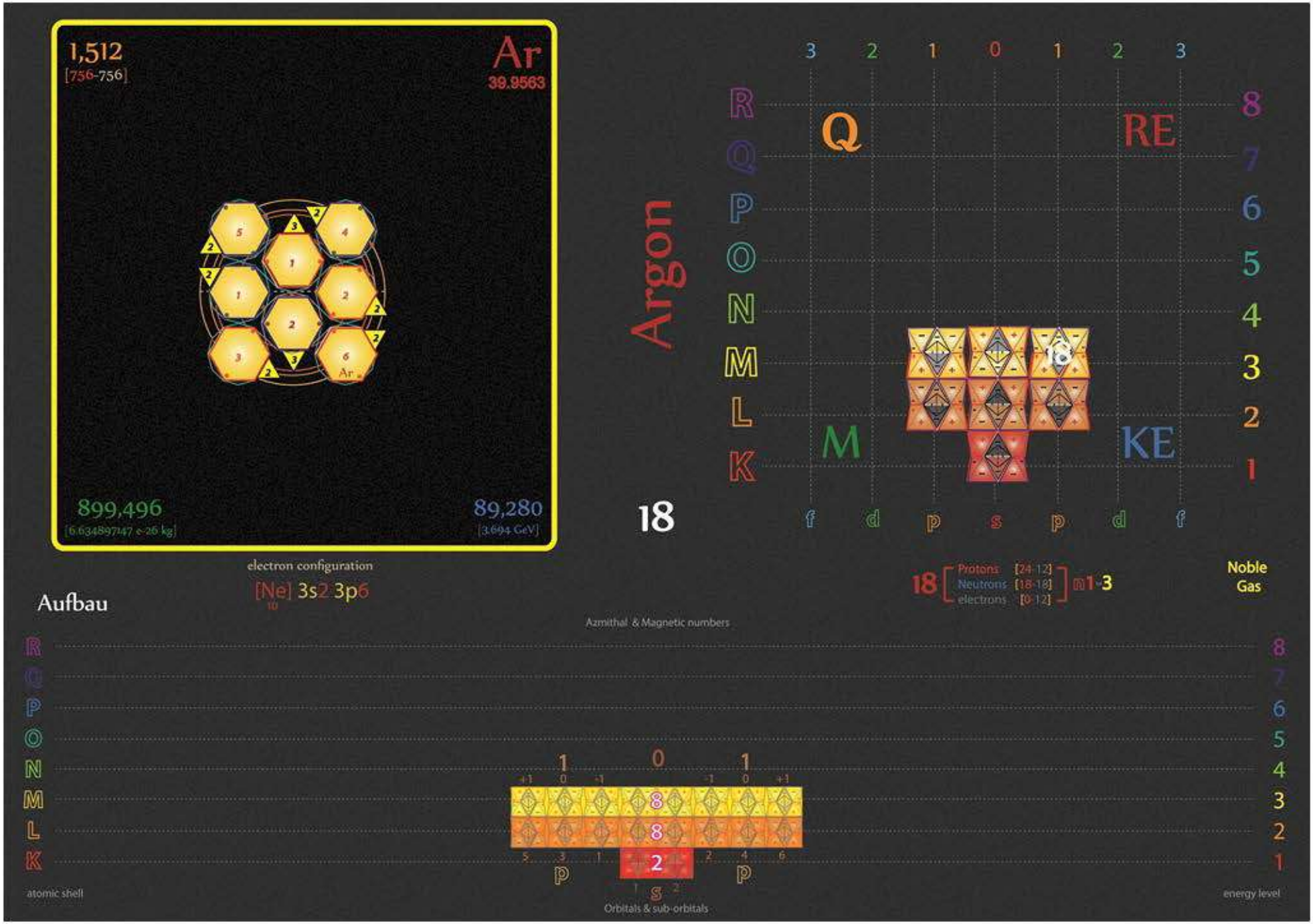

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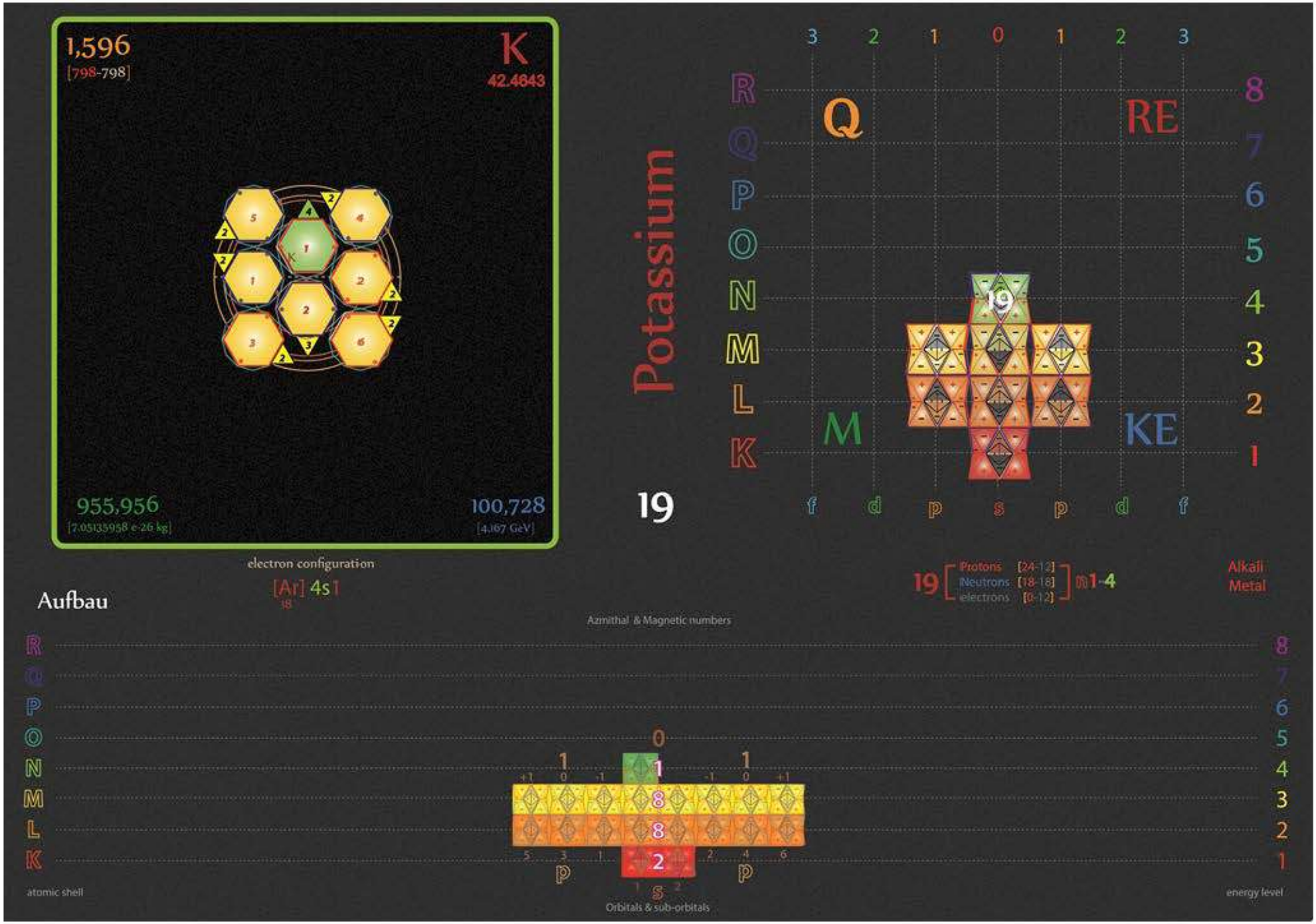

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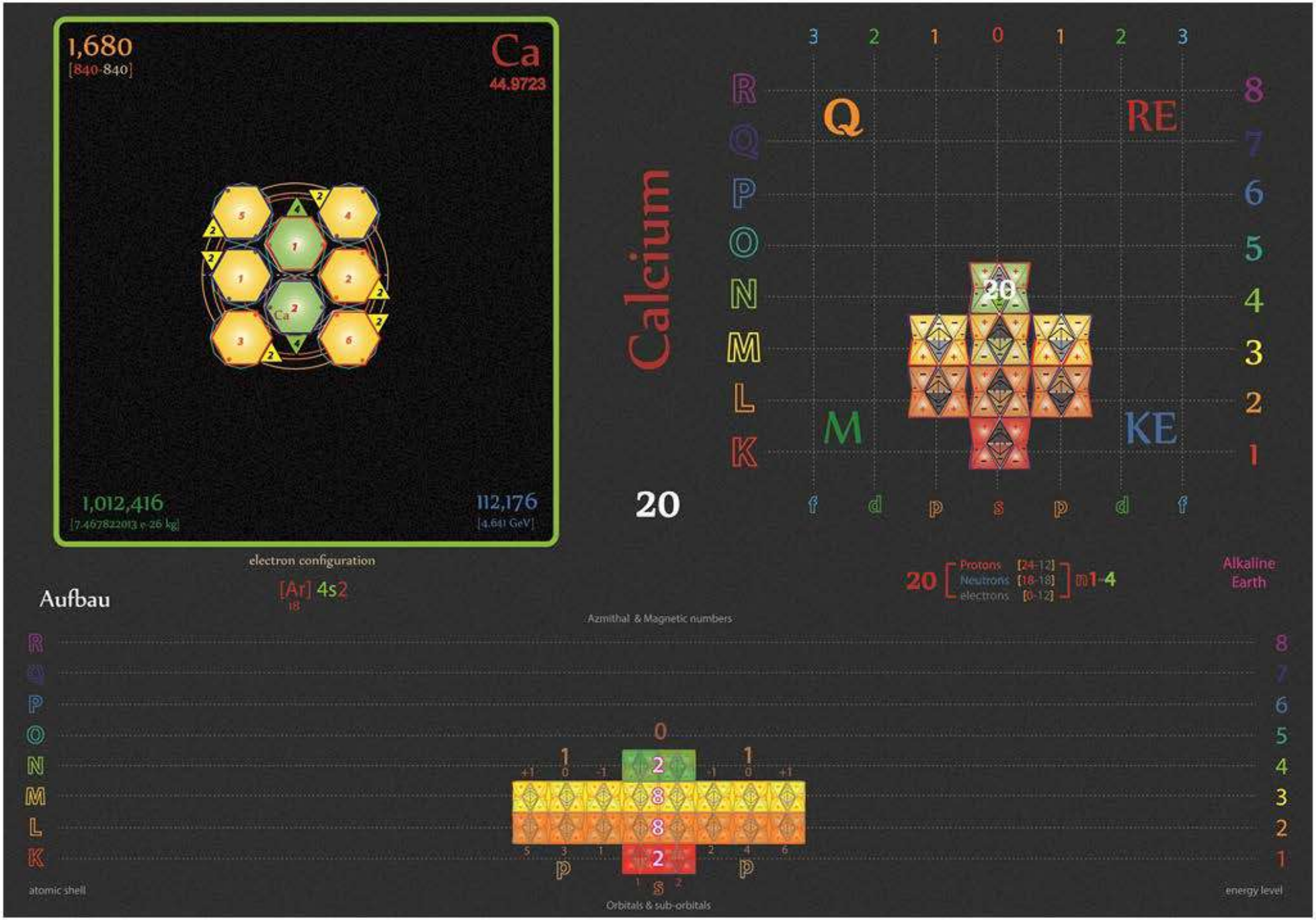

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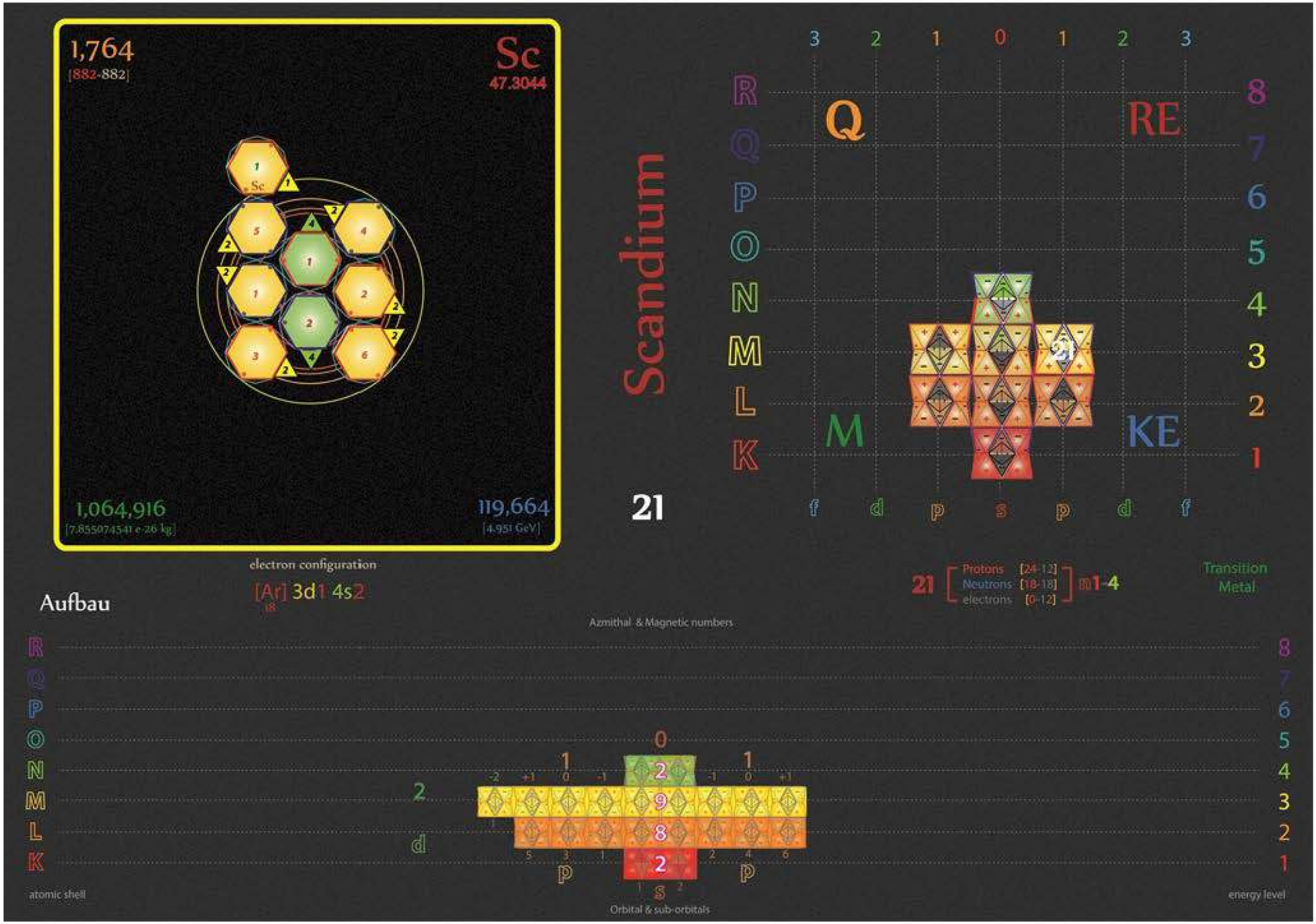

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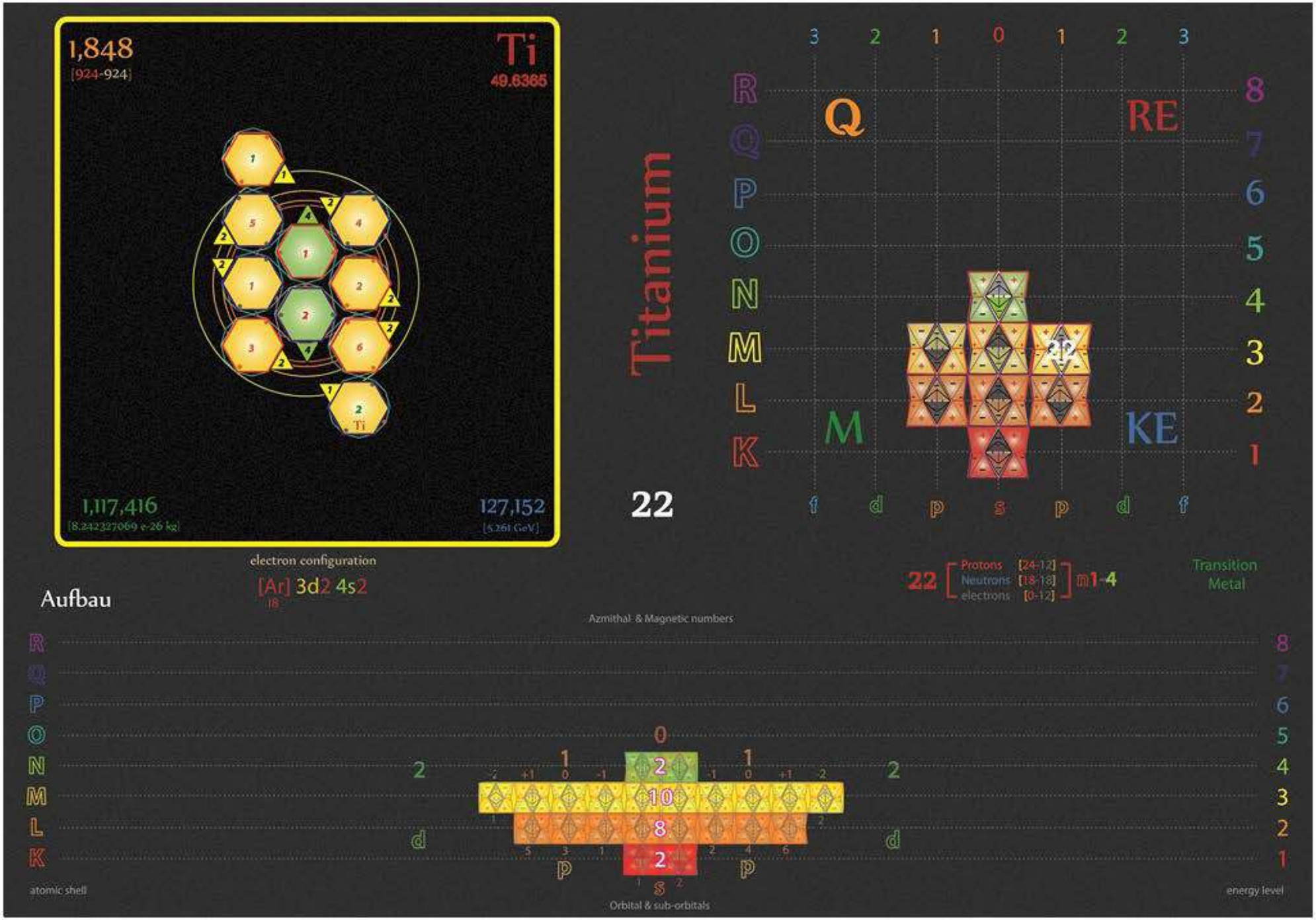

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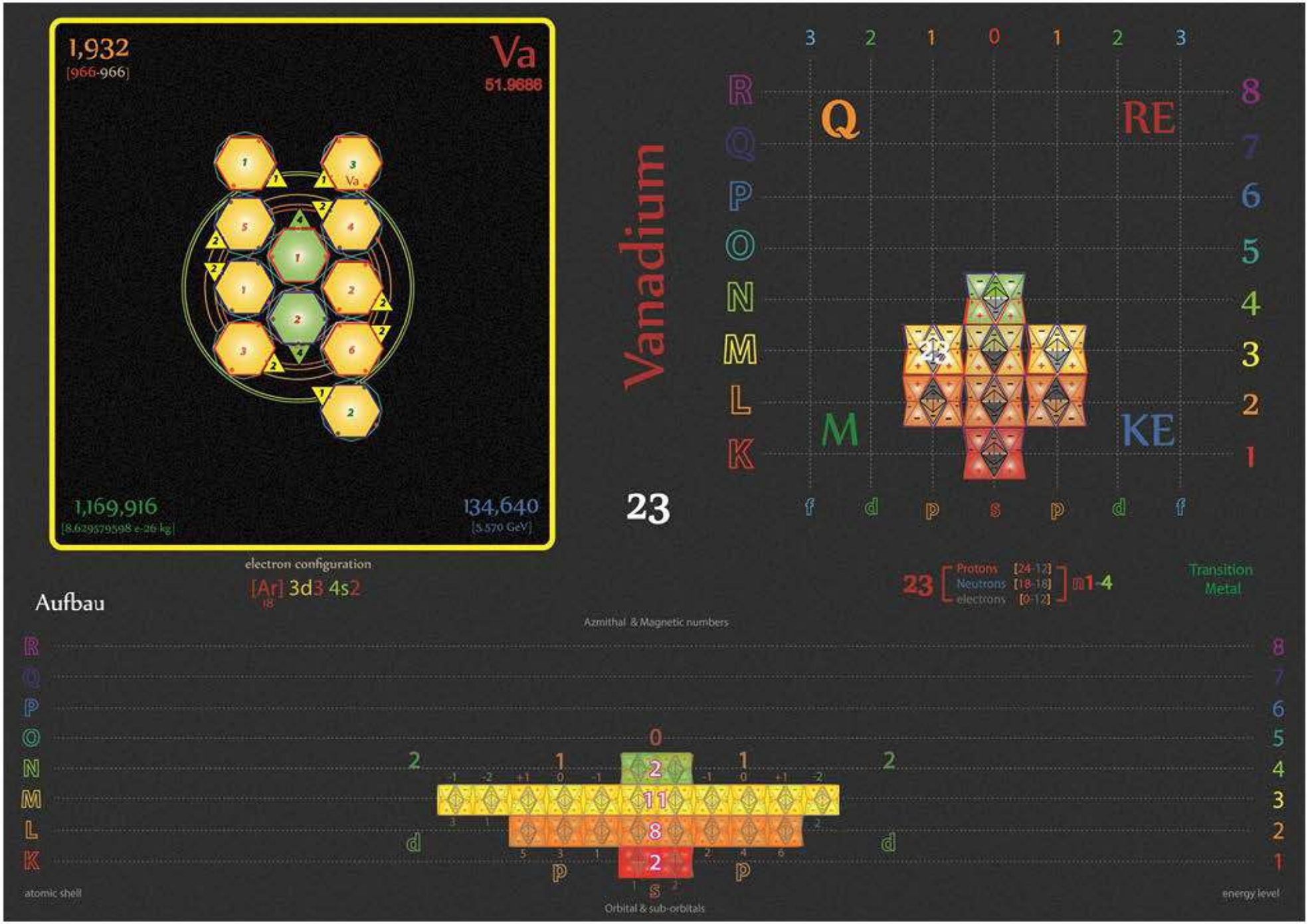

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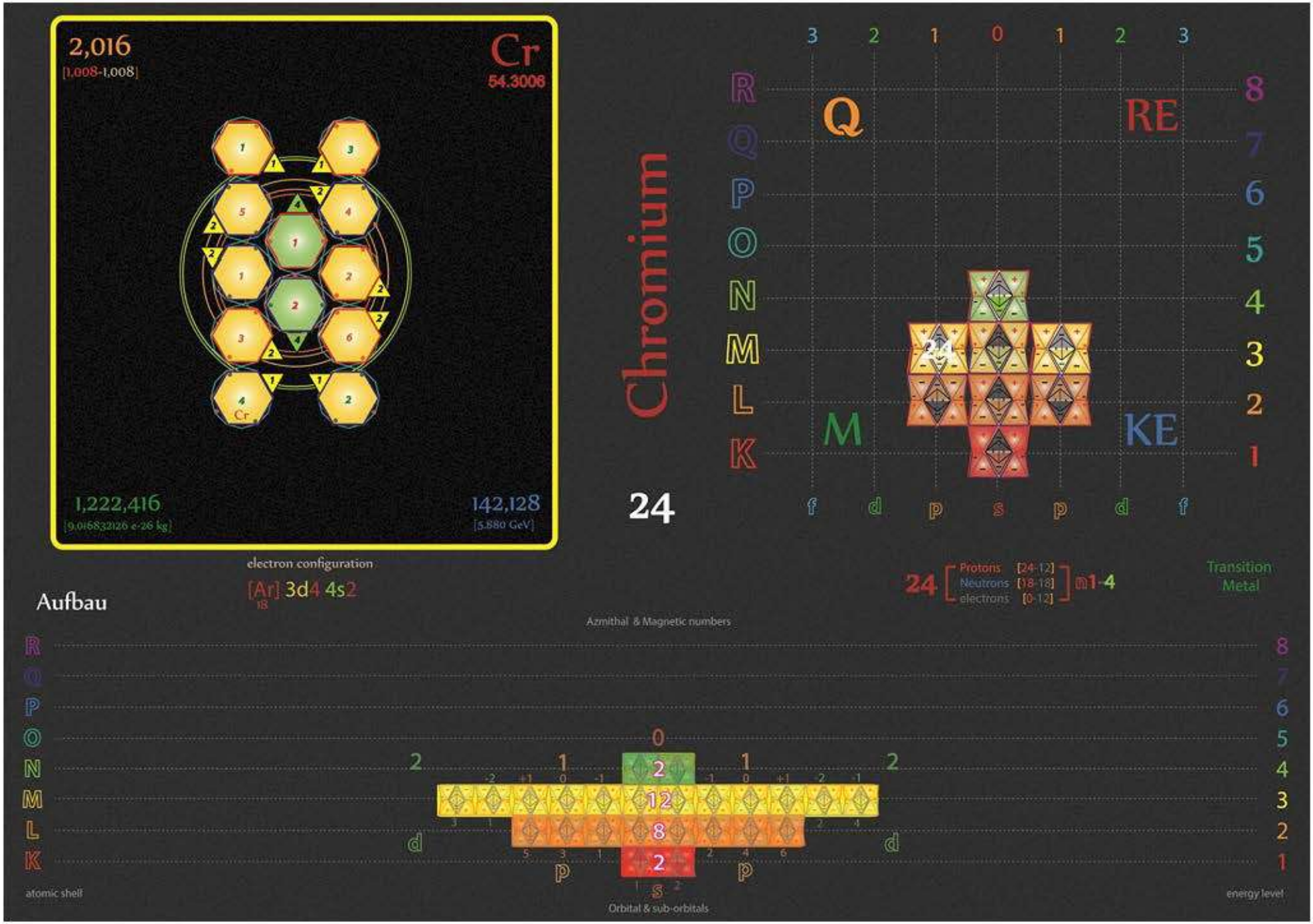

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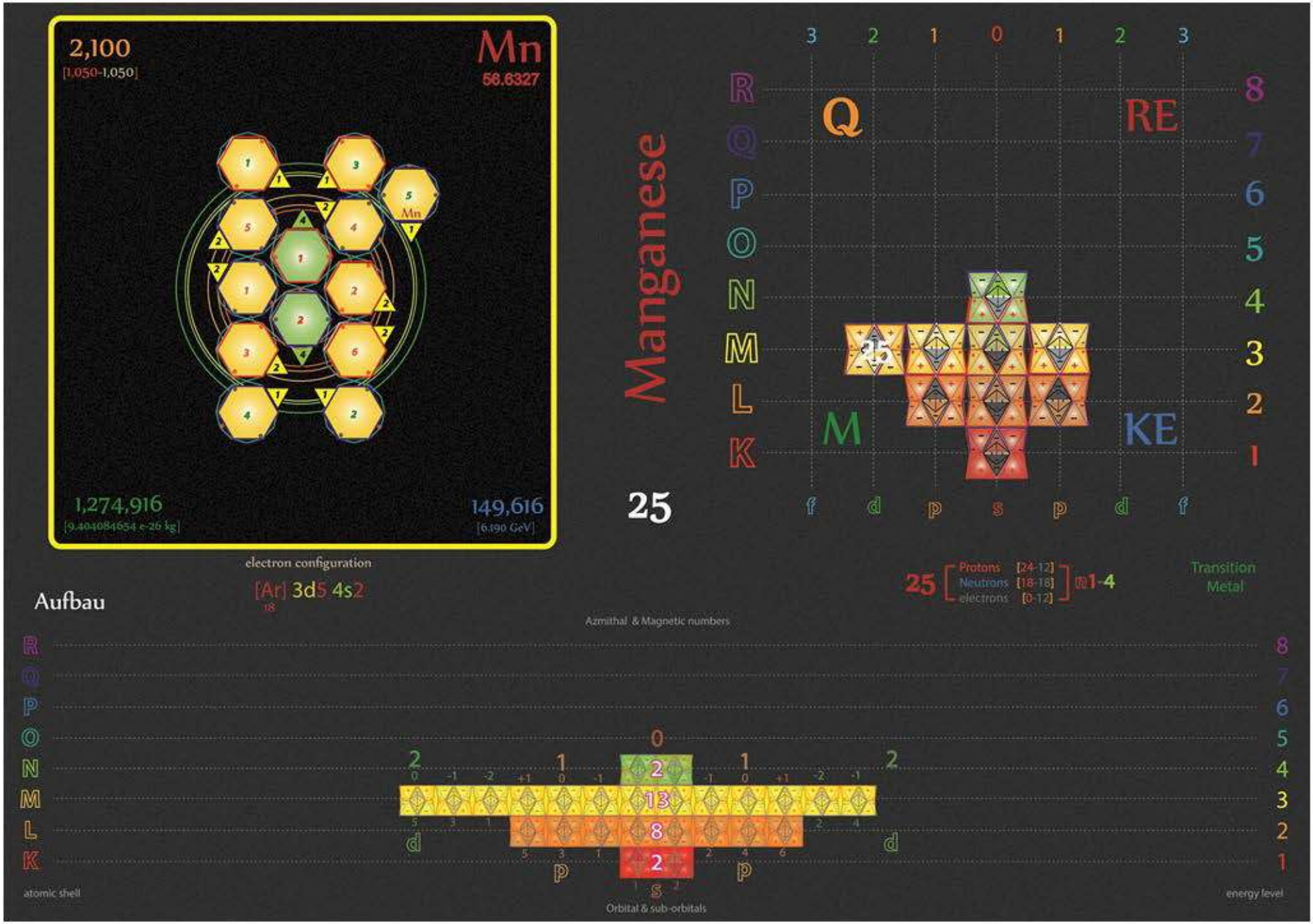

Tetryonics 51.25 - Manganese atom

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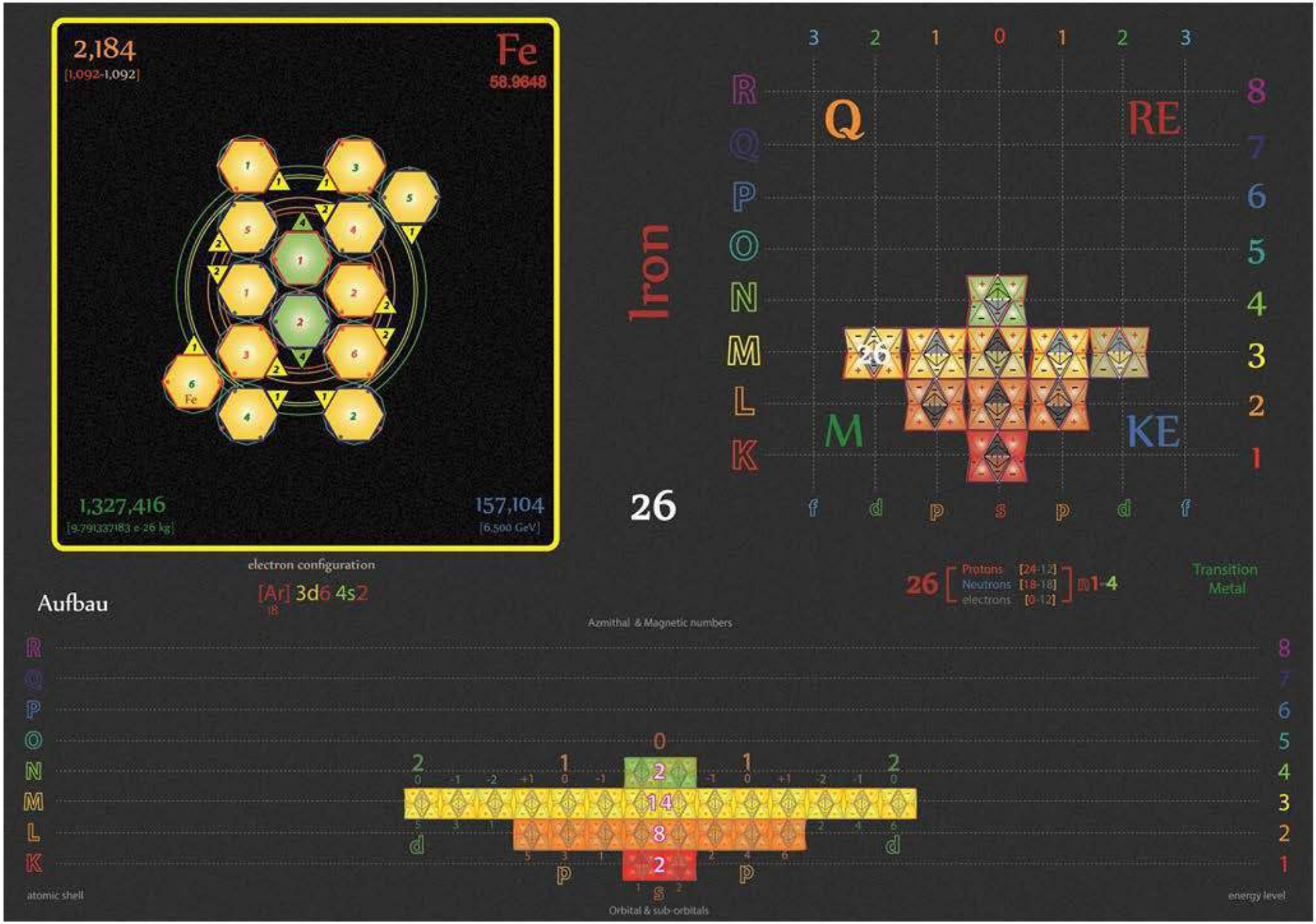

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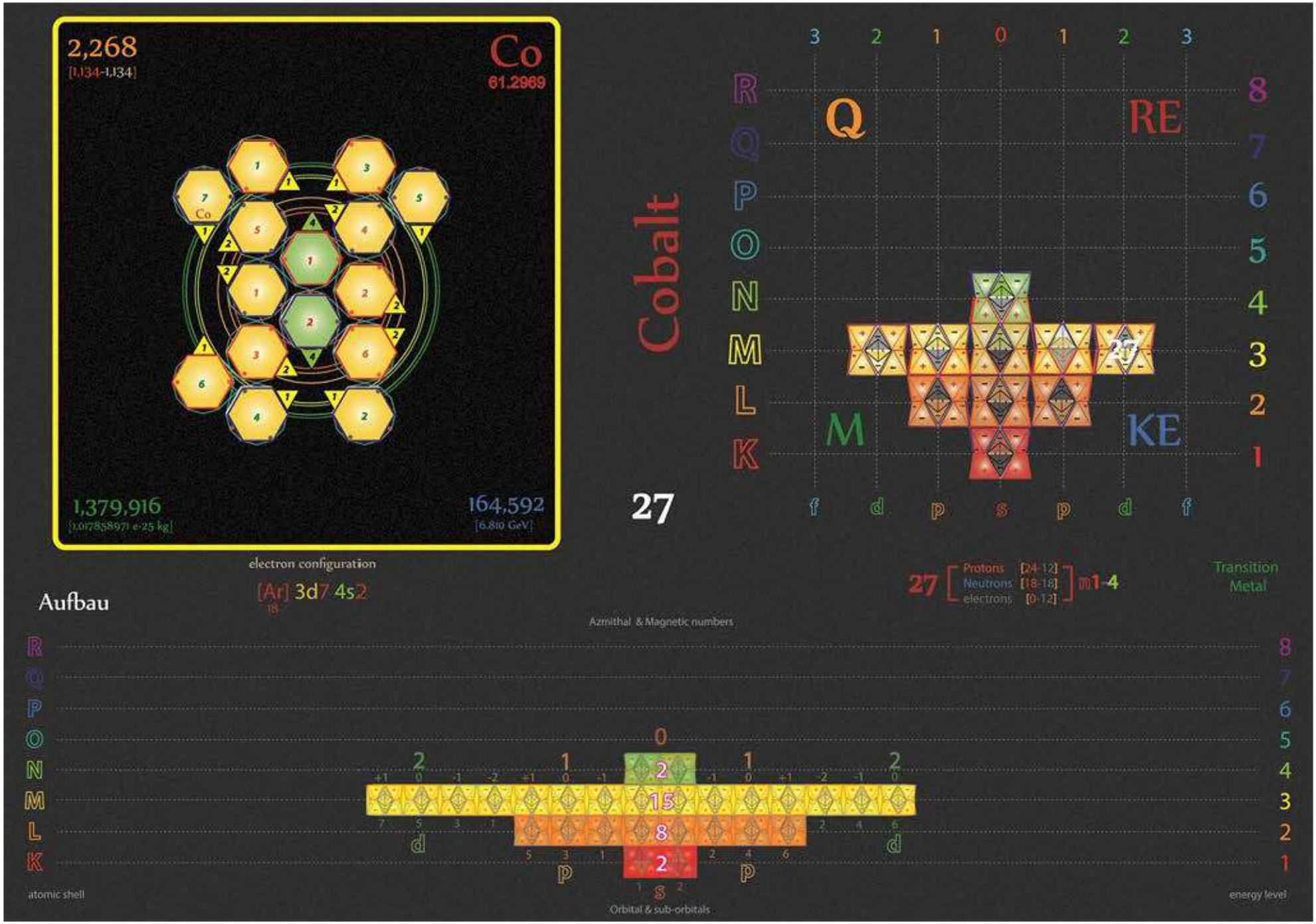

Tetryonics 51.27 - Cobalt atom

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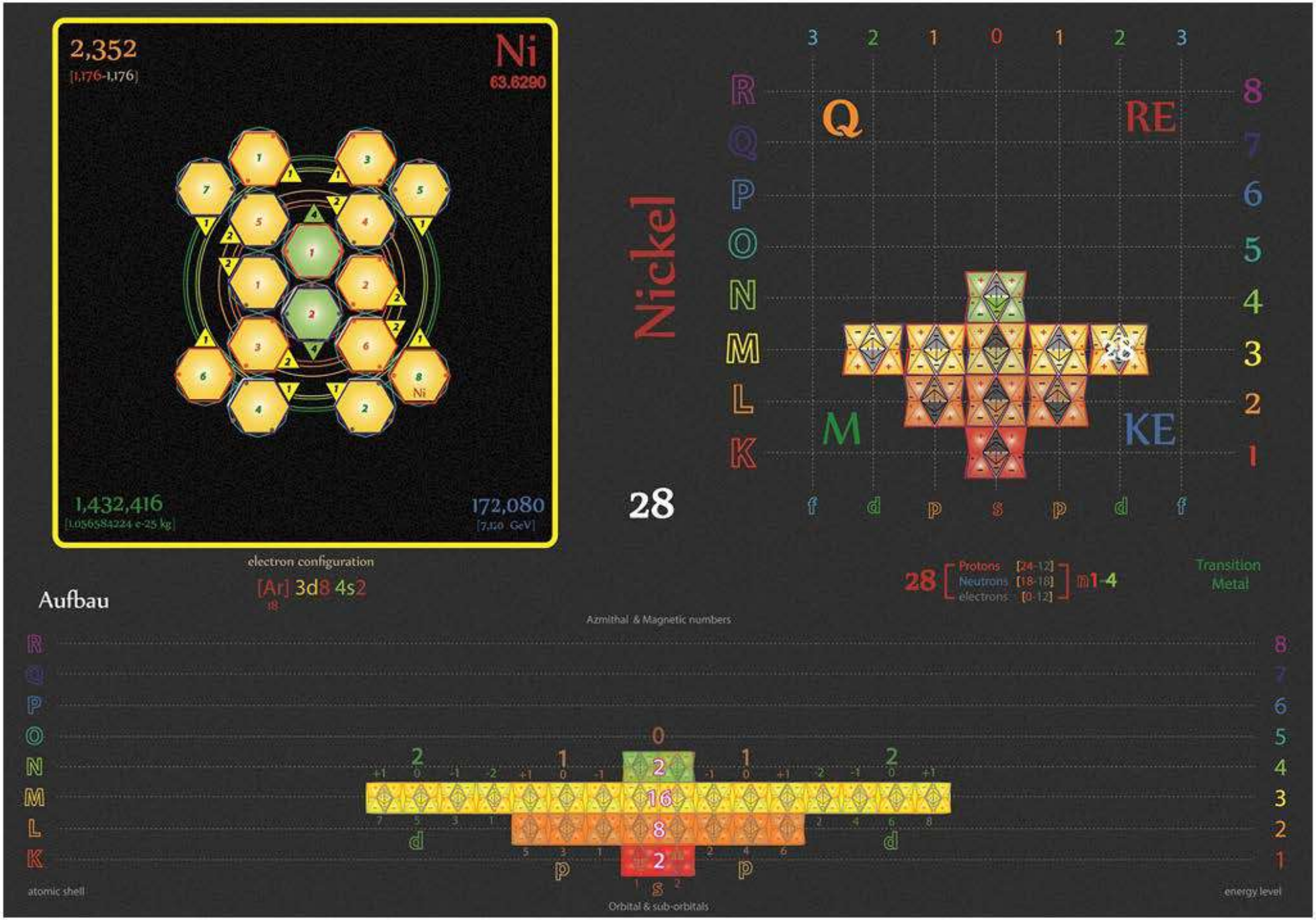

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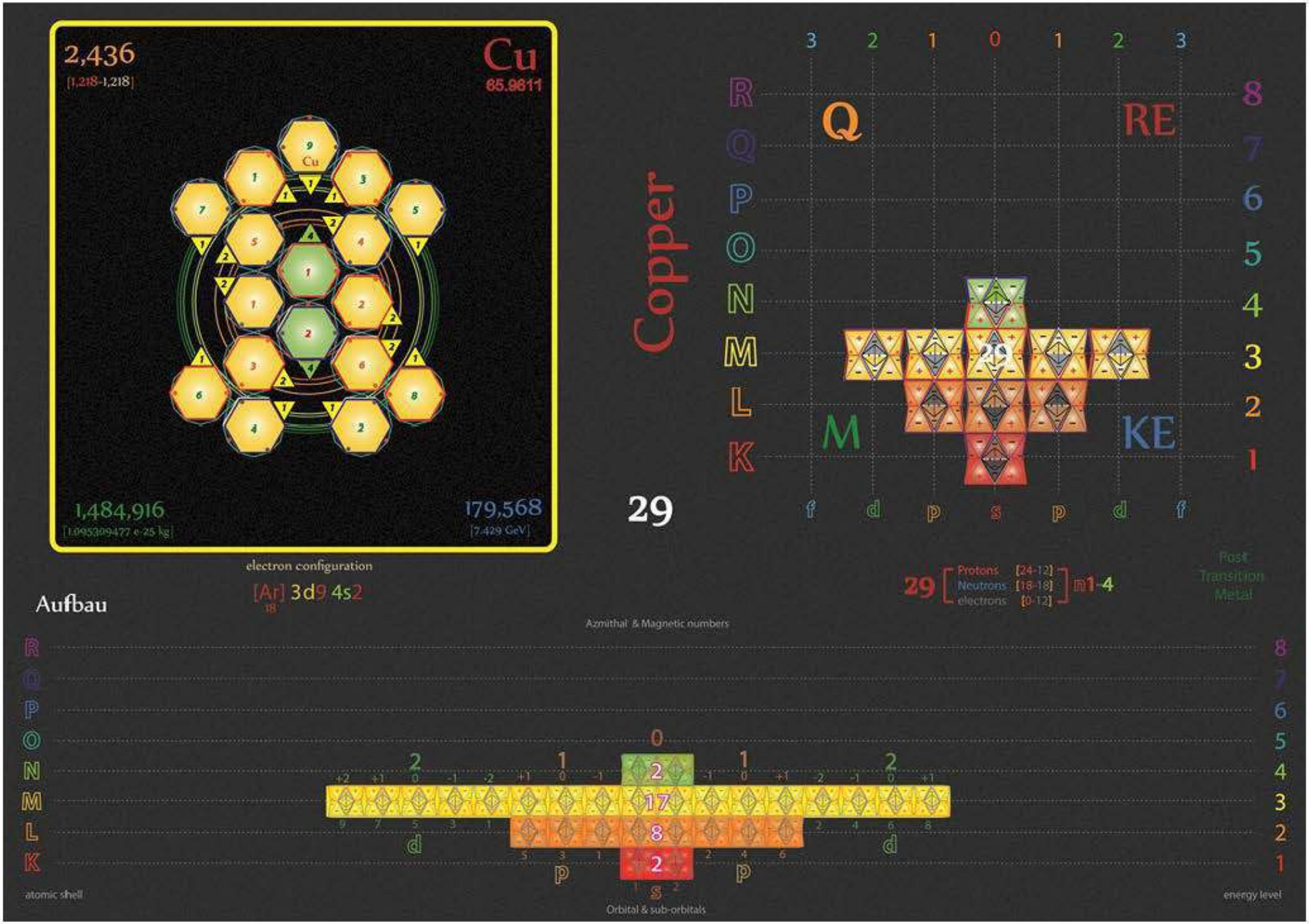

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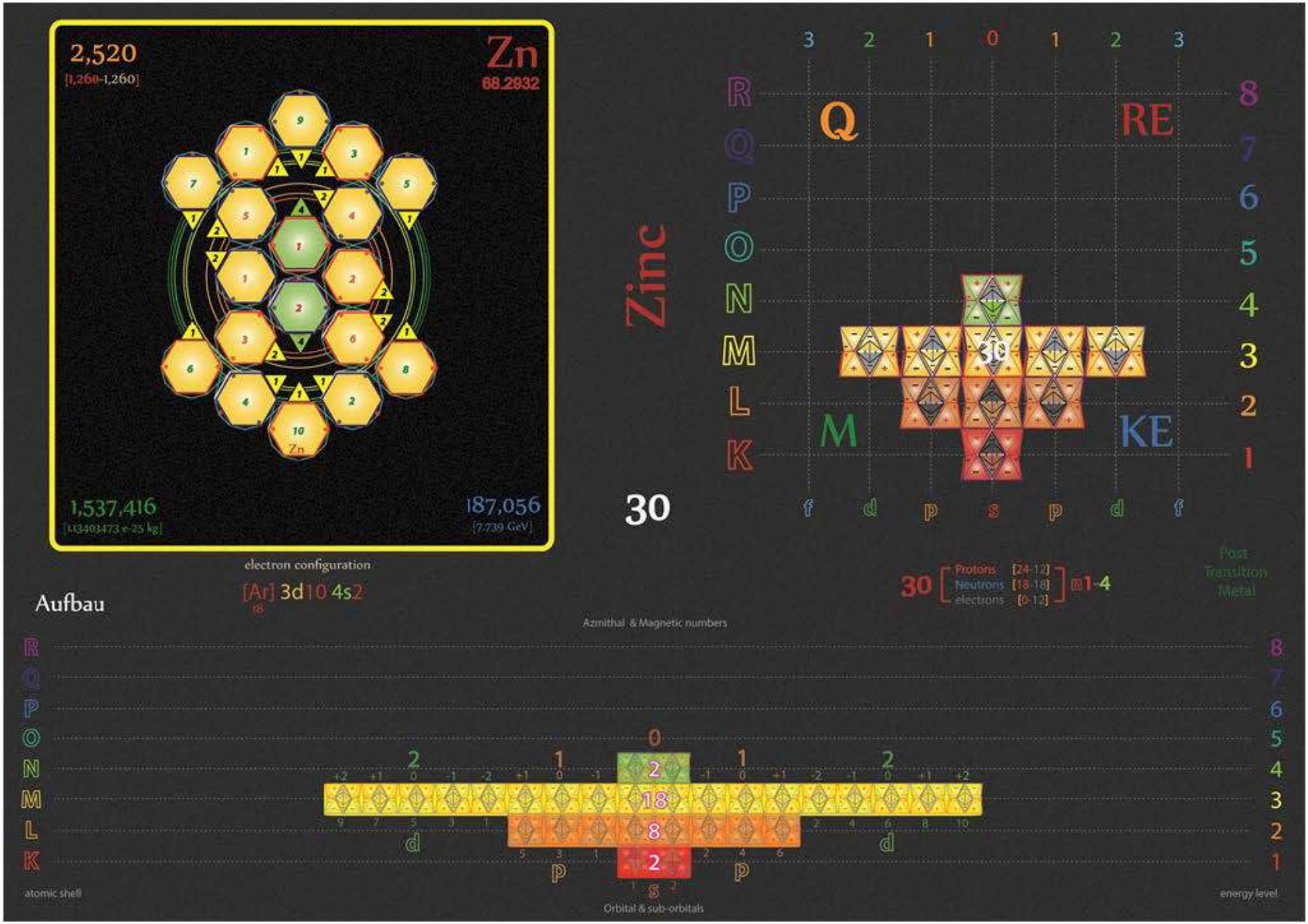

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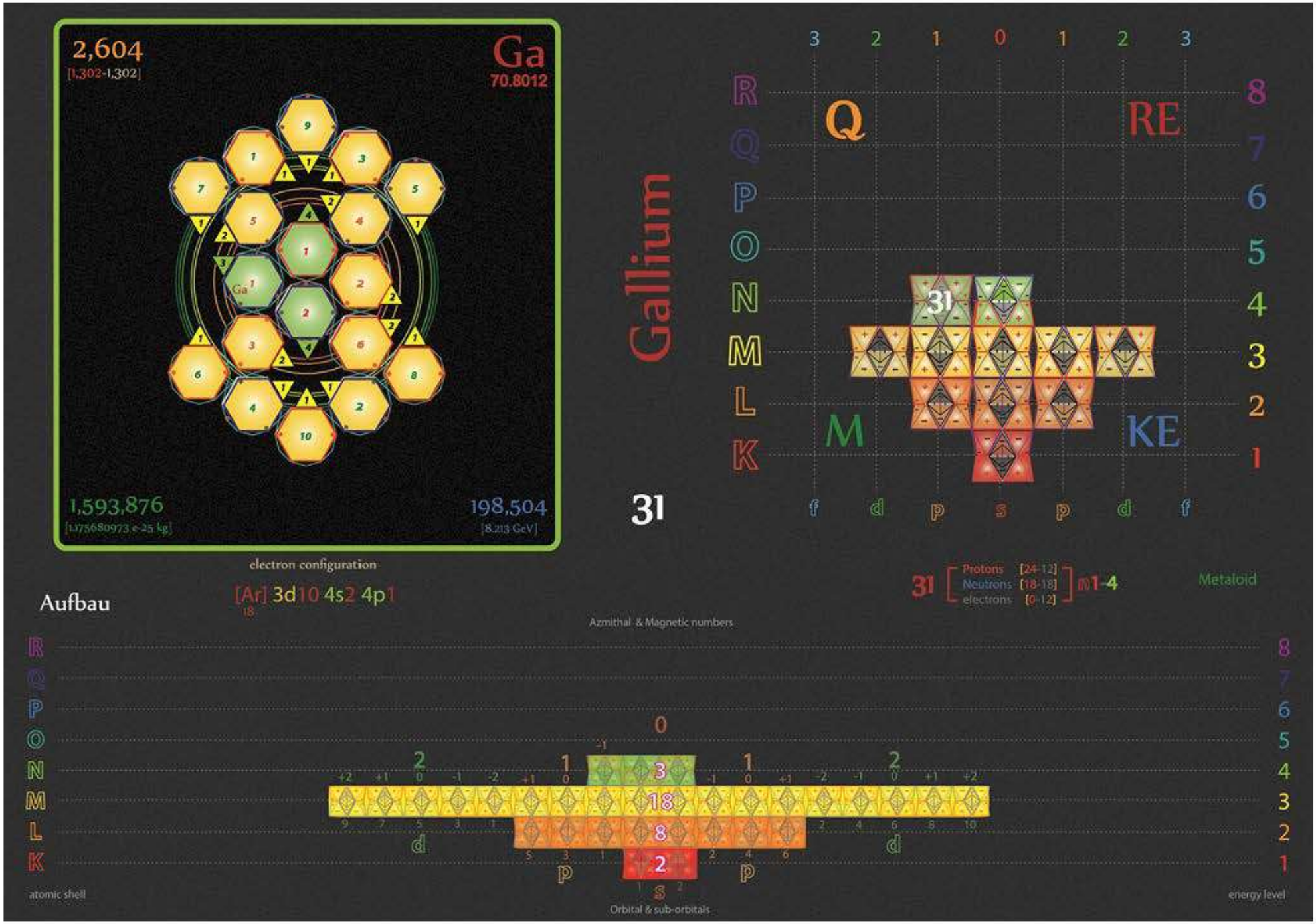

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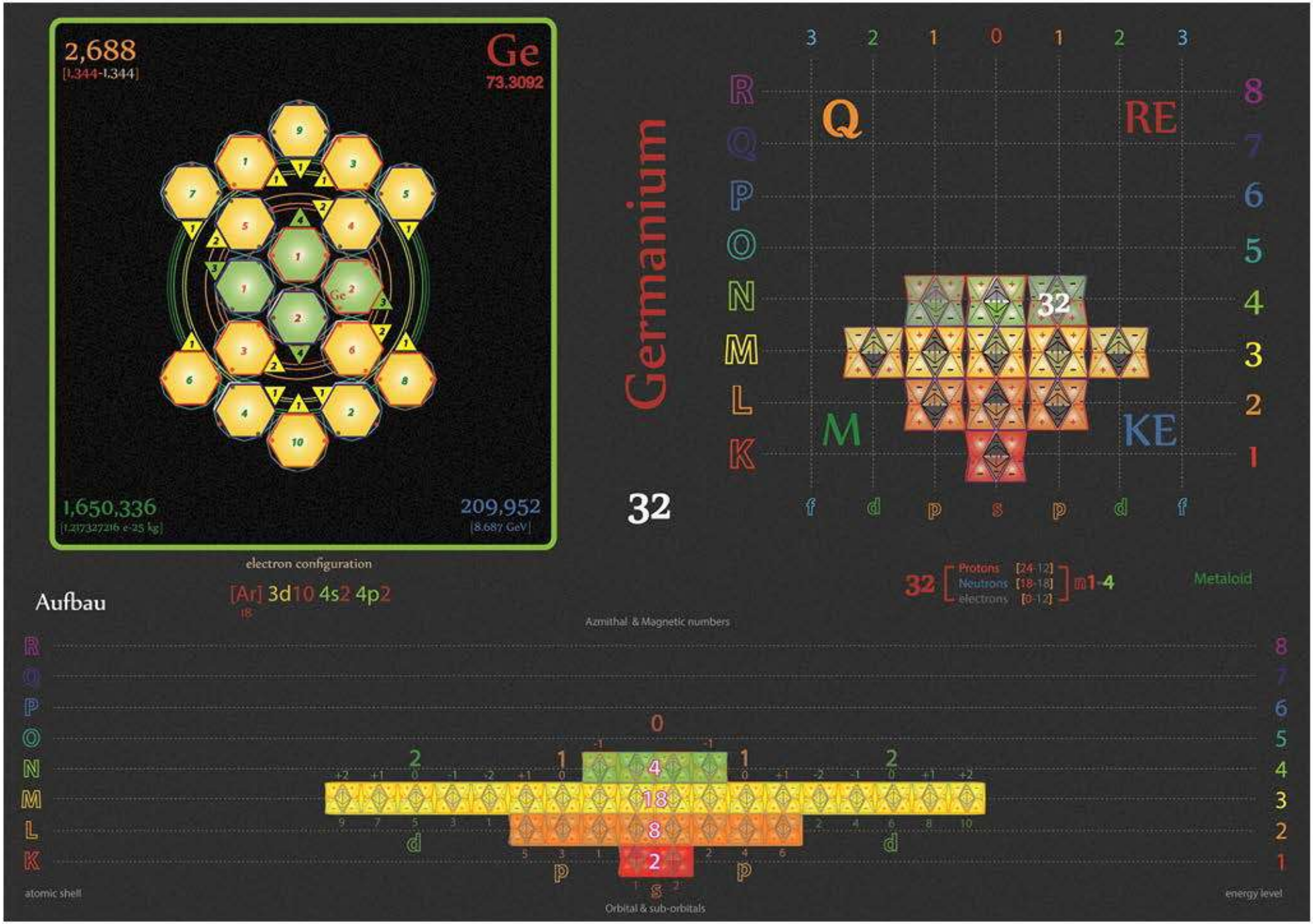

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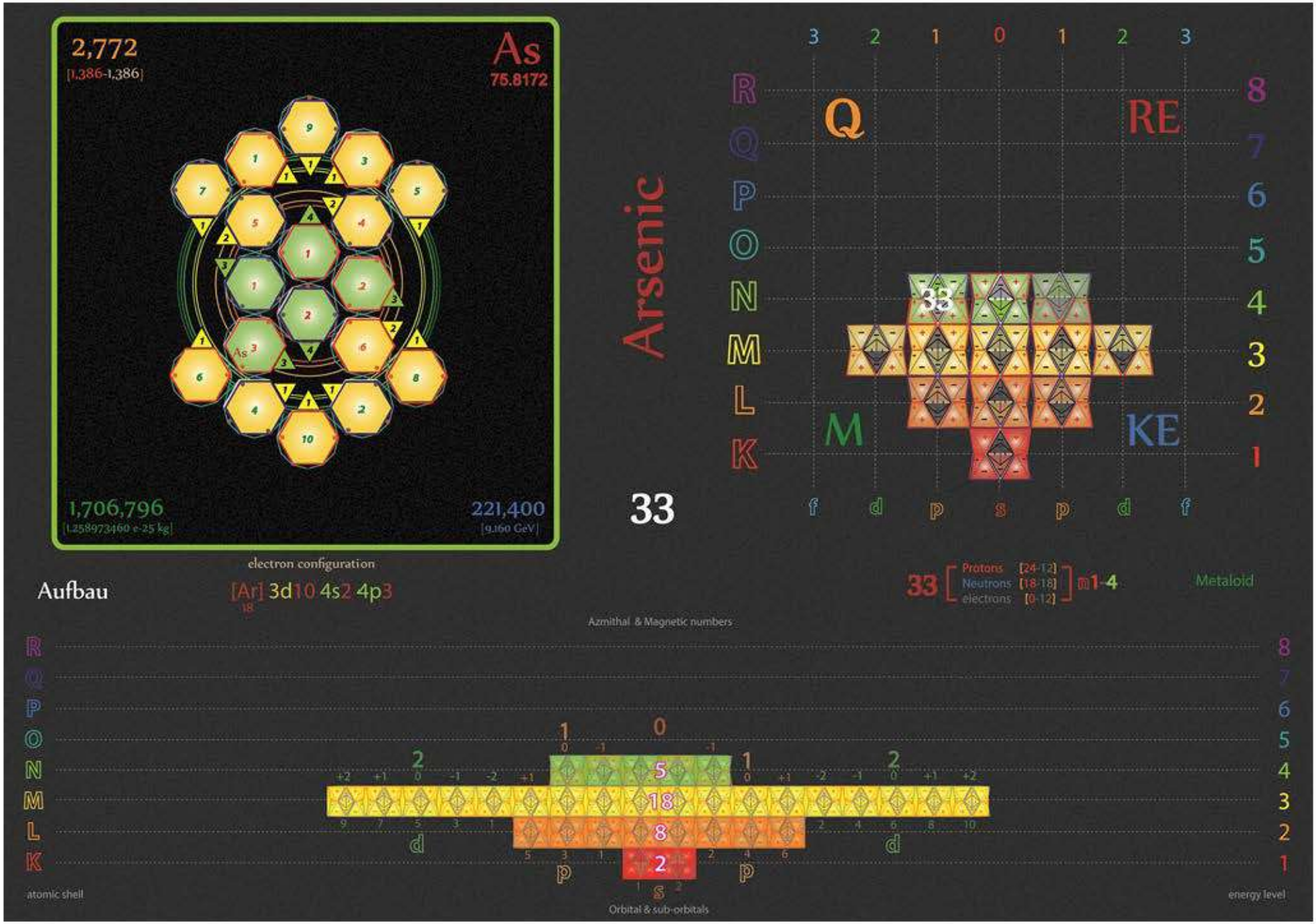

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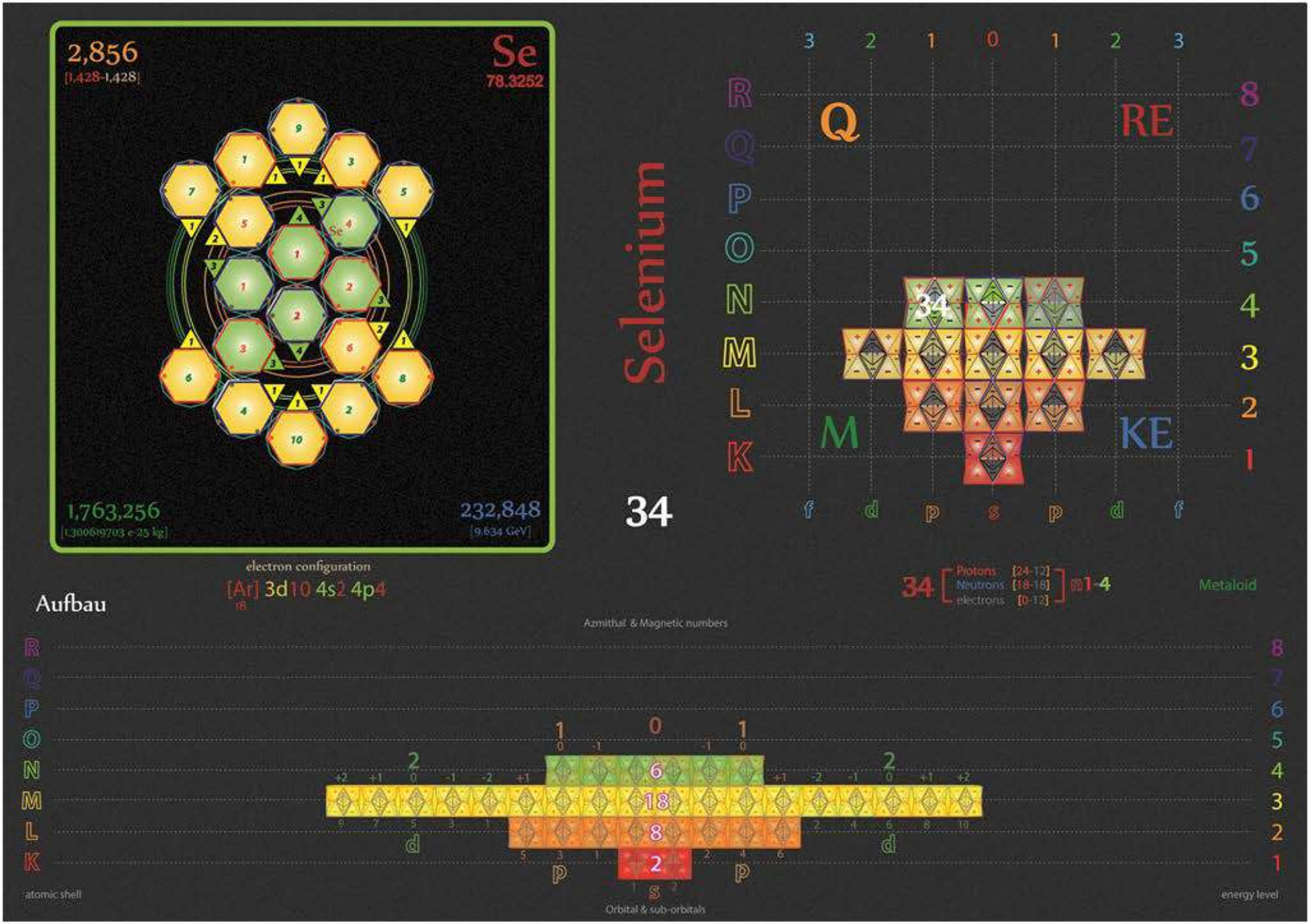

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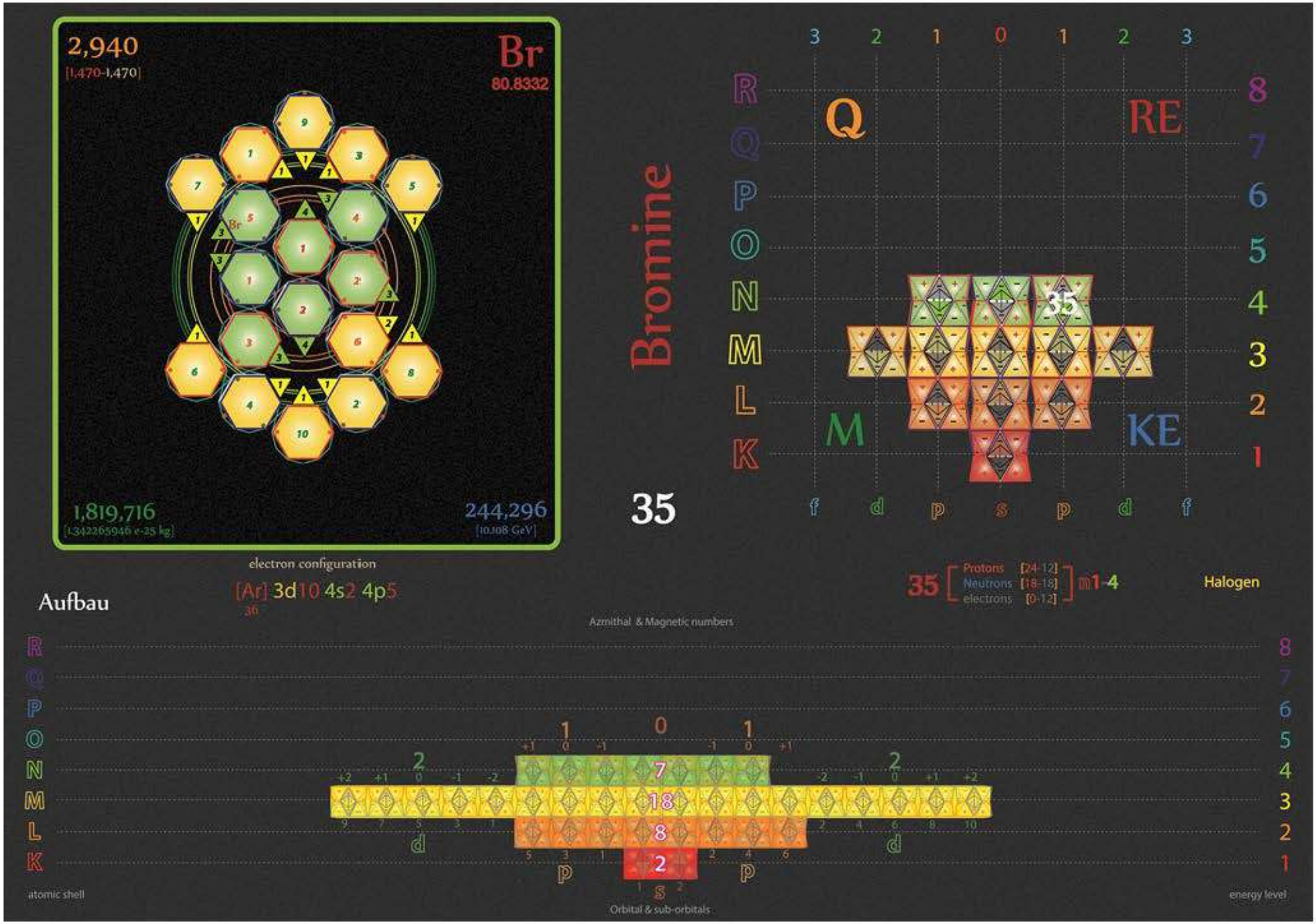

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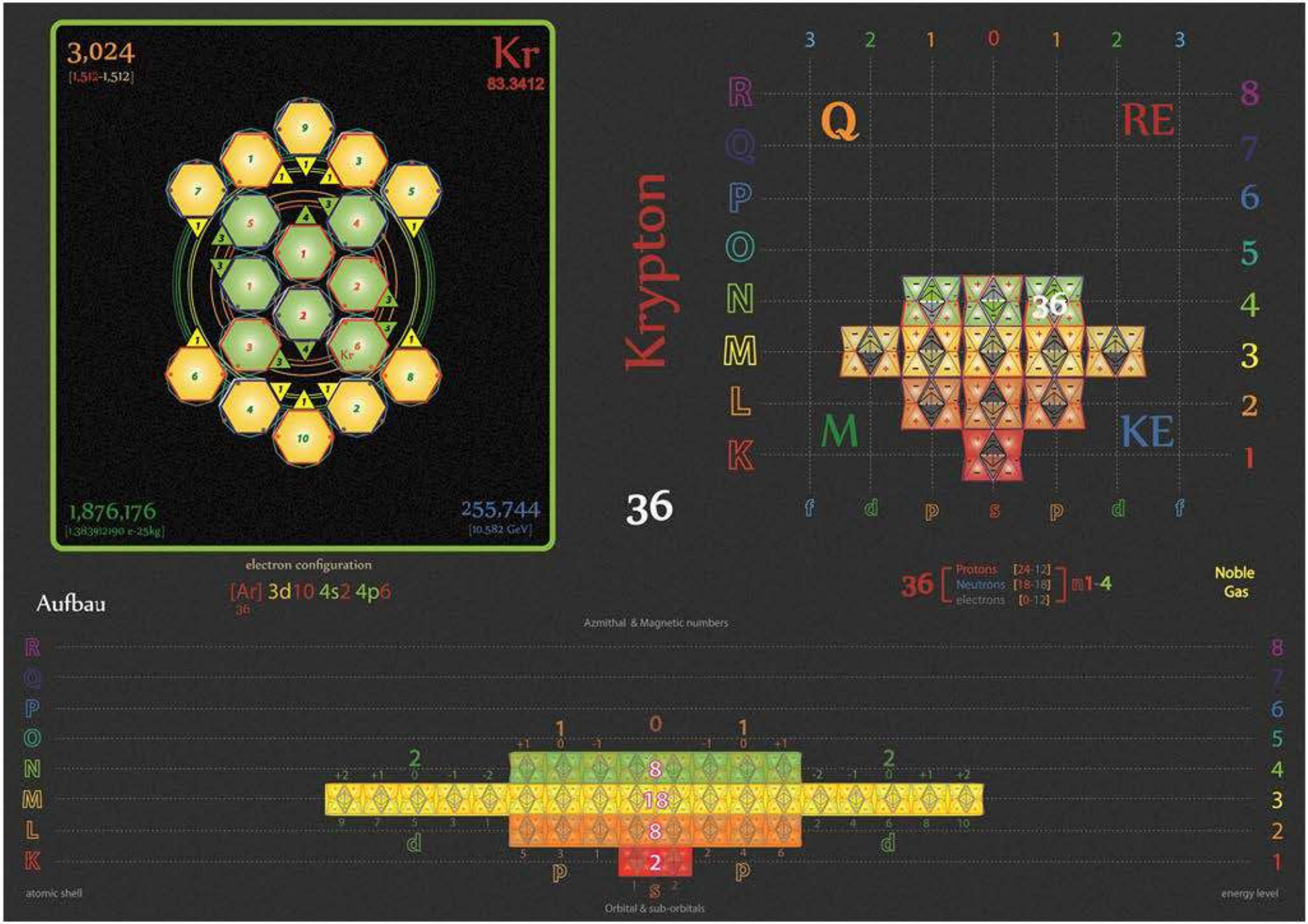

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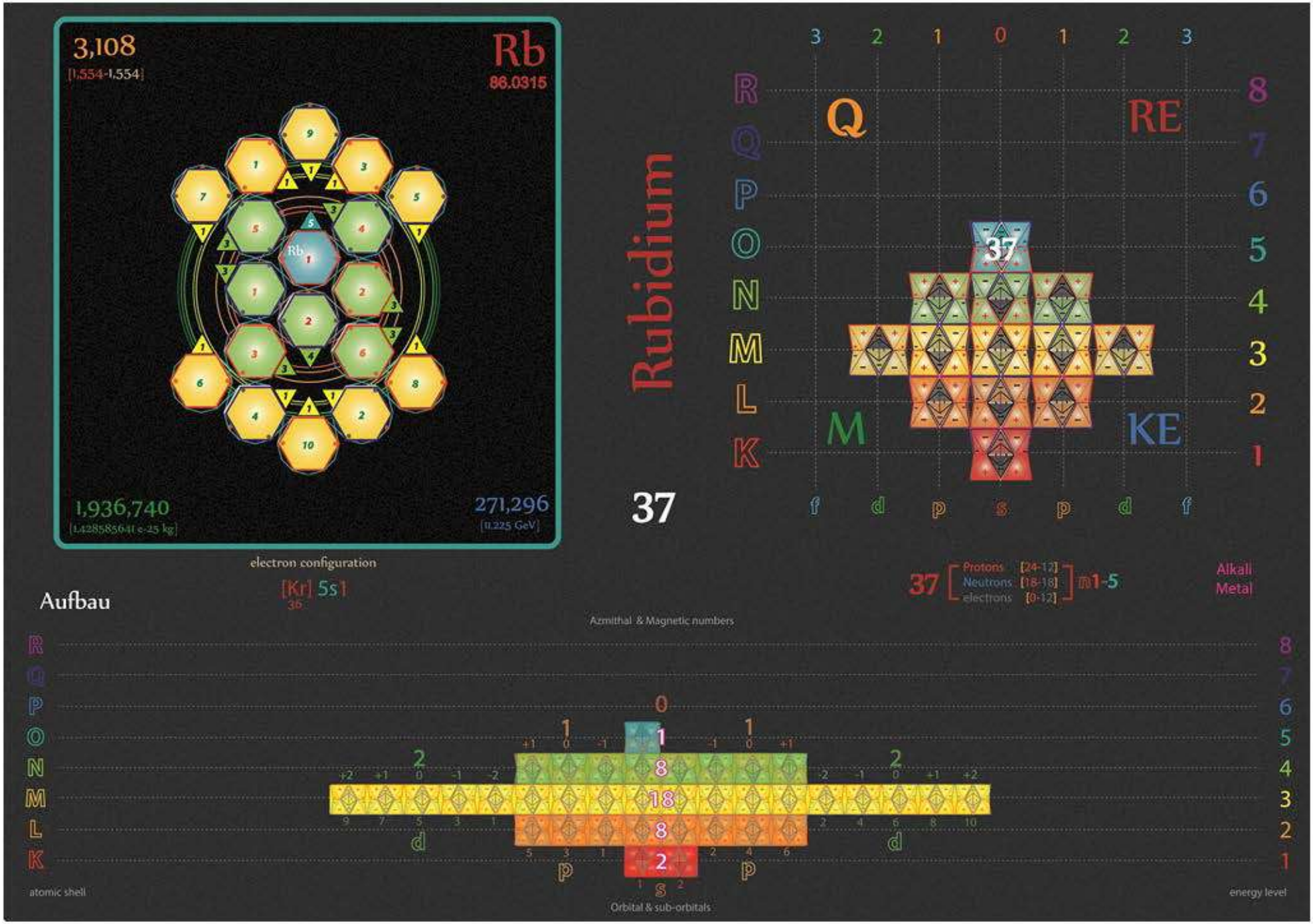

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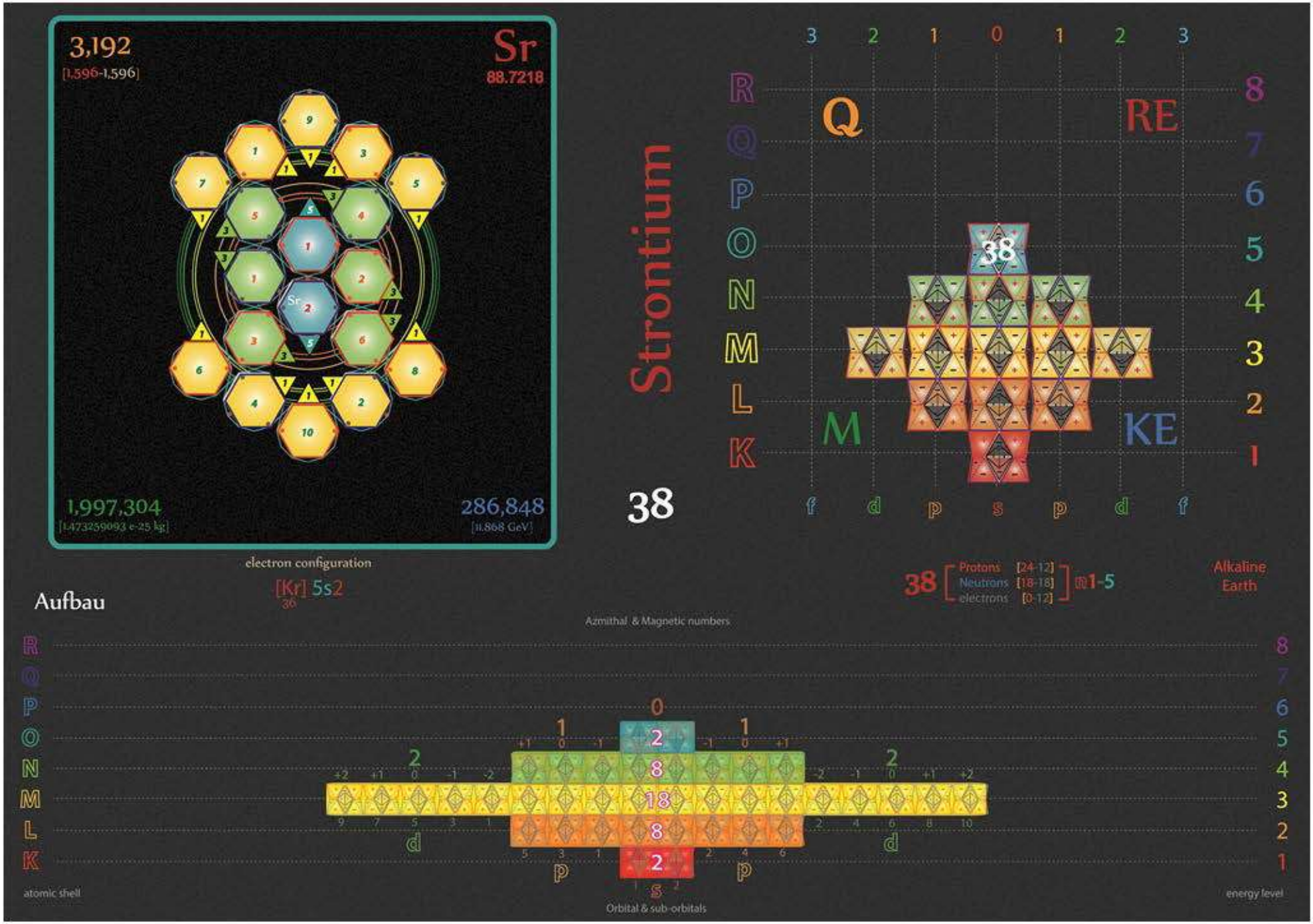

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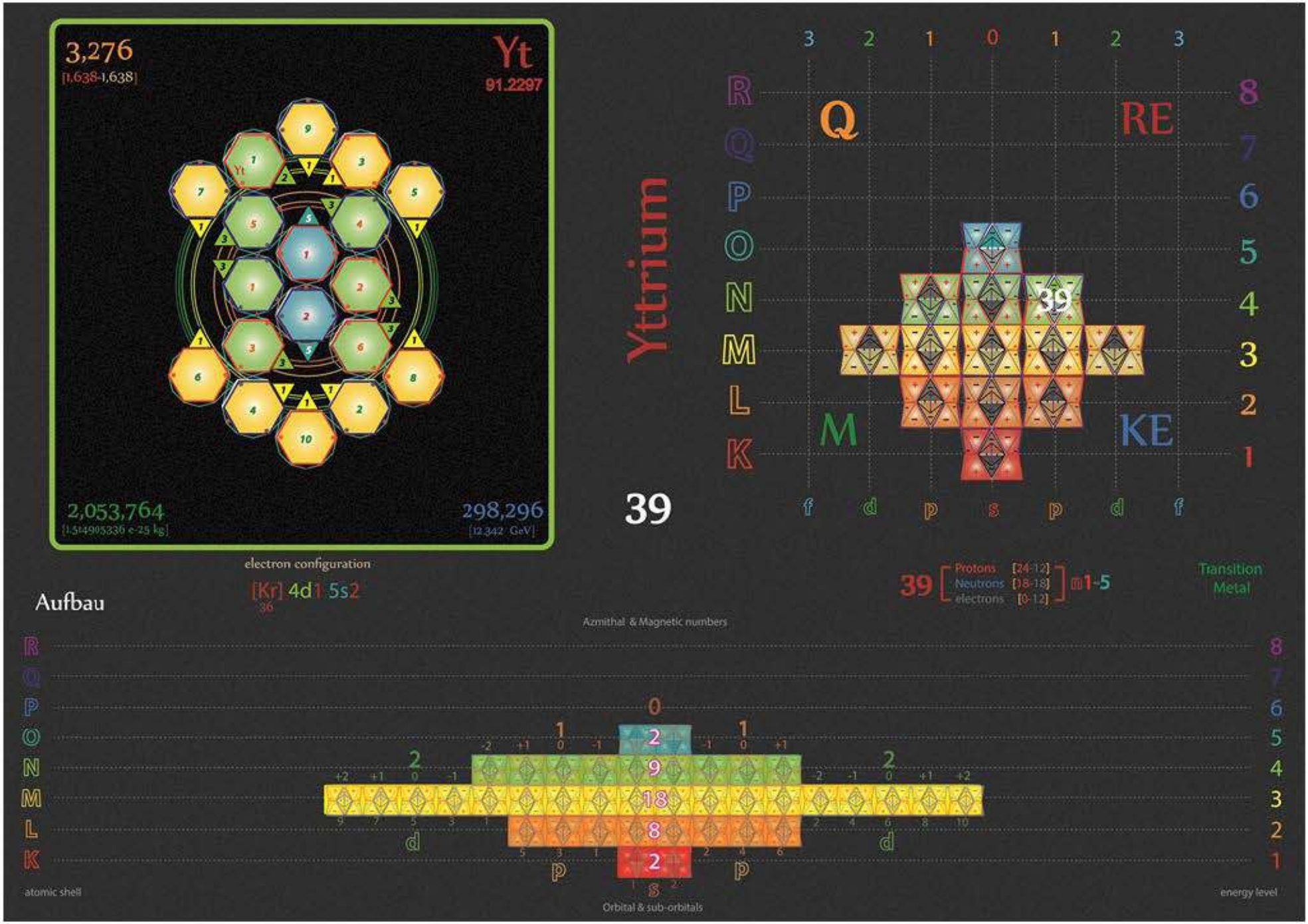

Tetryonics 51.39 - Yttrium atom

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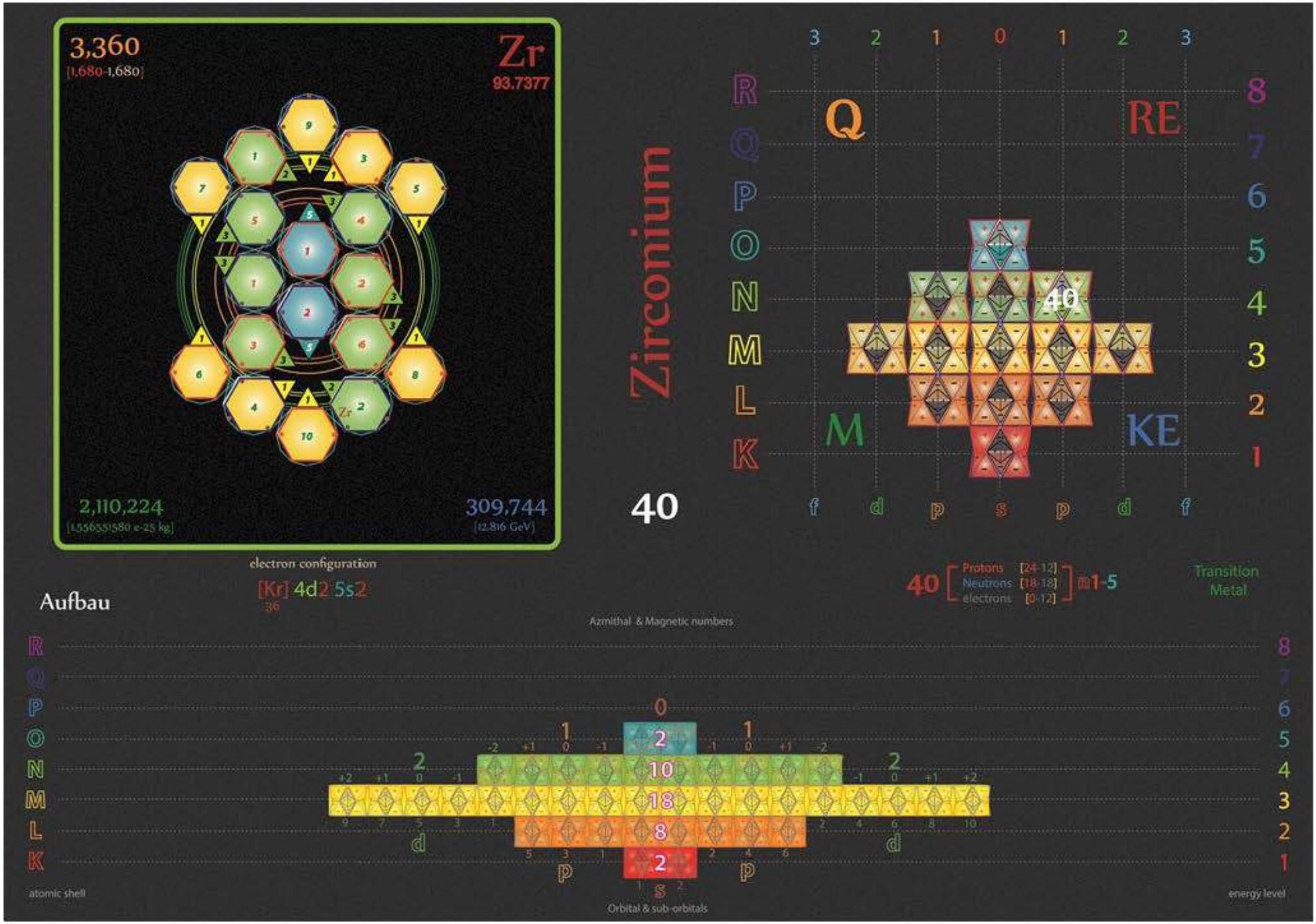

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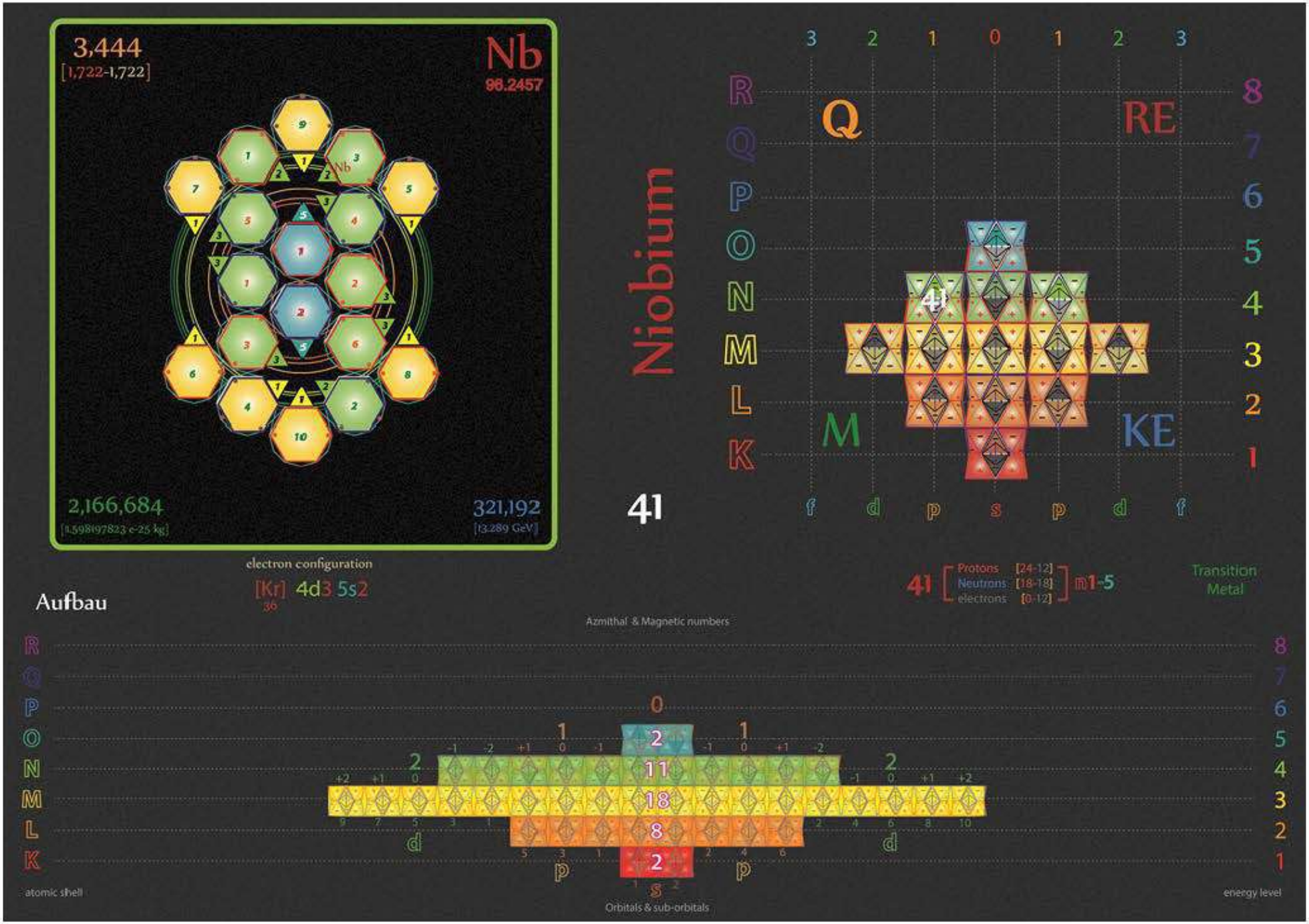

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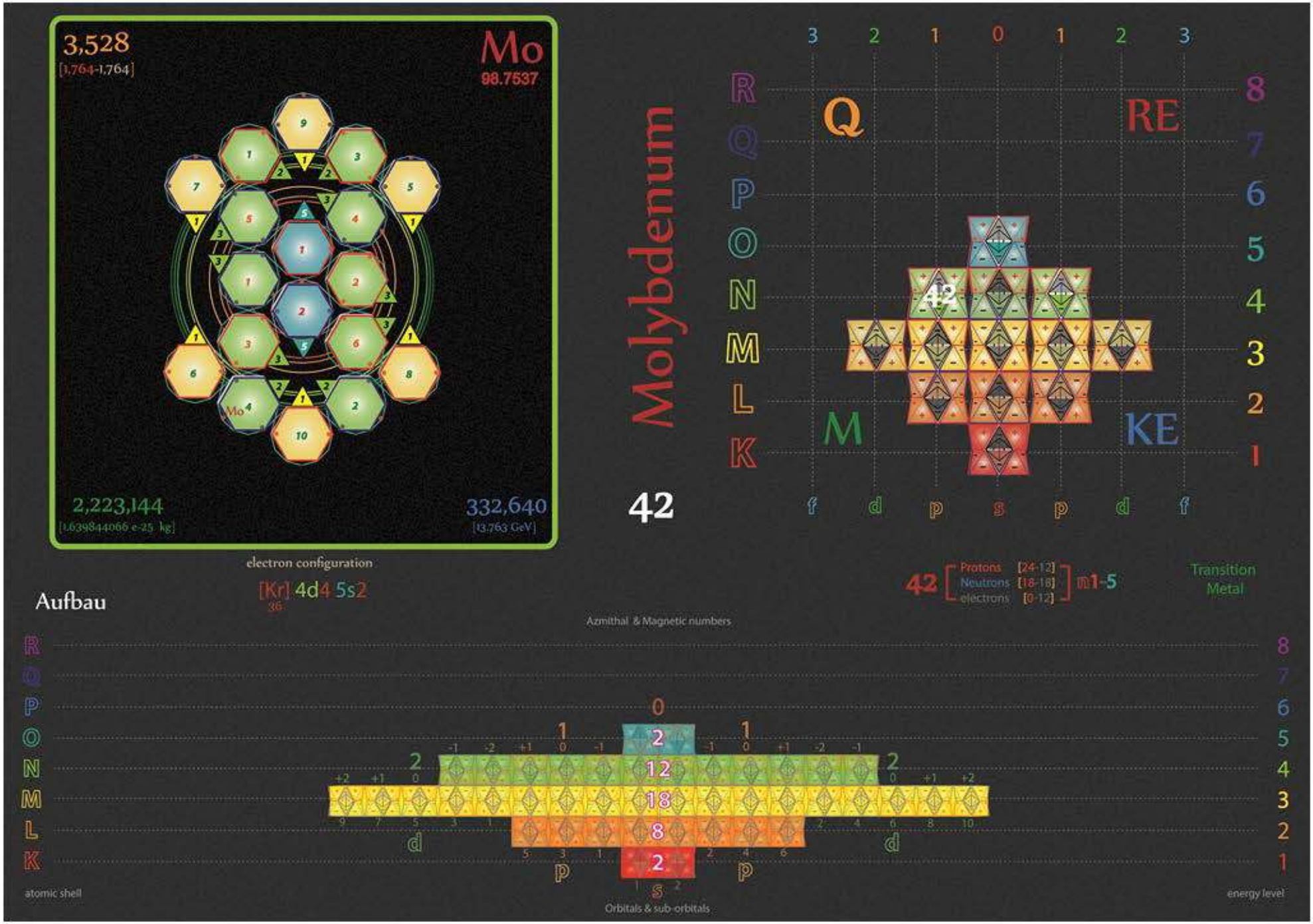

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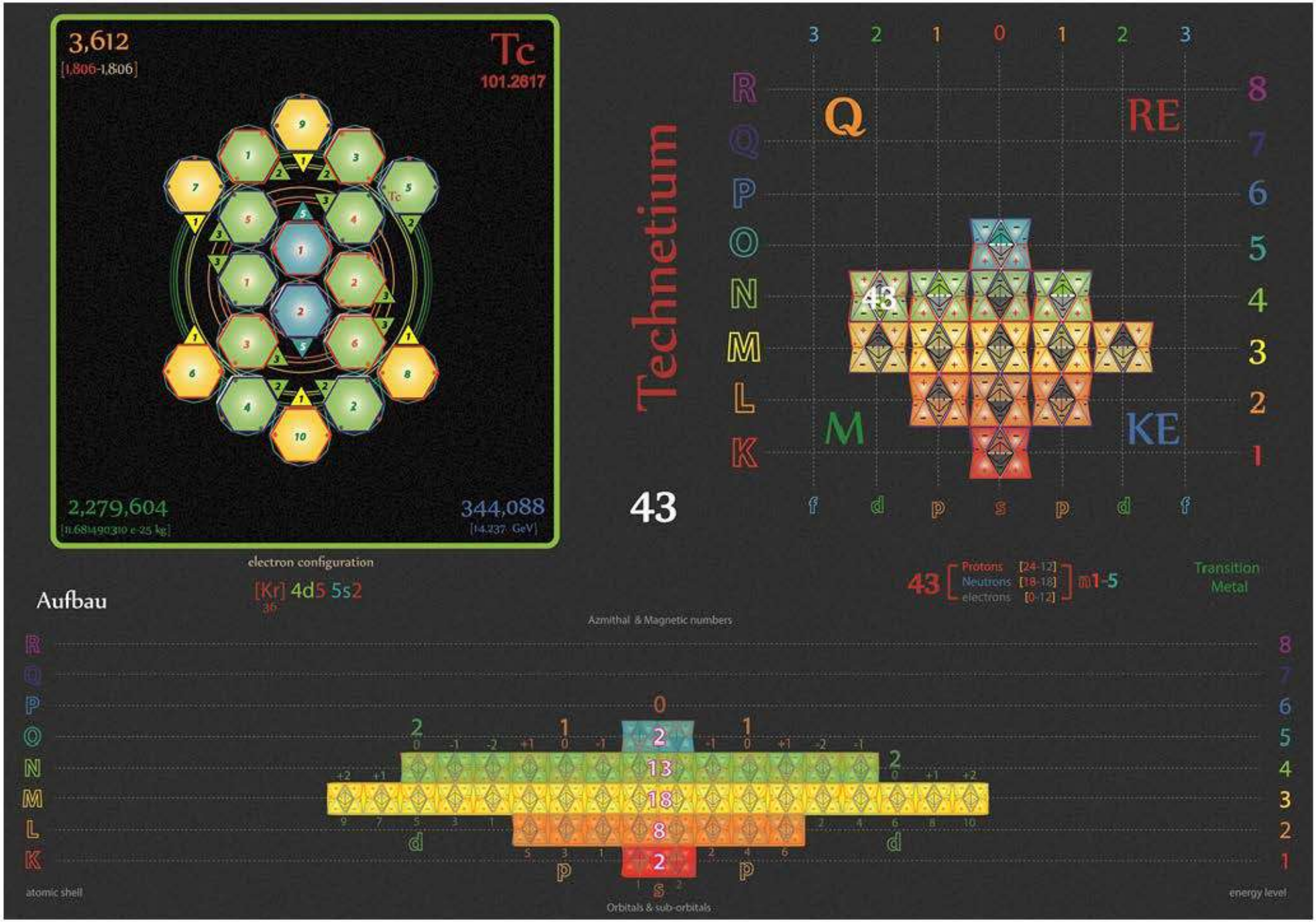

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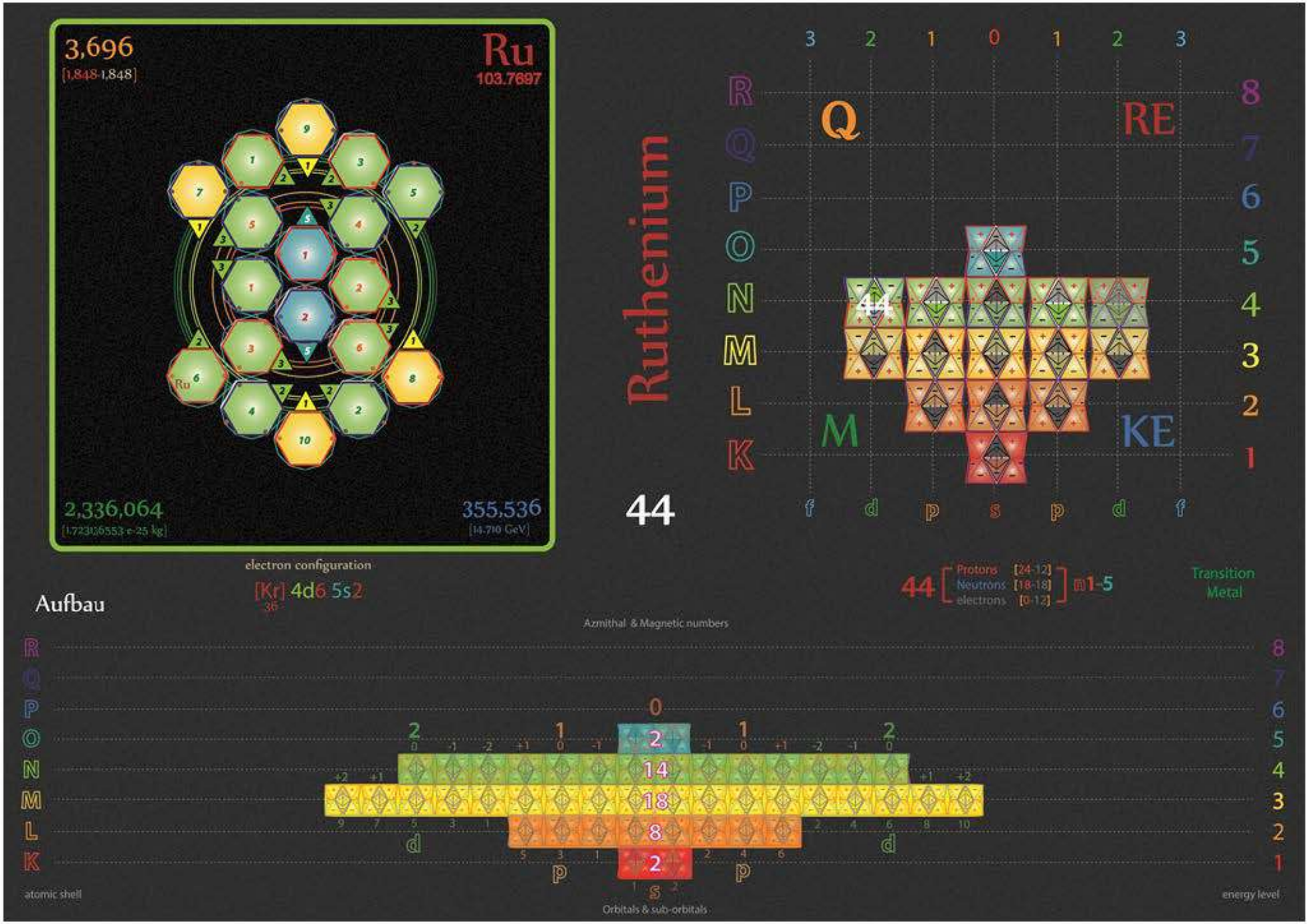

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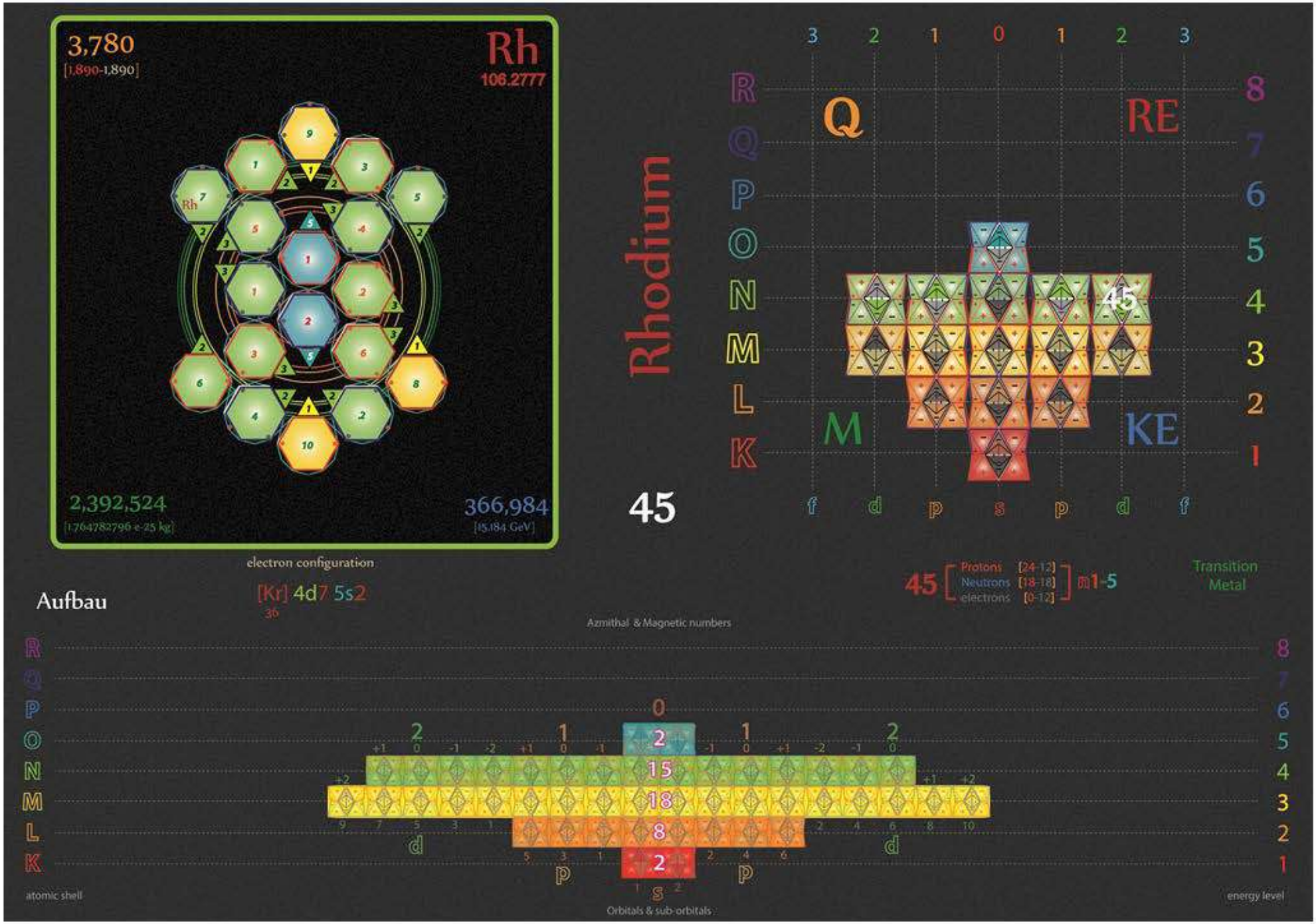

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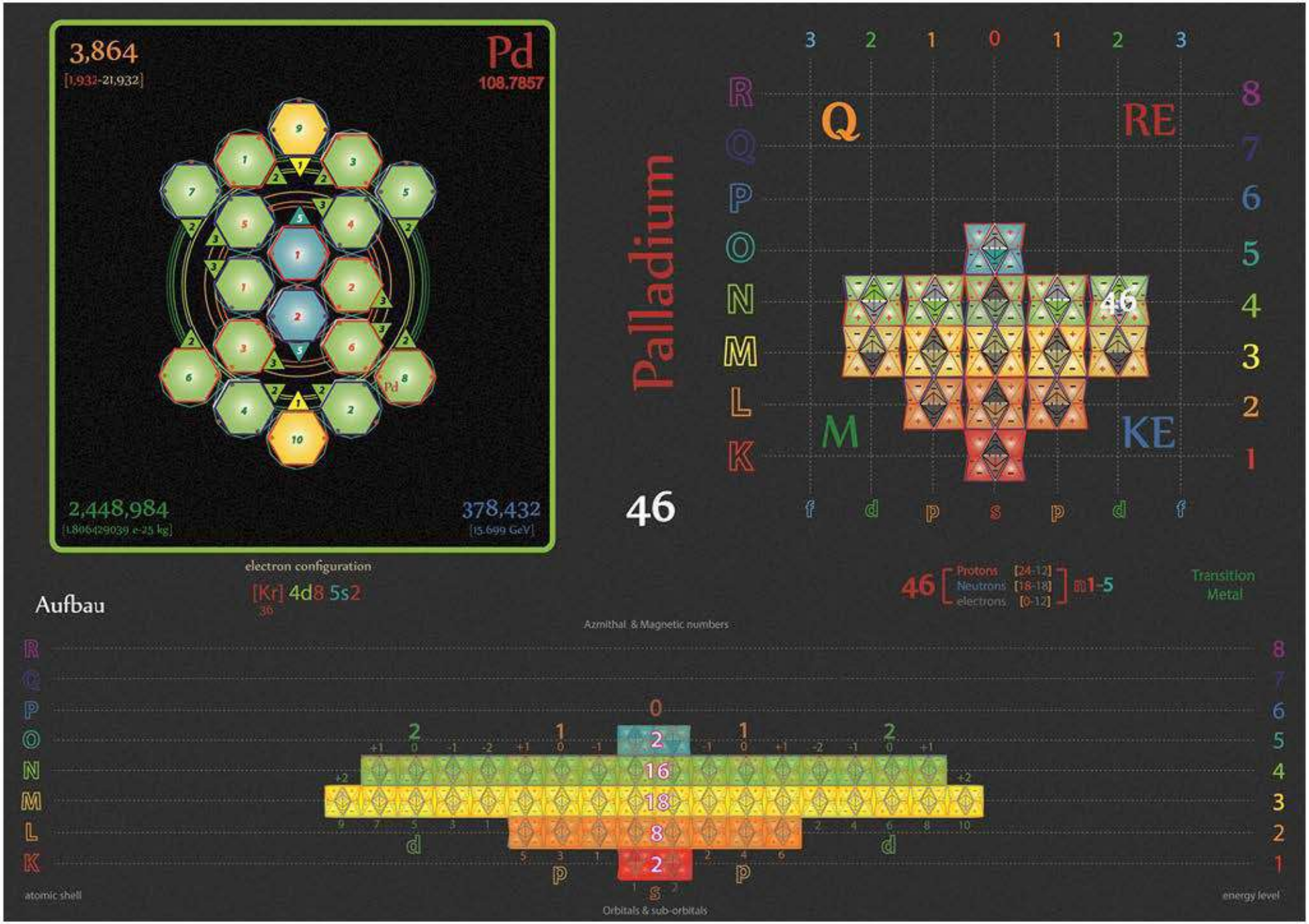

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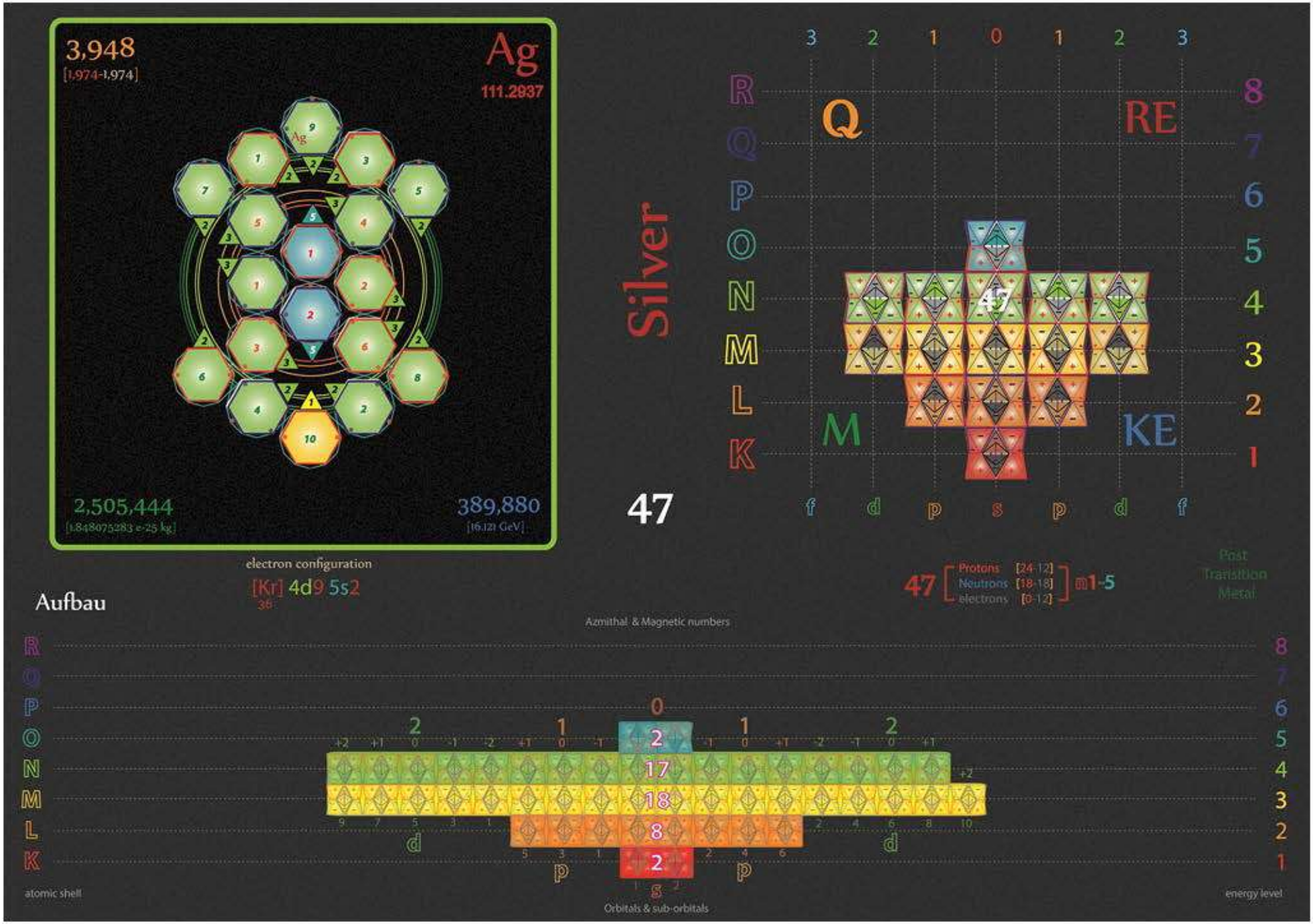

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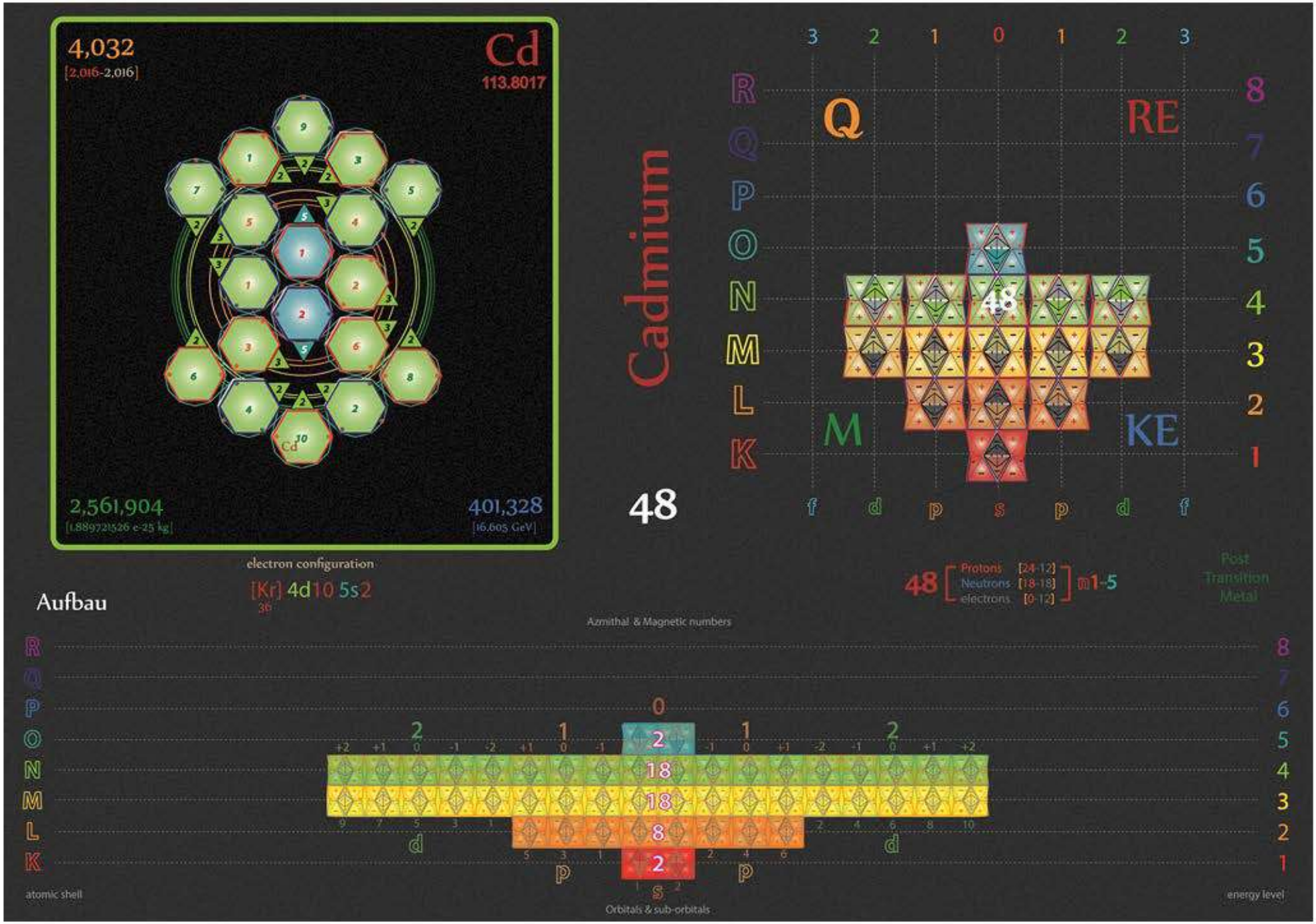

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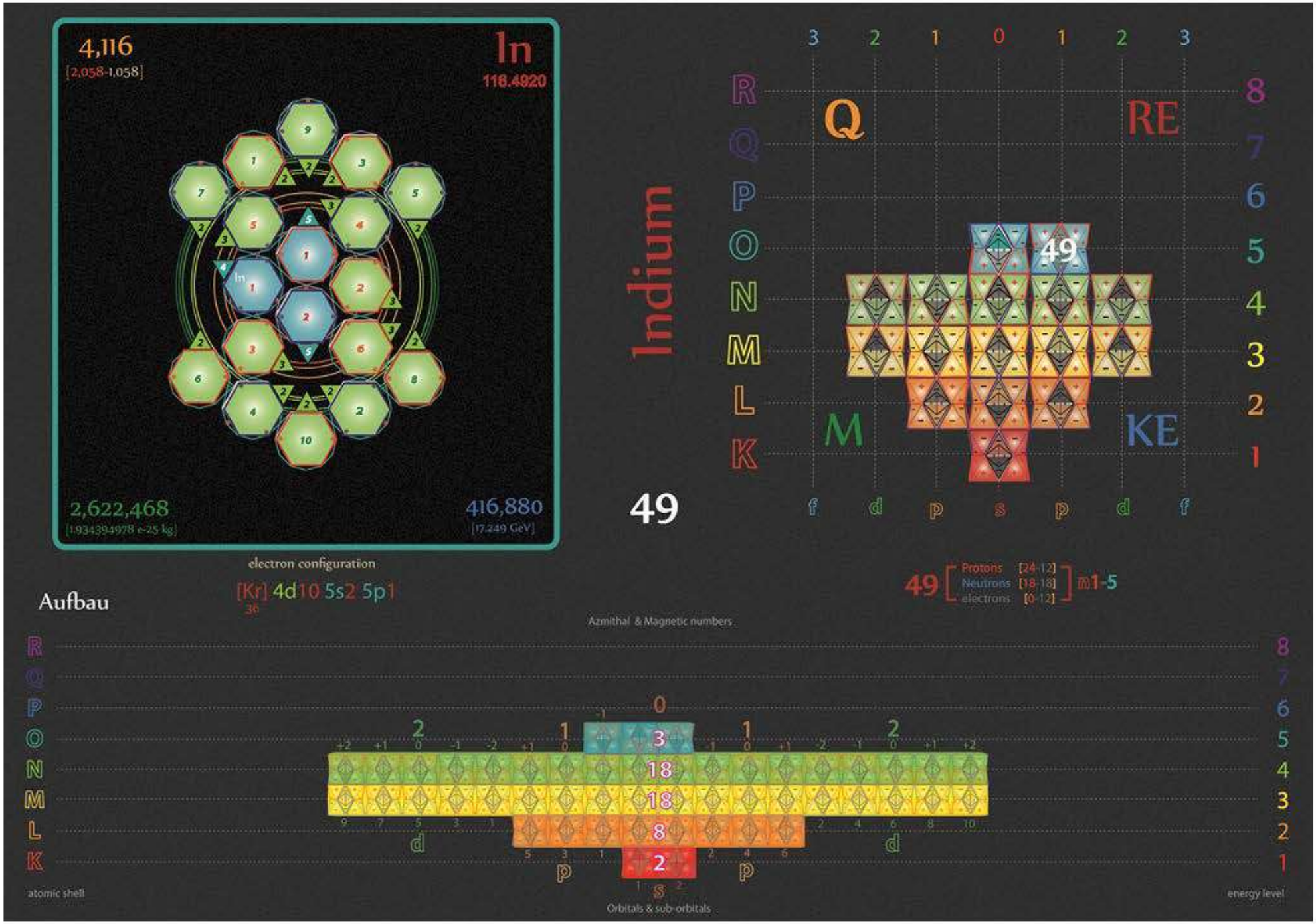

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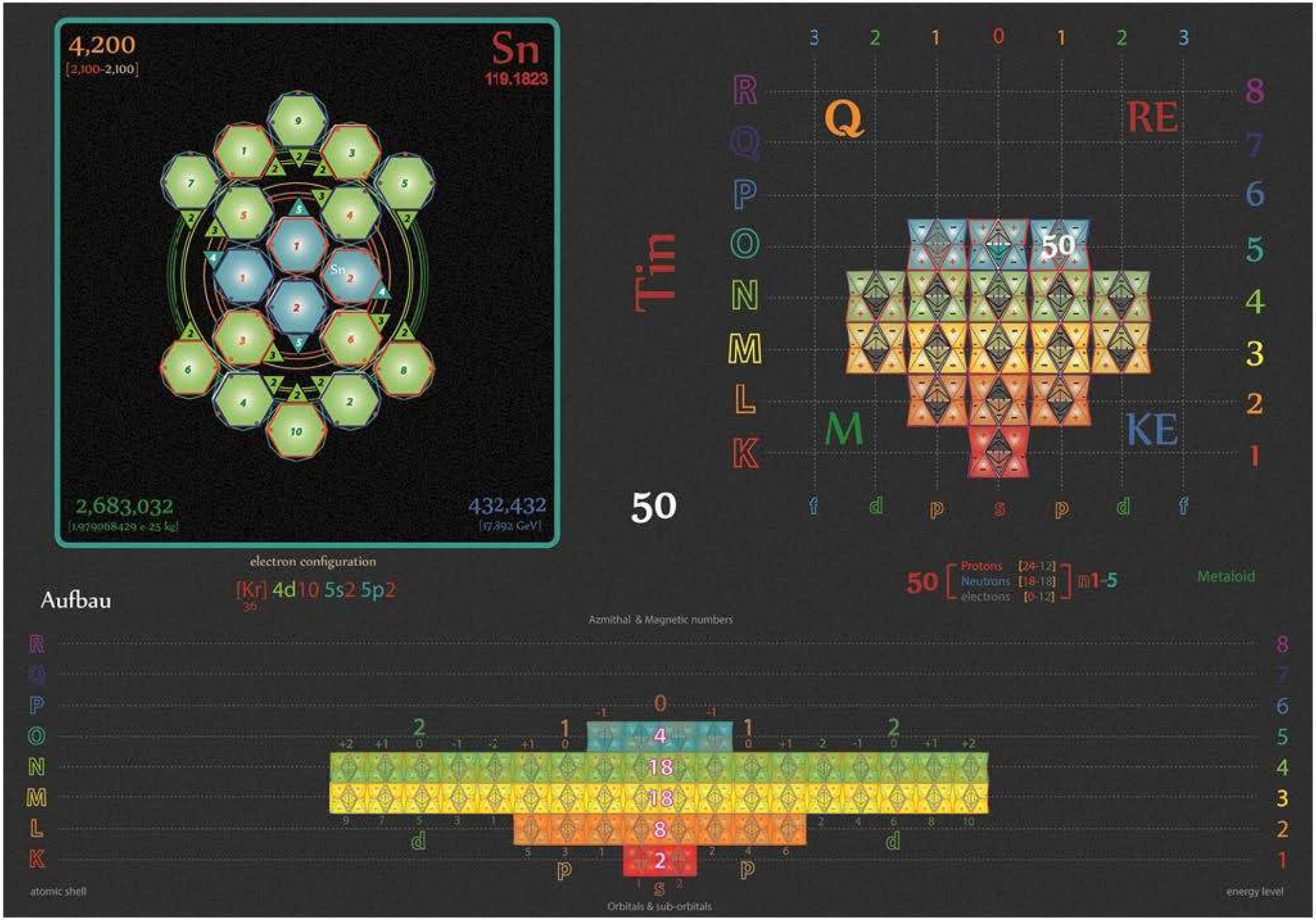

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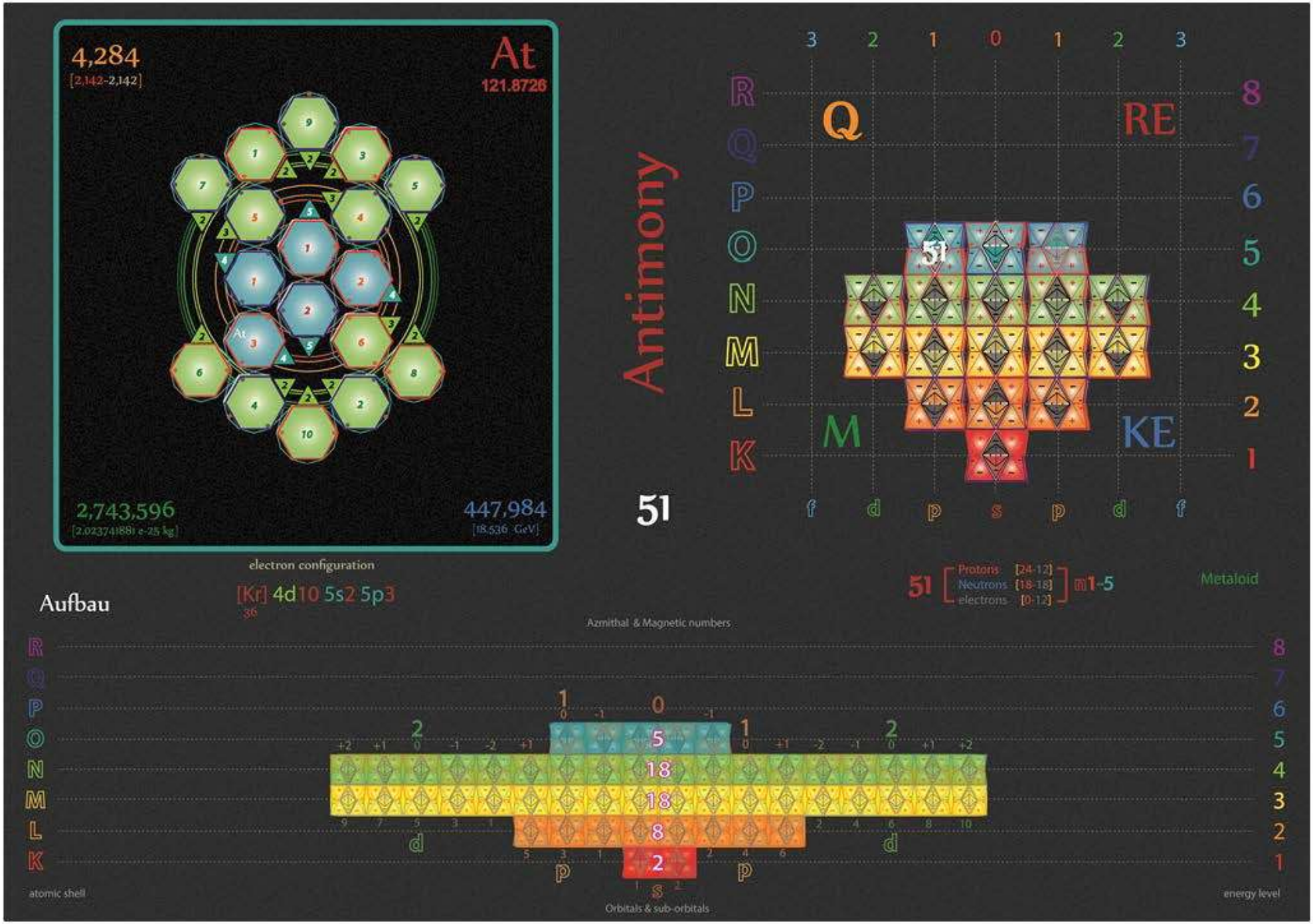

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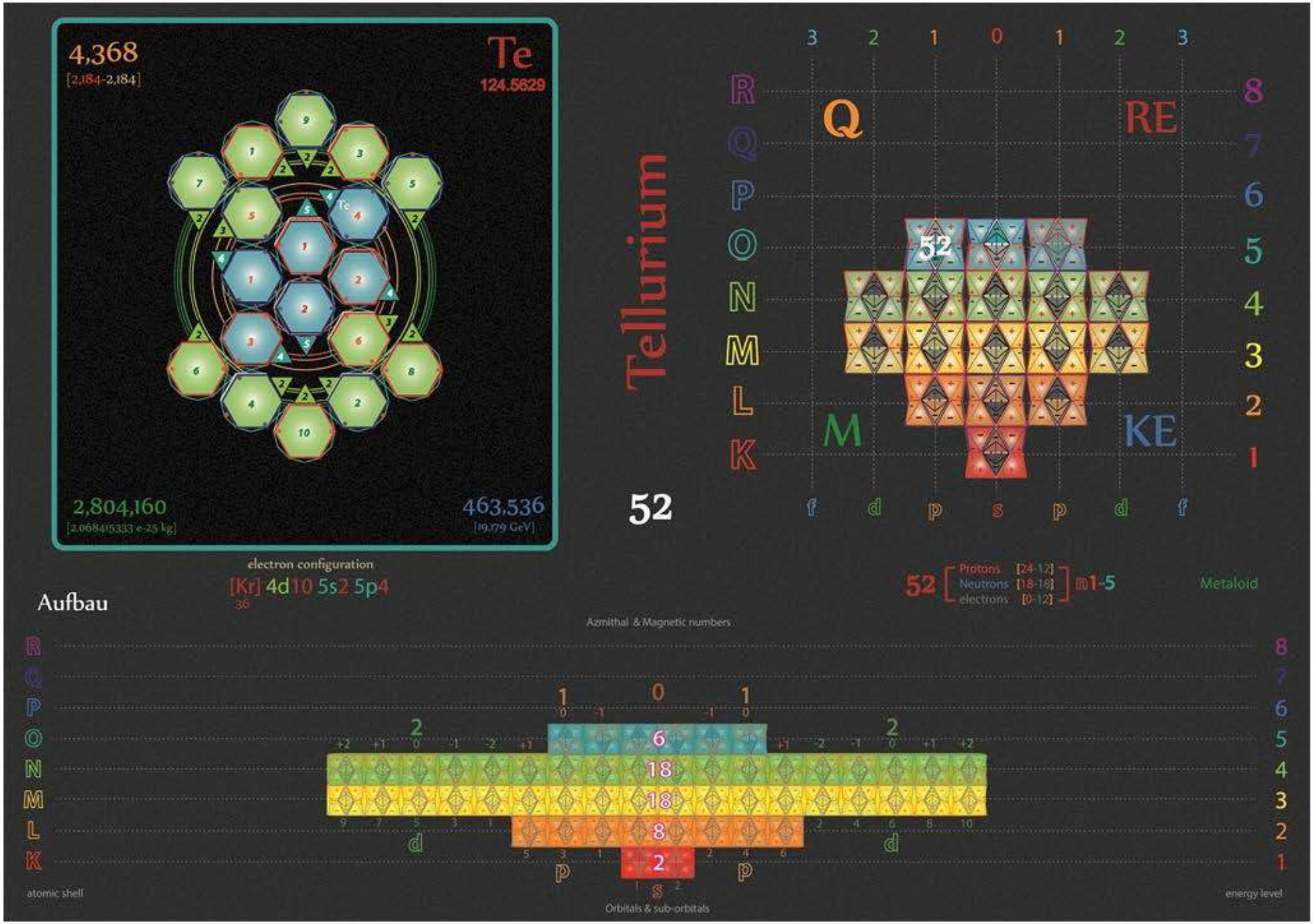

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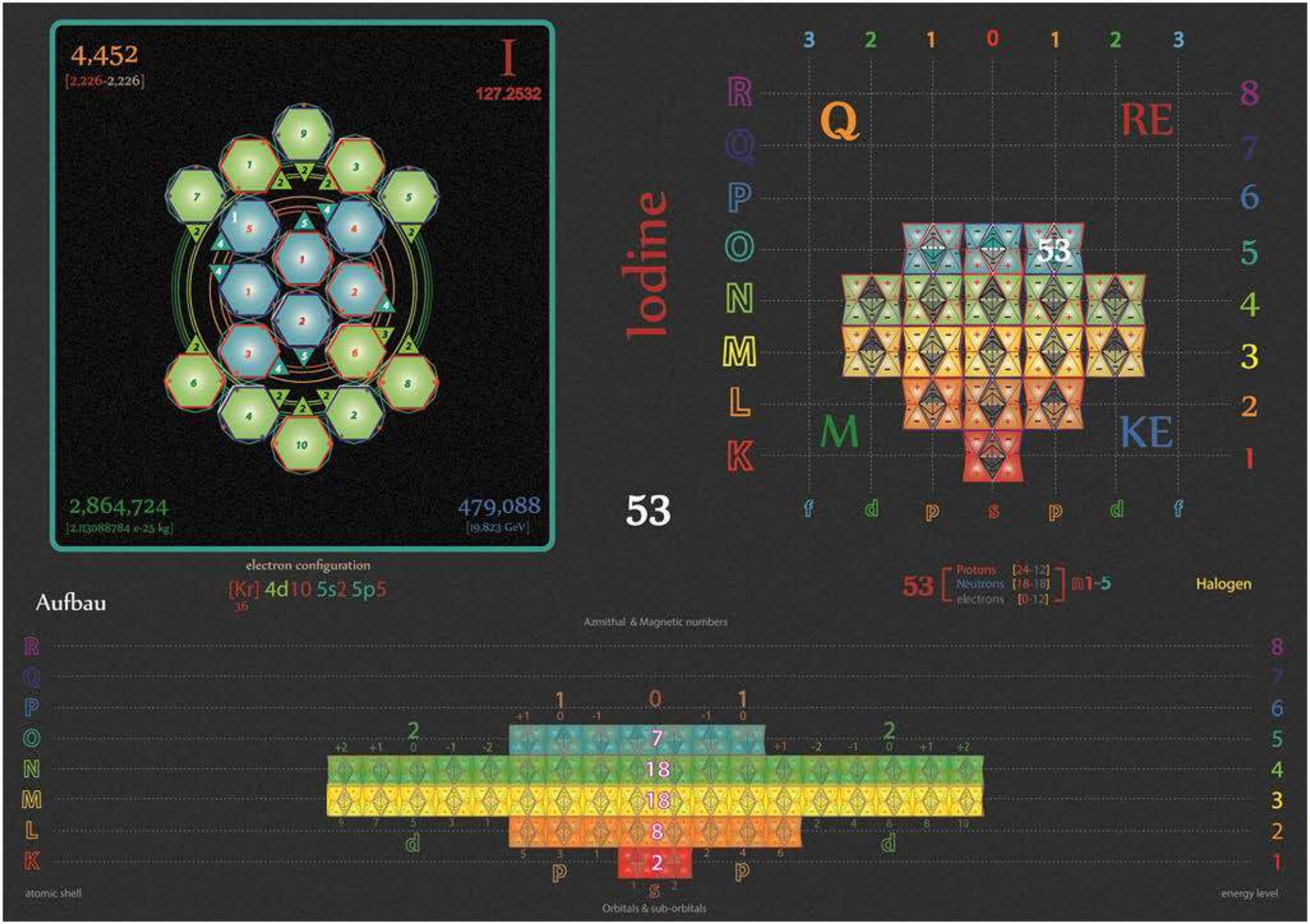

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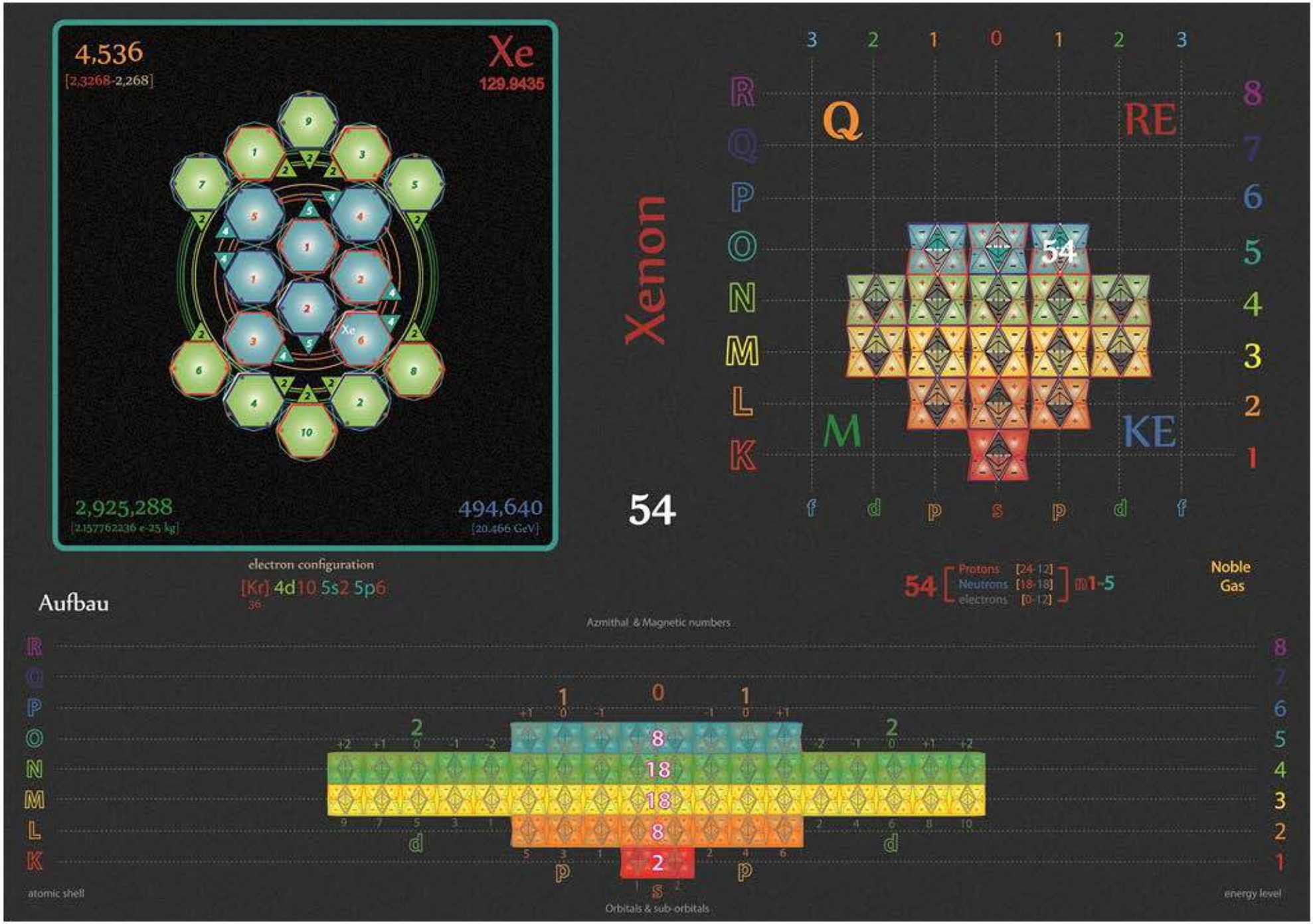

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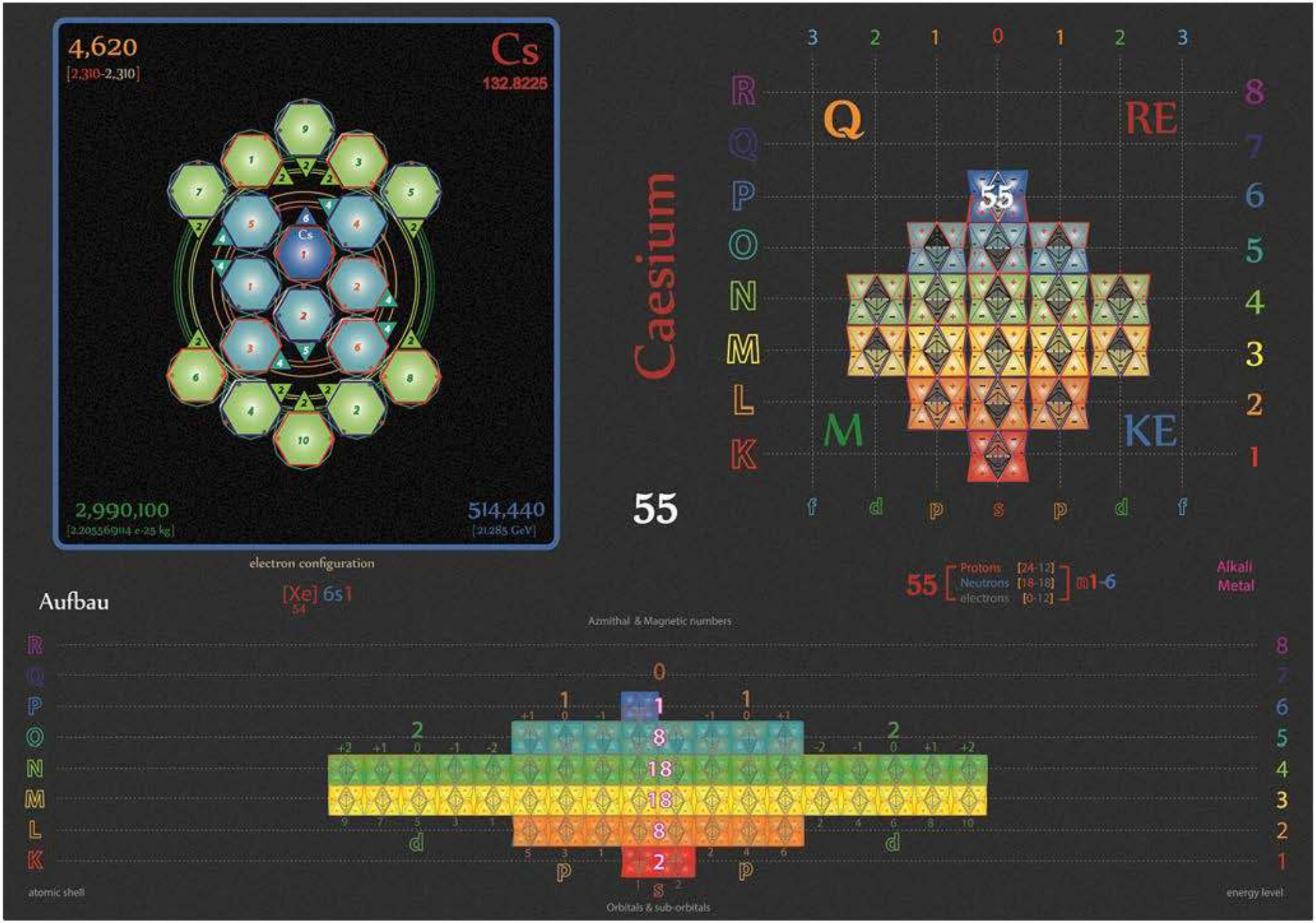

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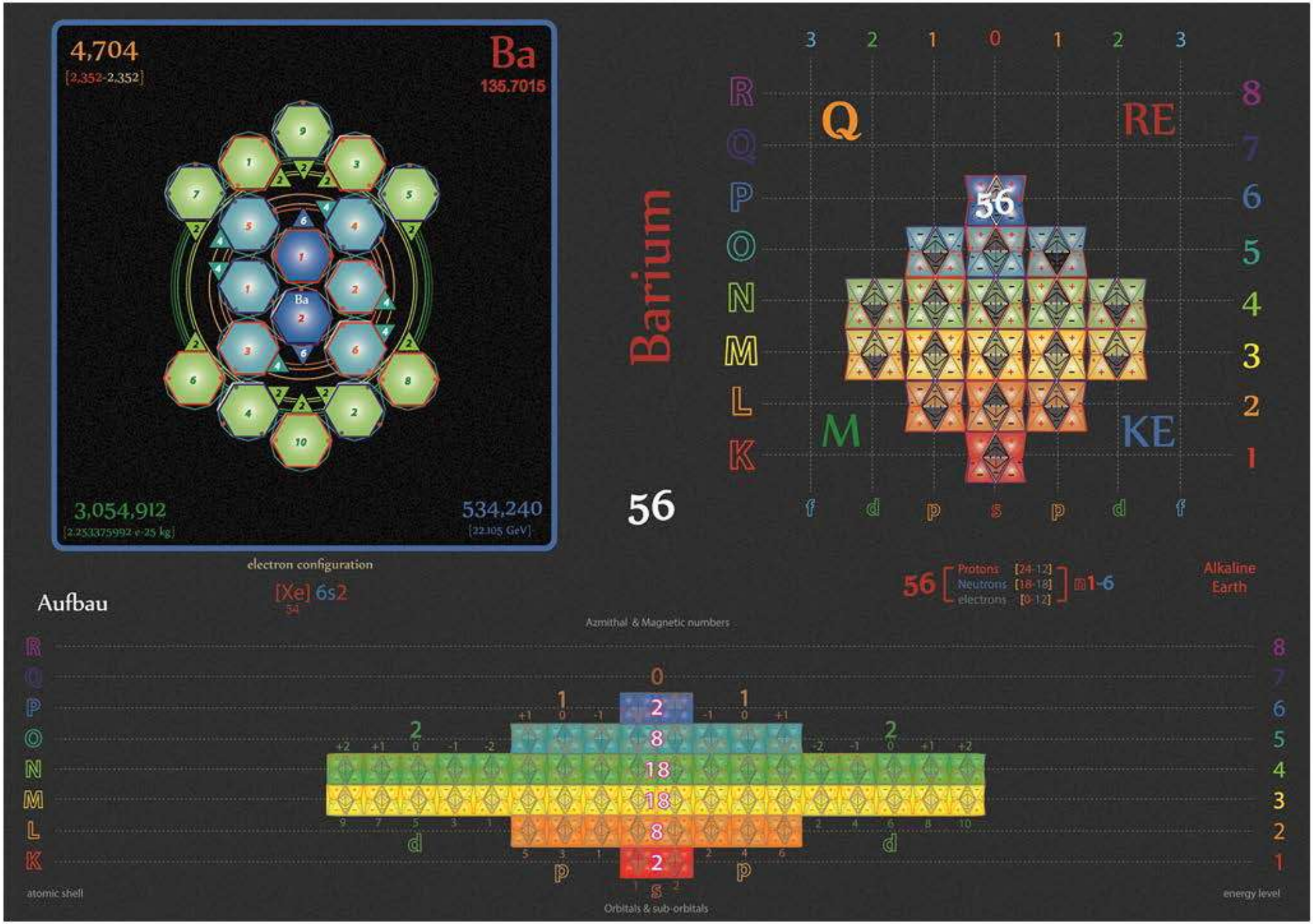

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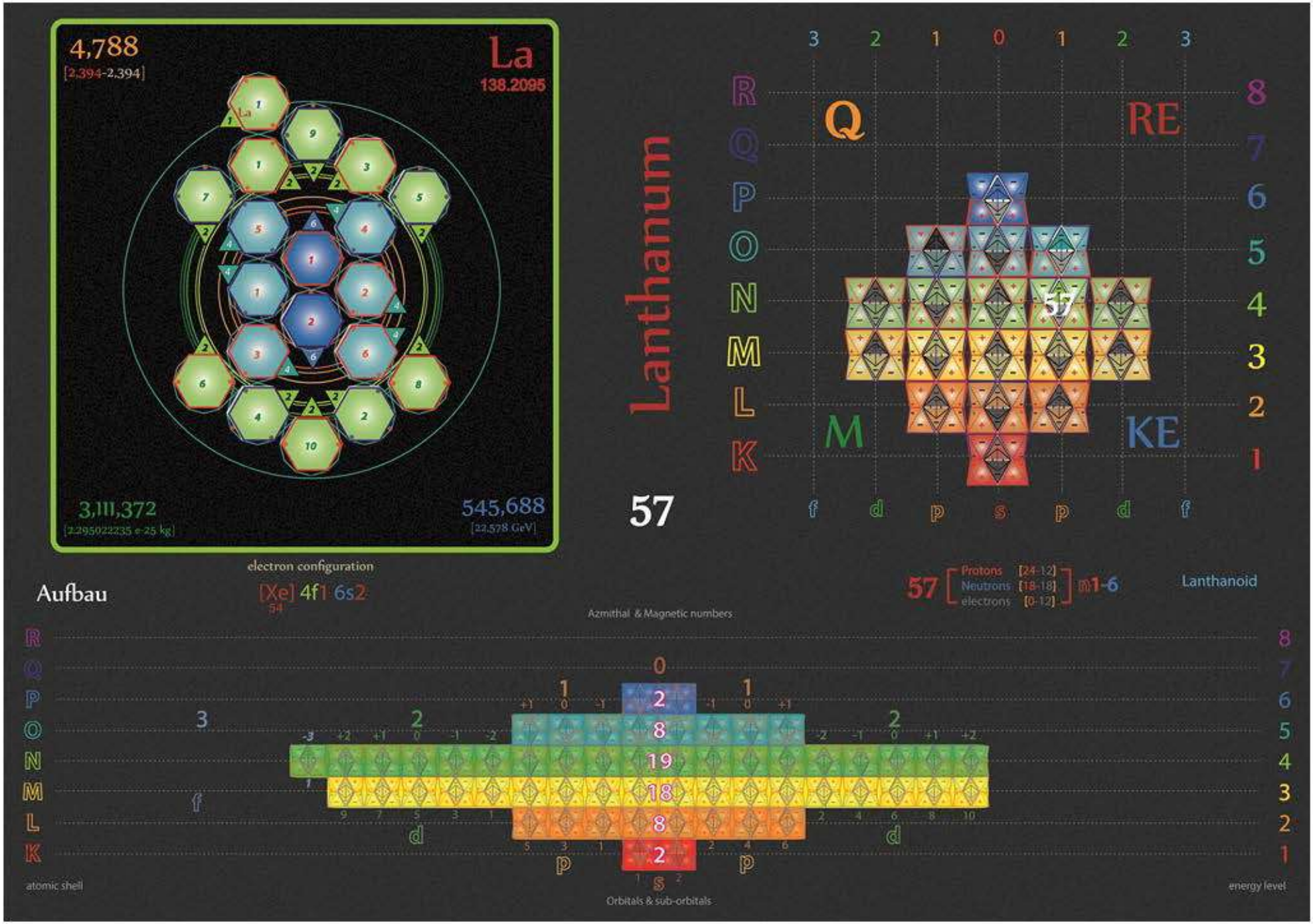

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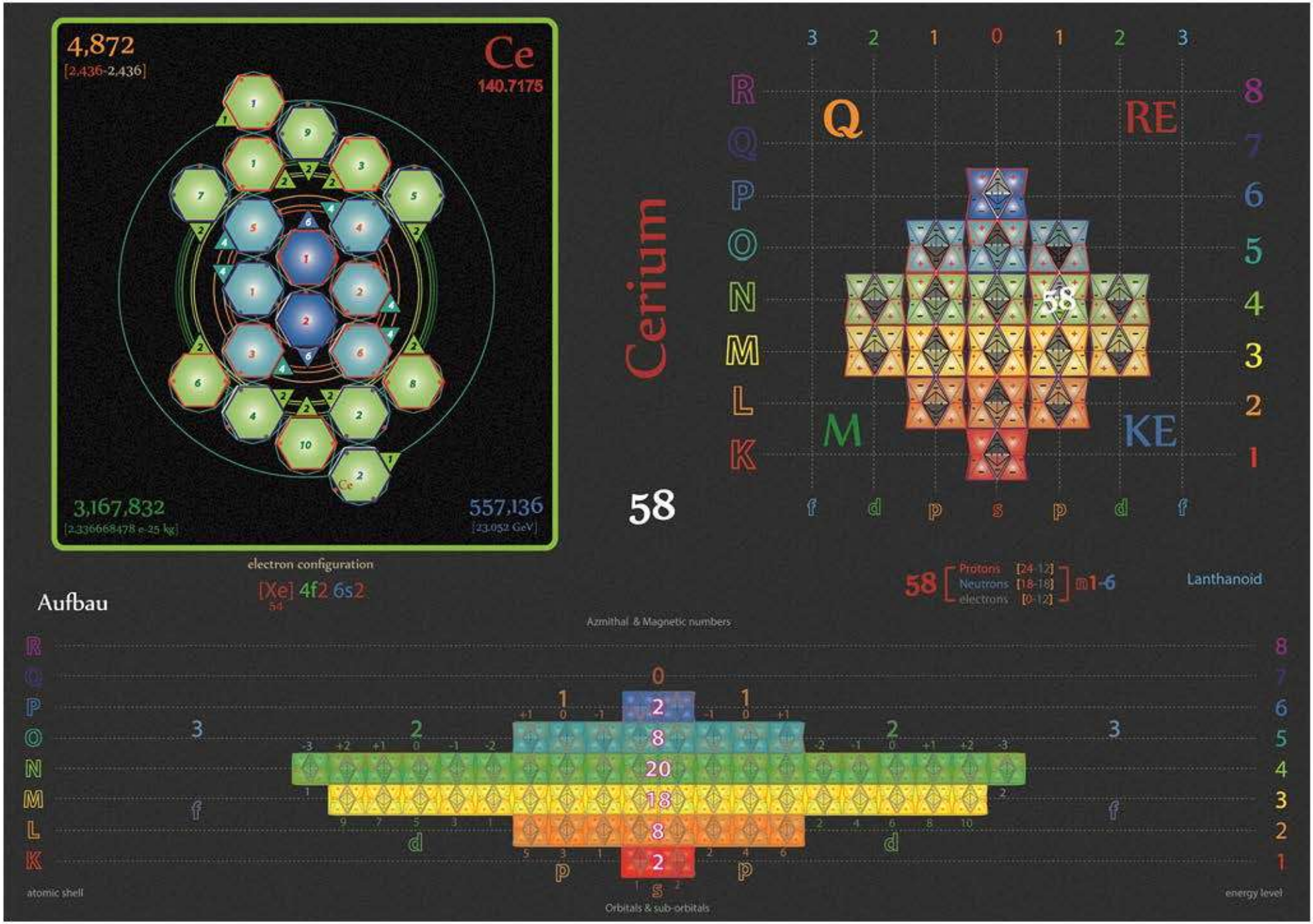

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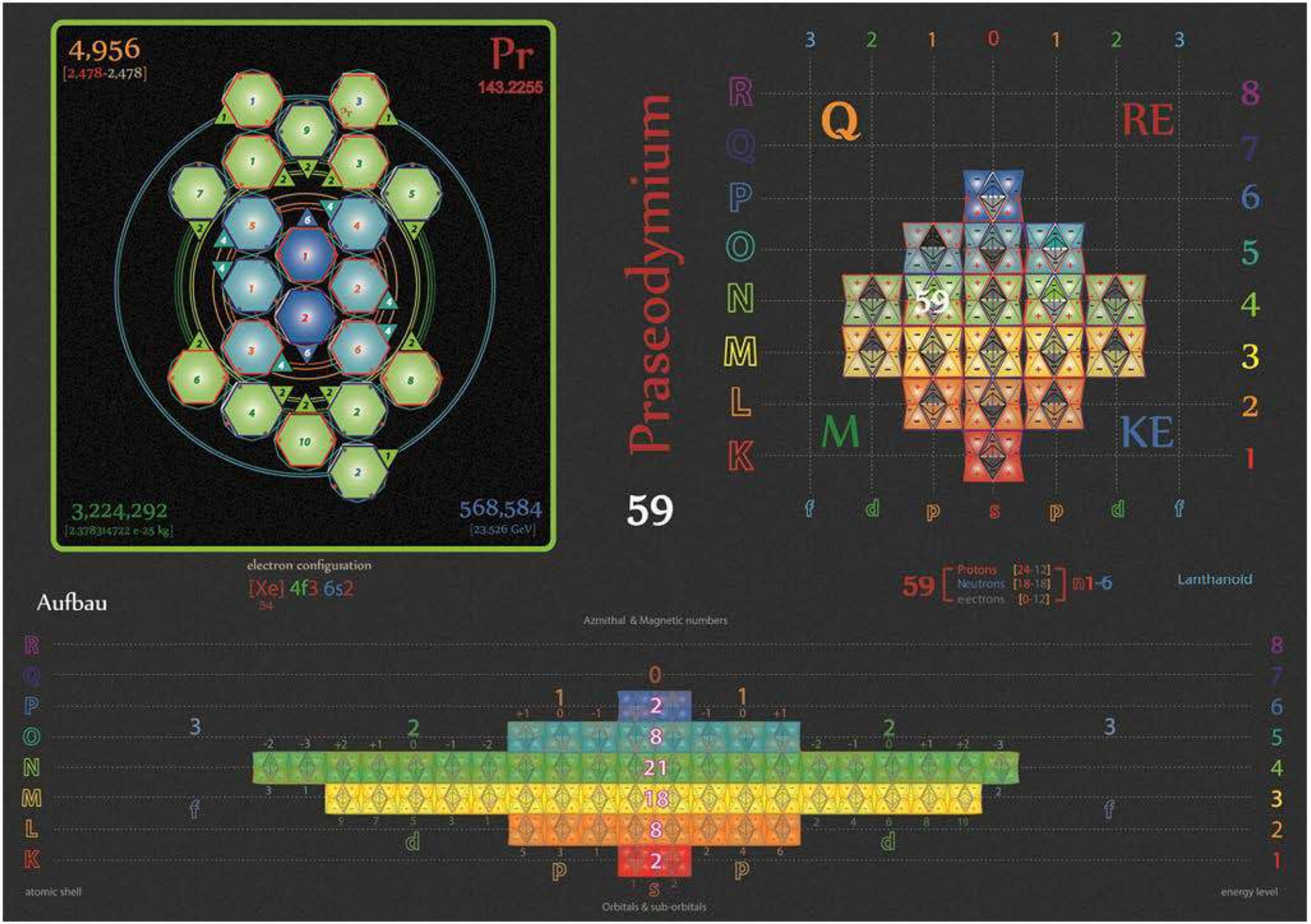

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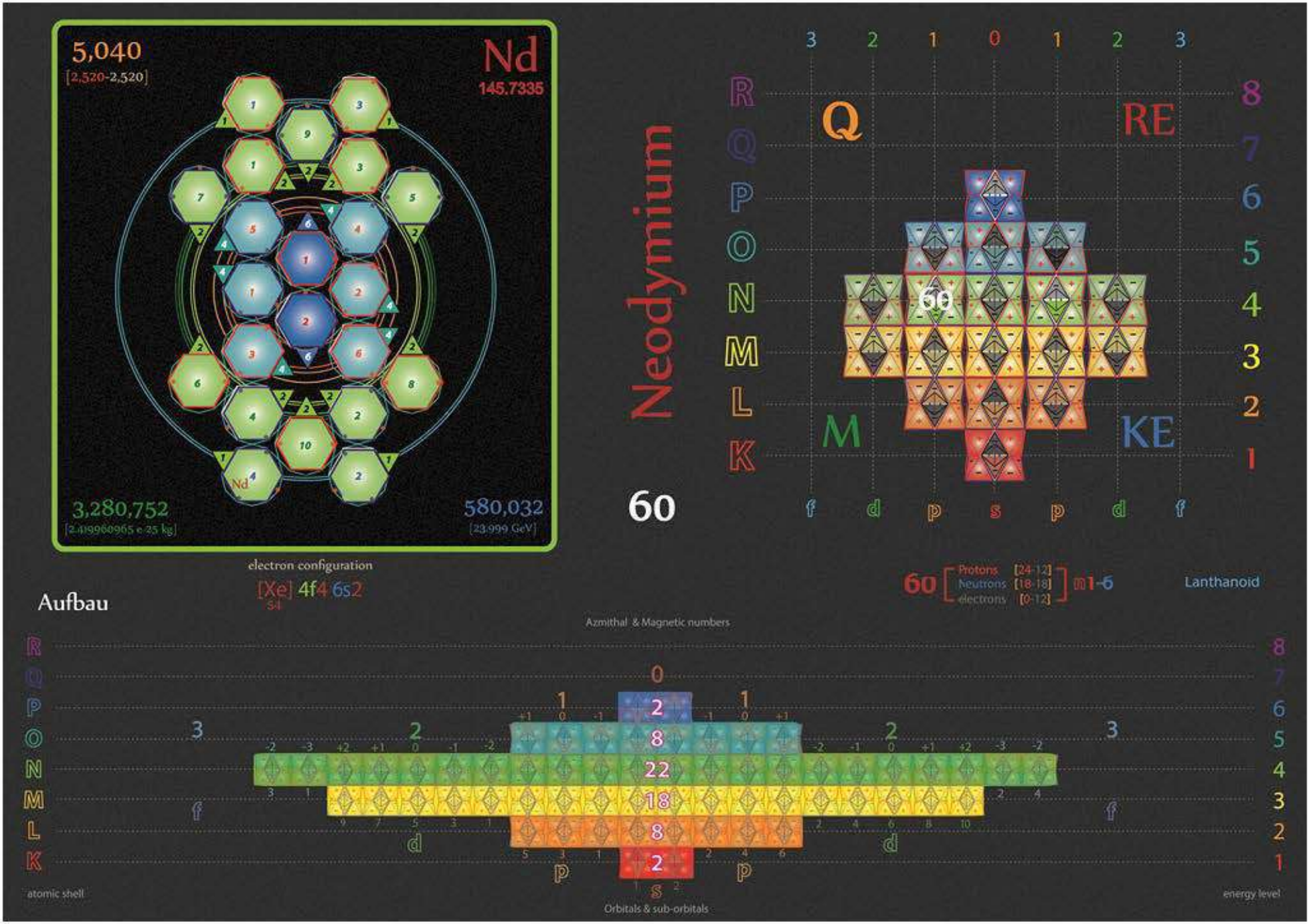

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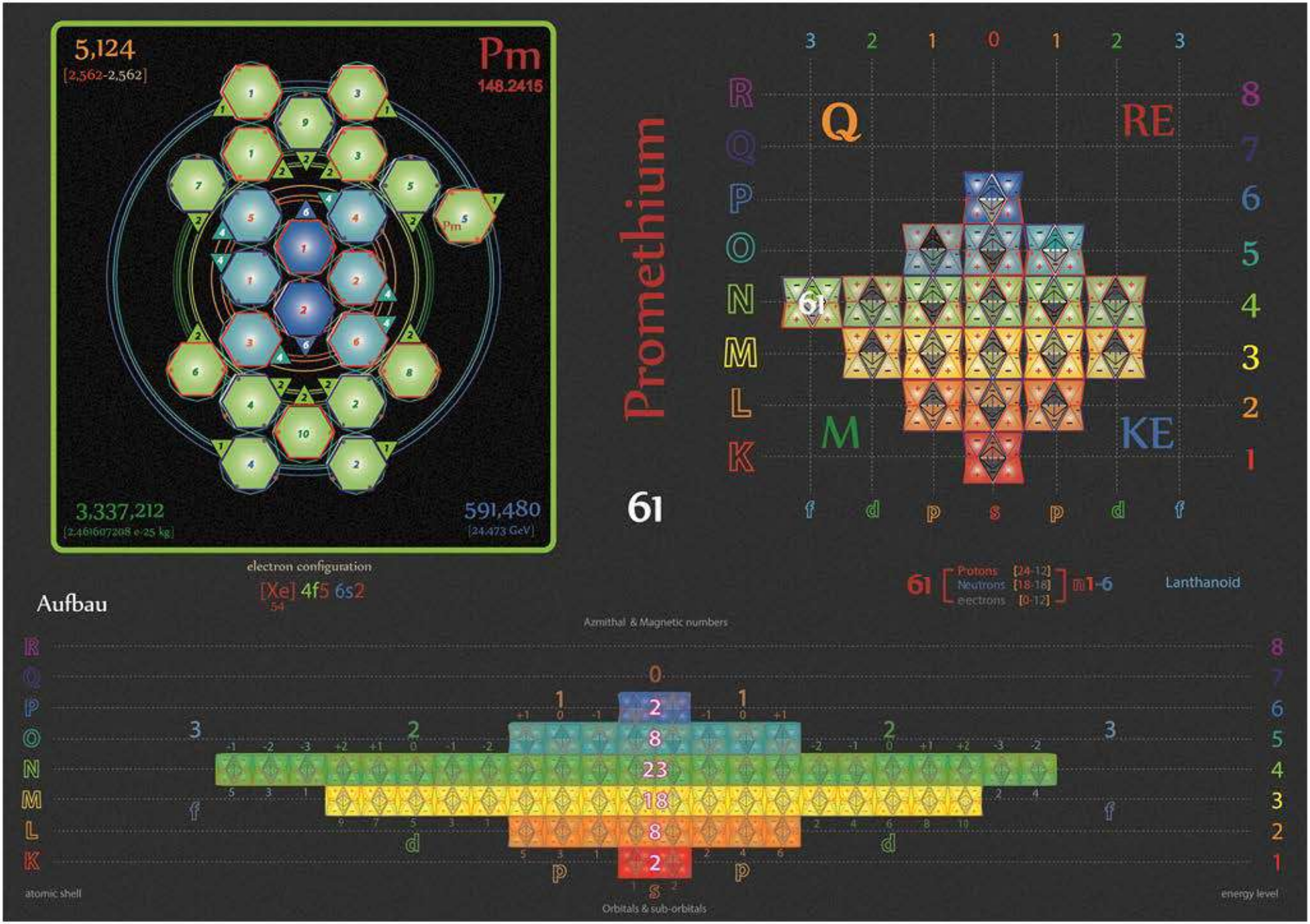

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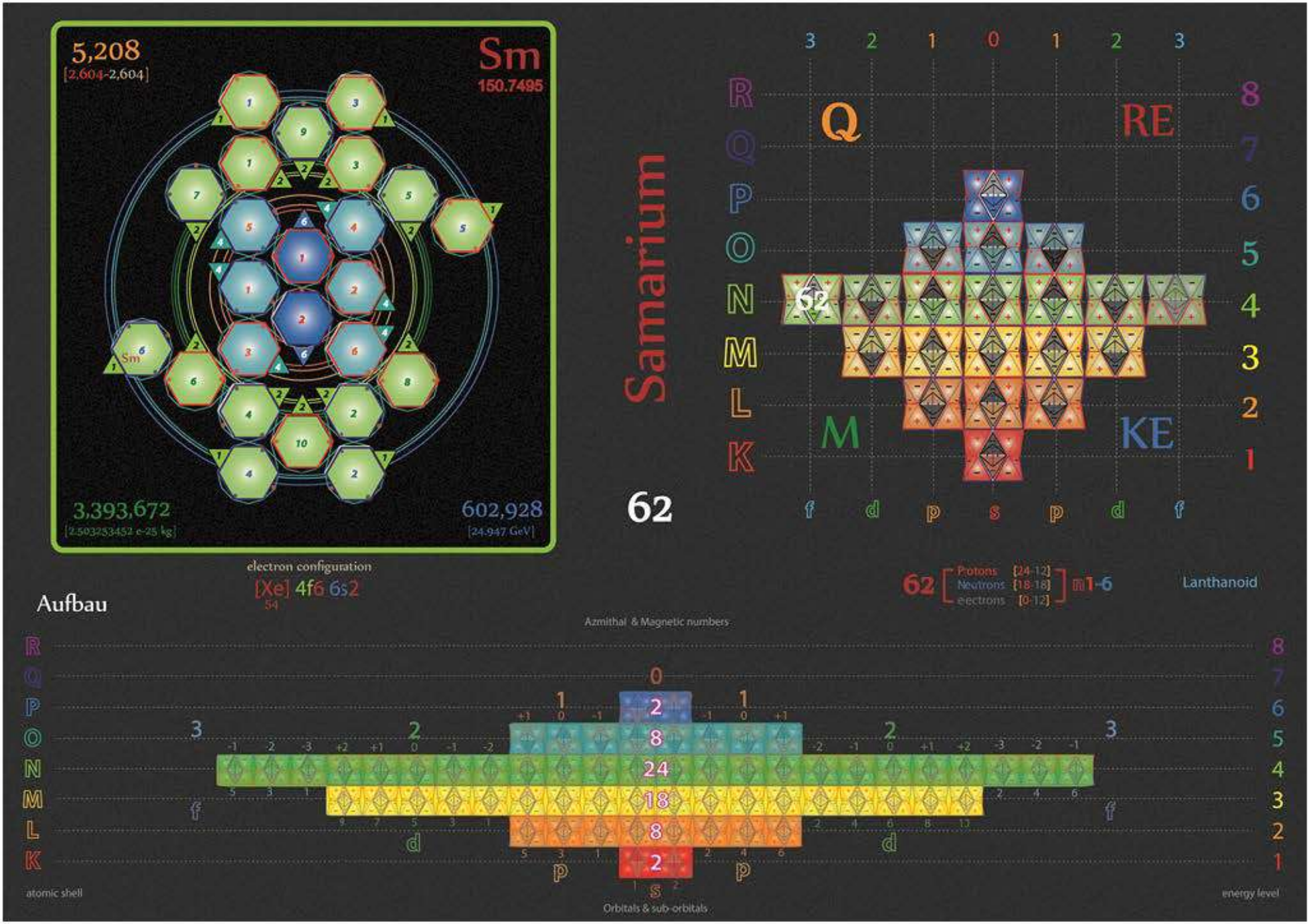

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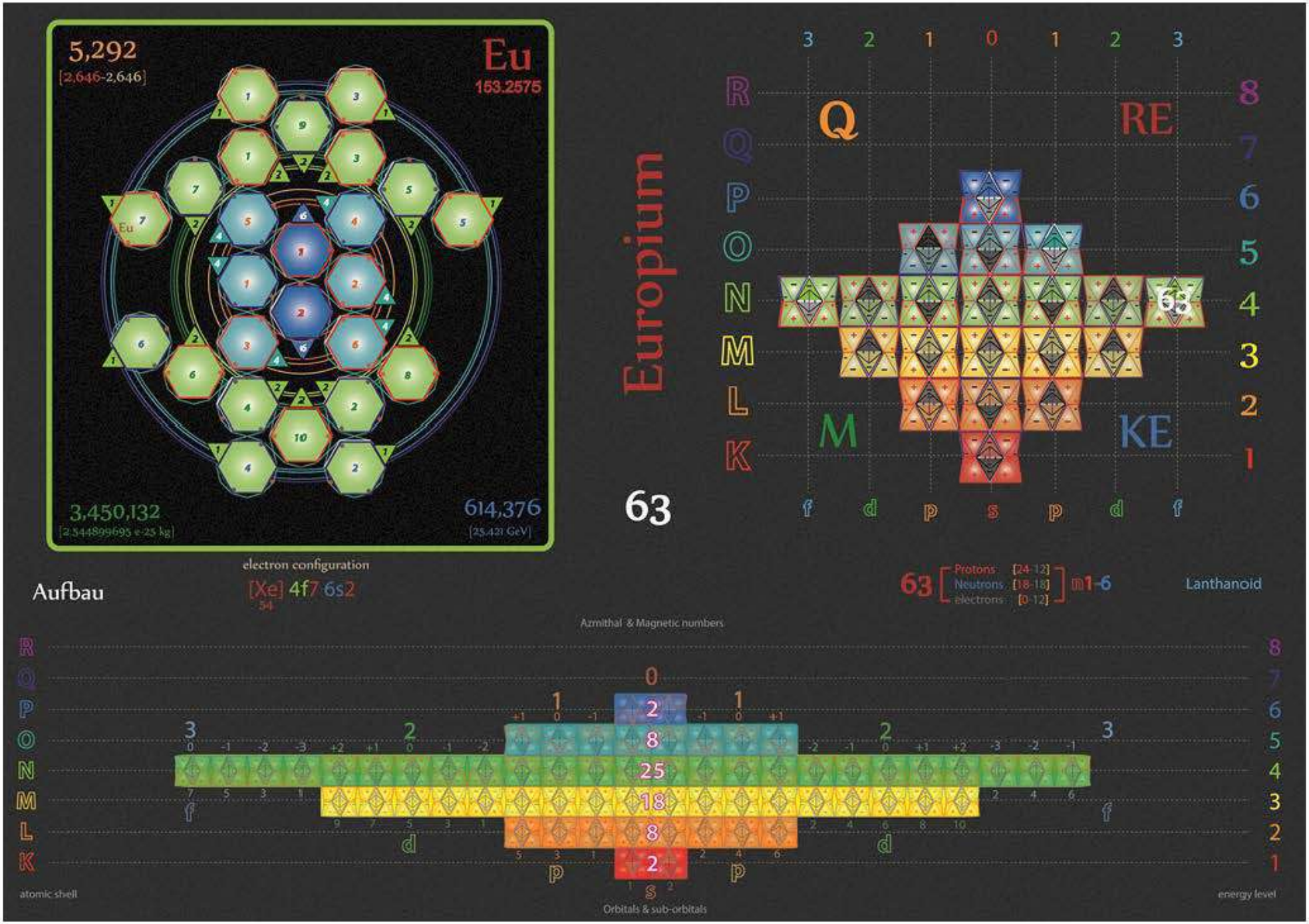

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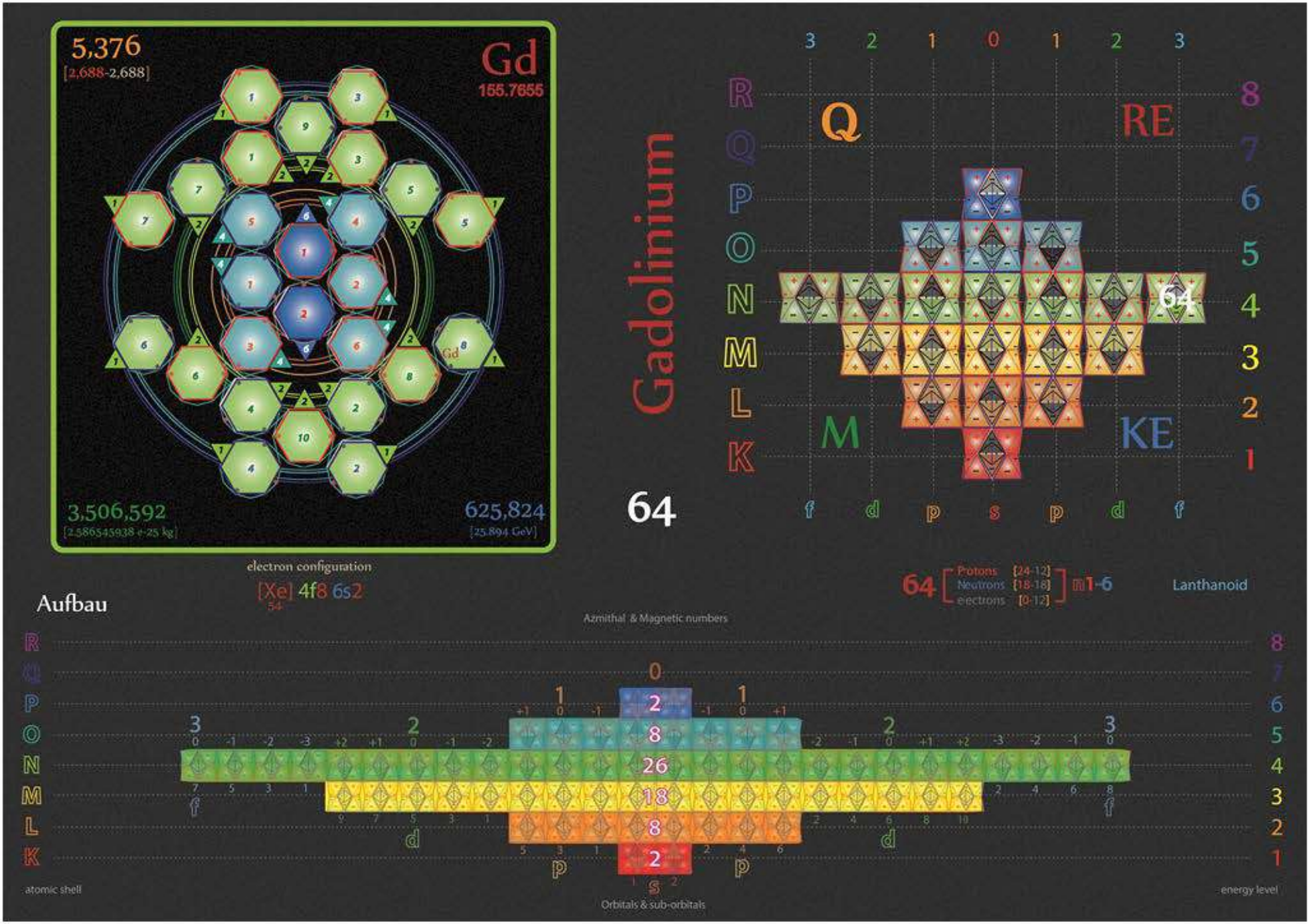

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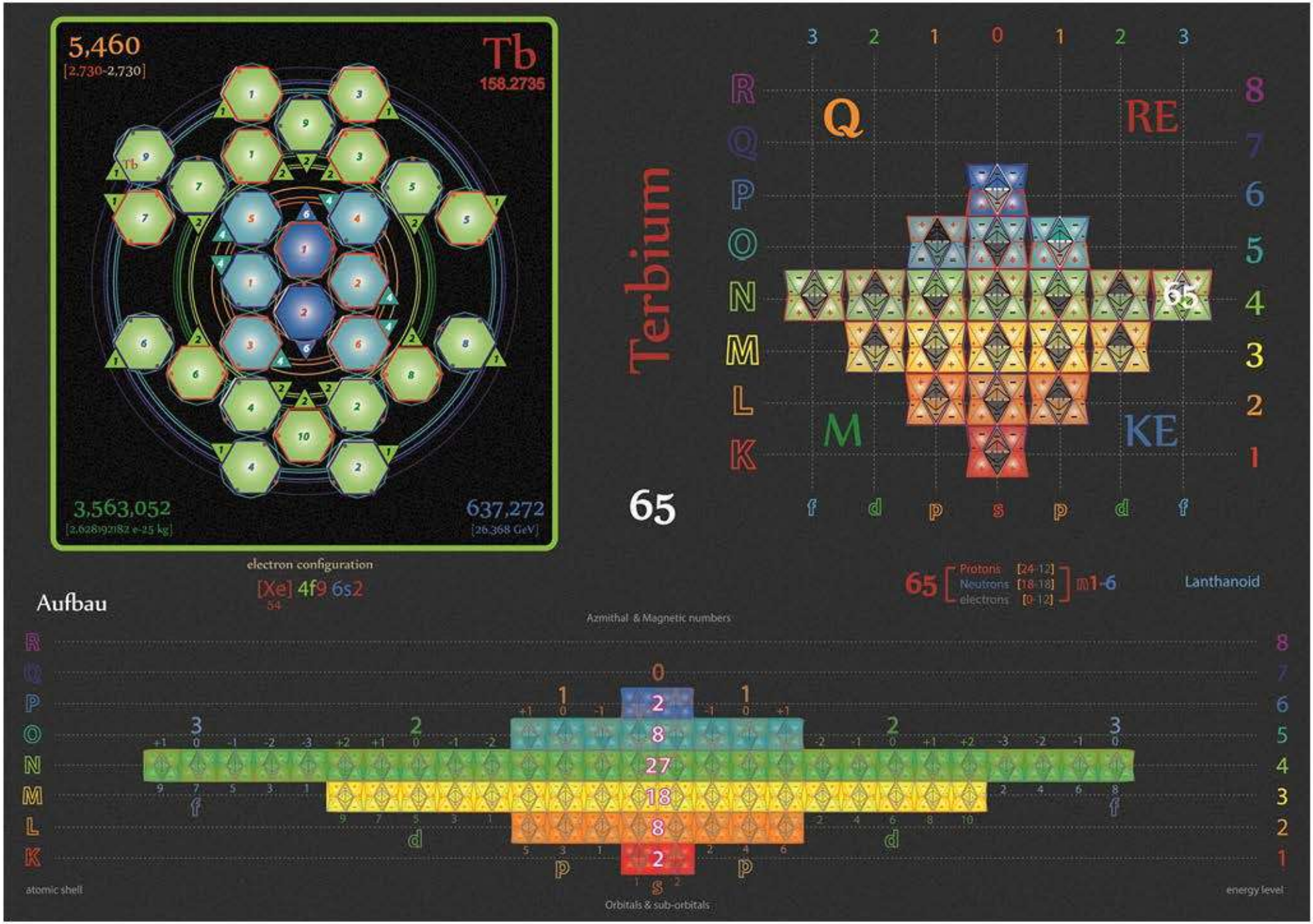

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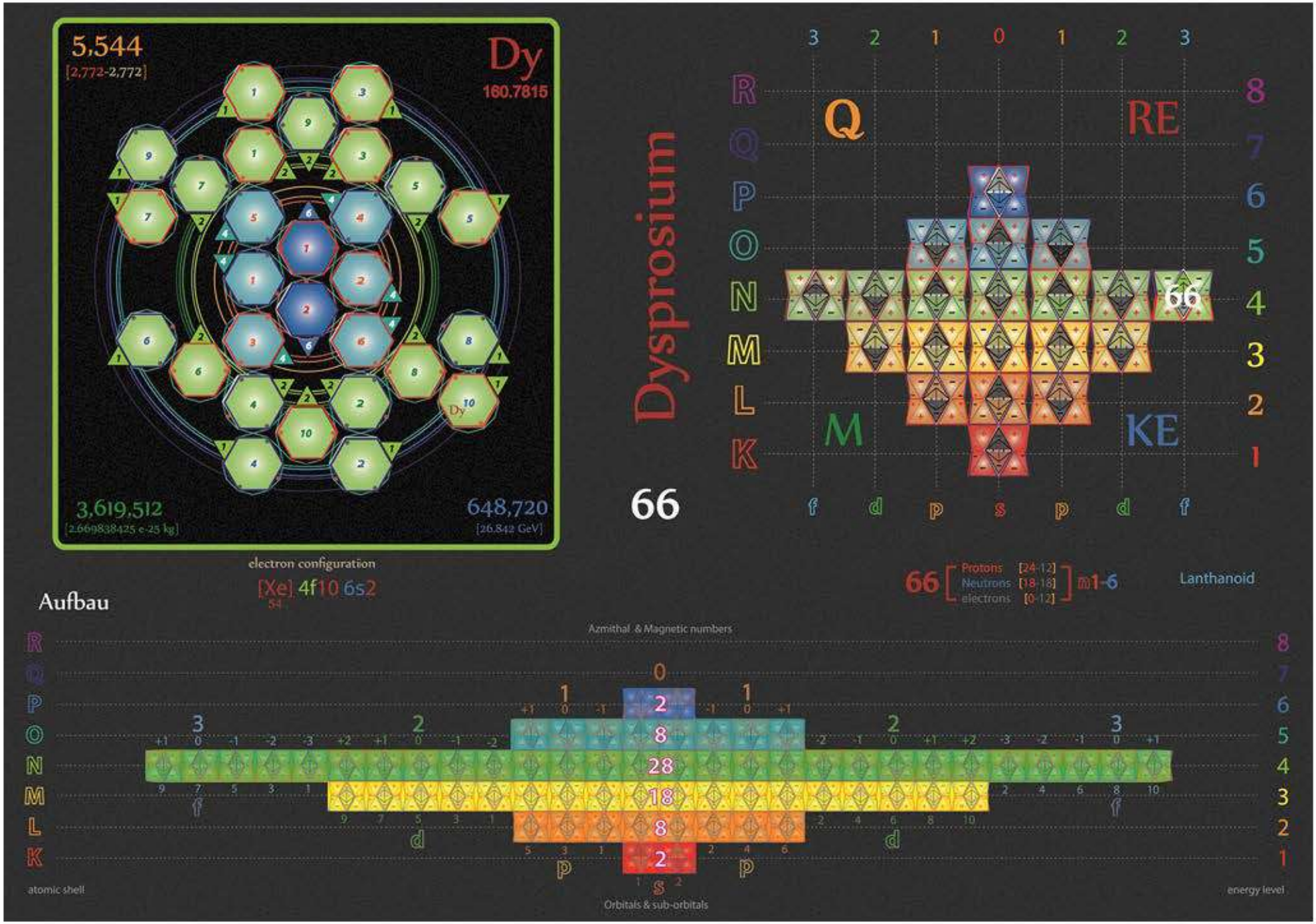

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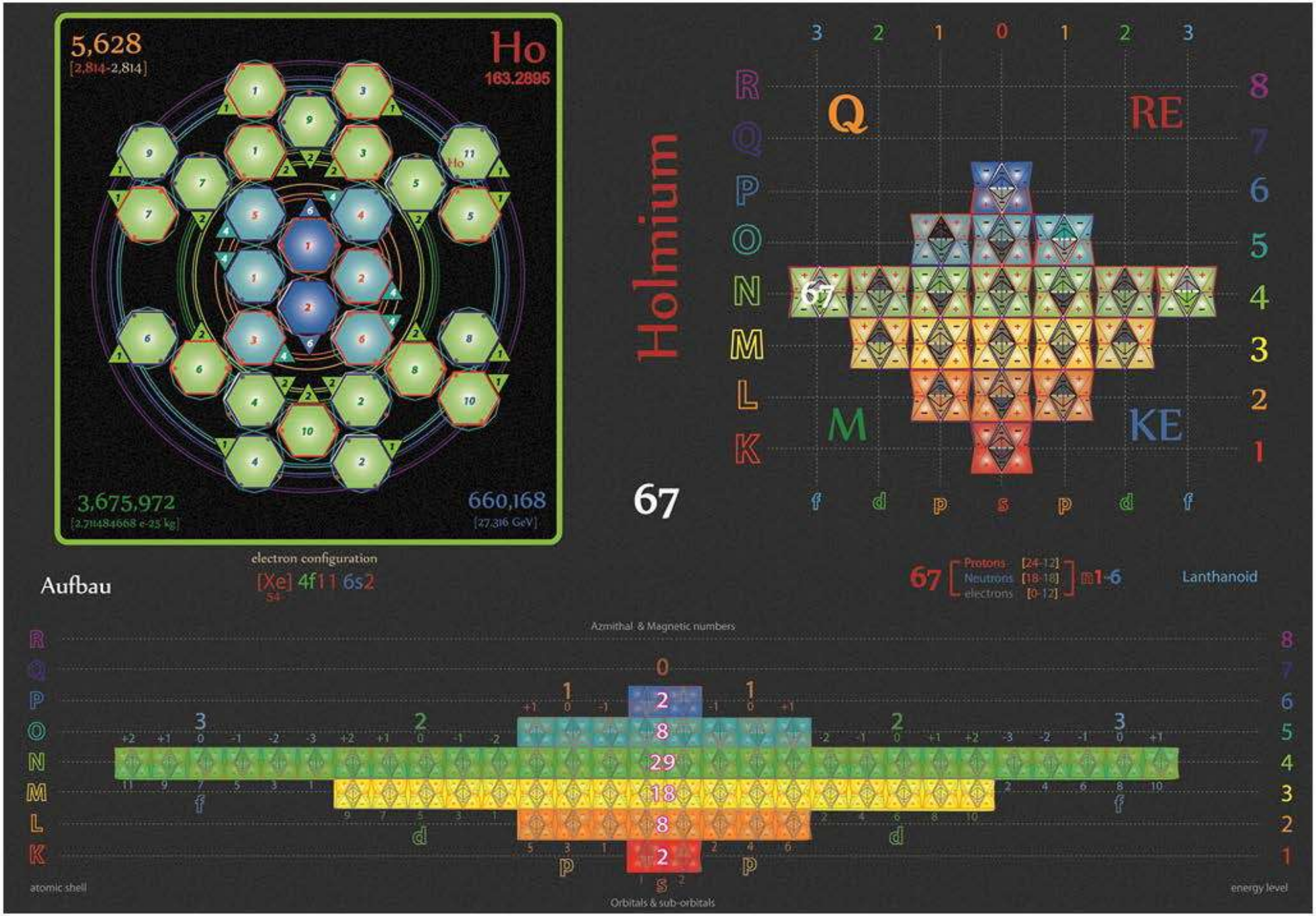

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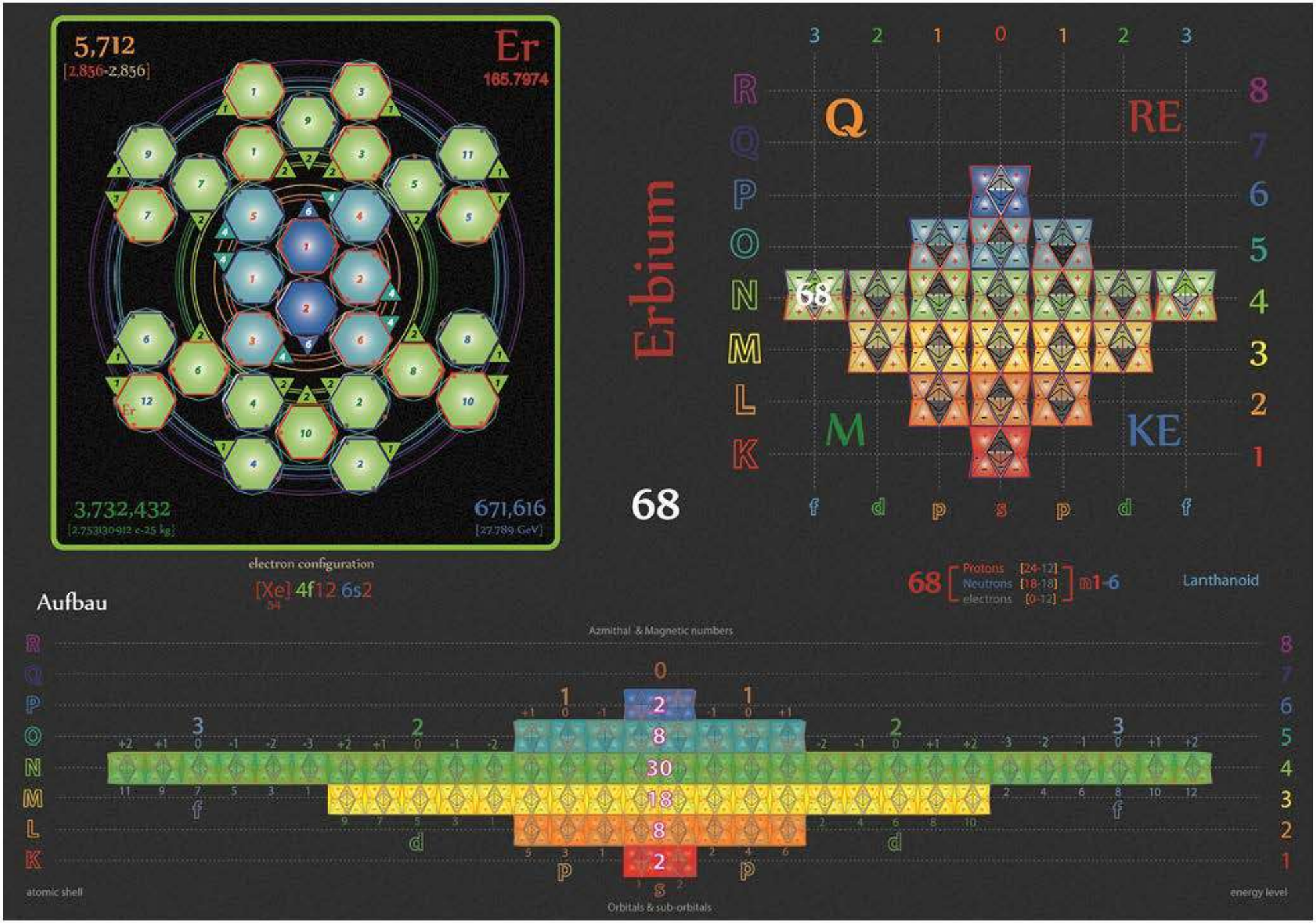

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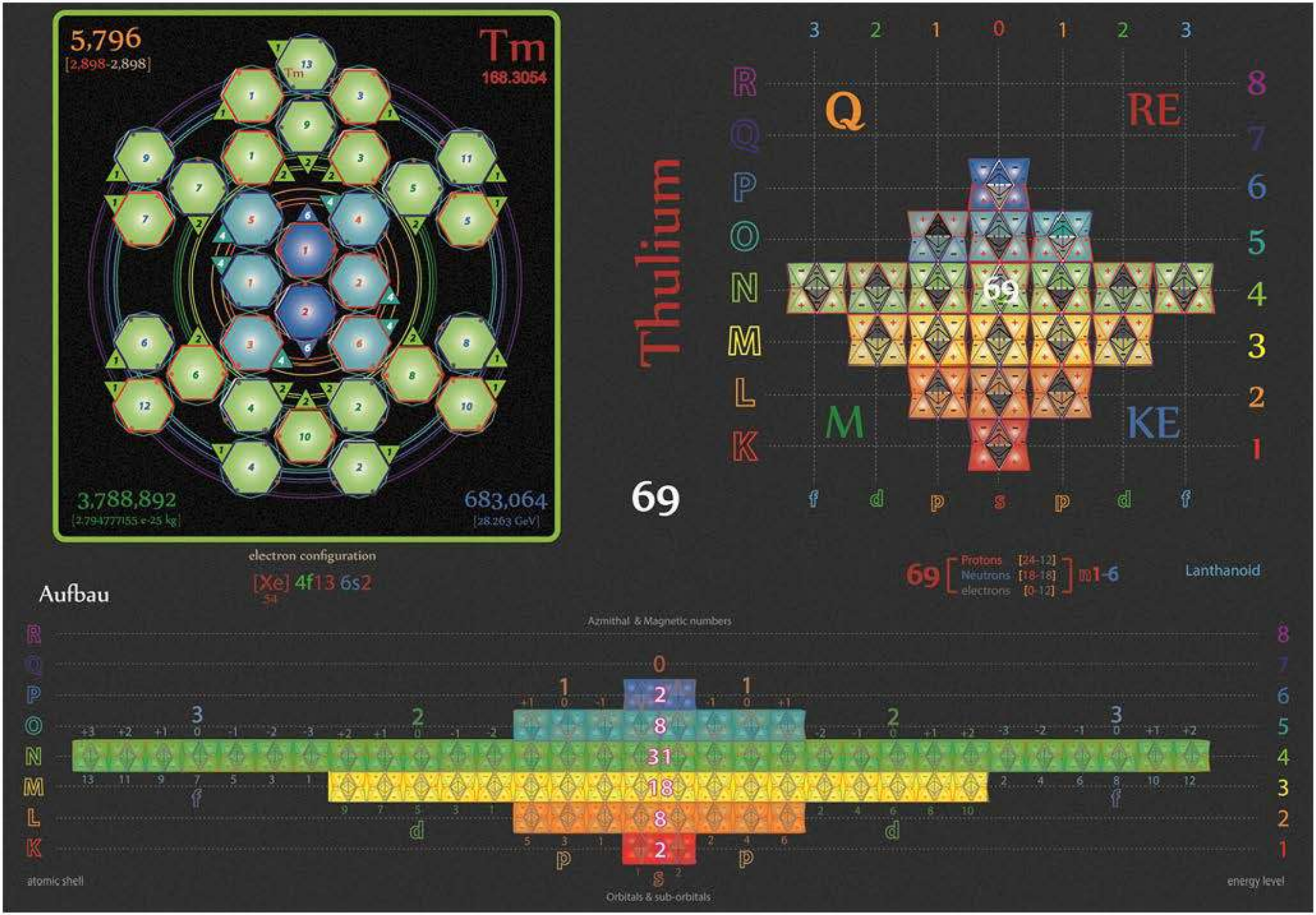

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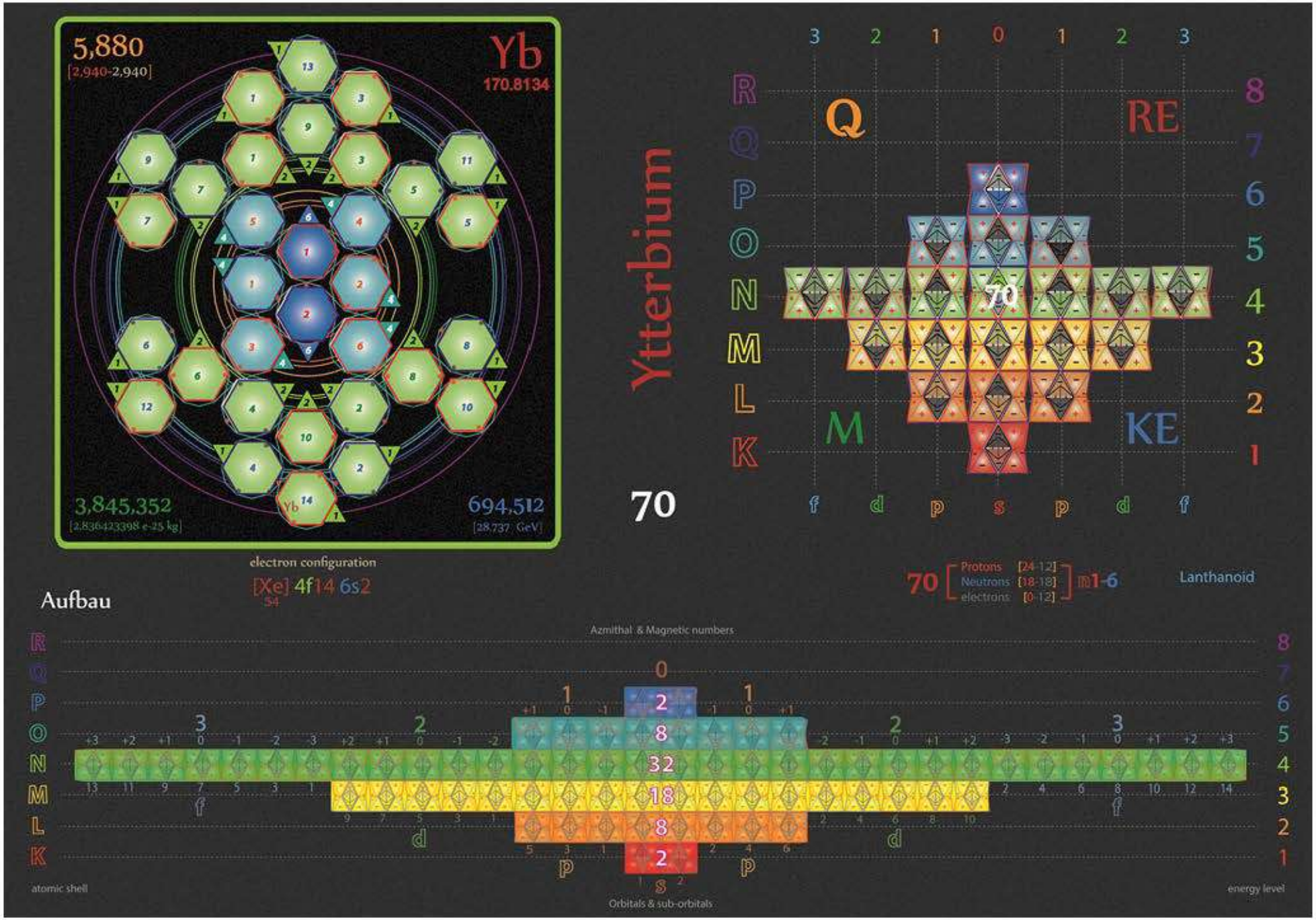

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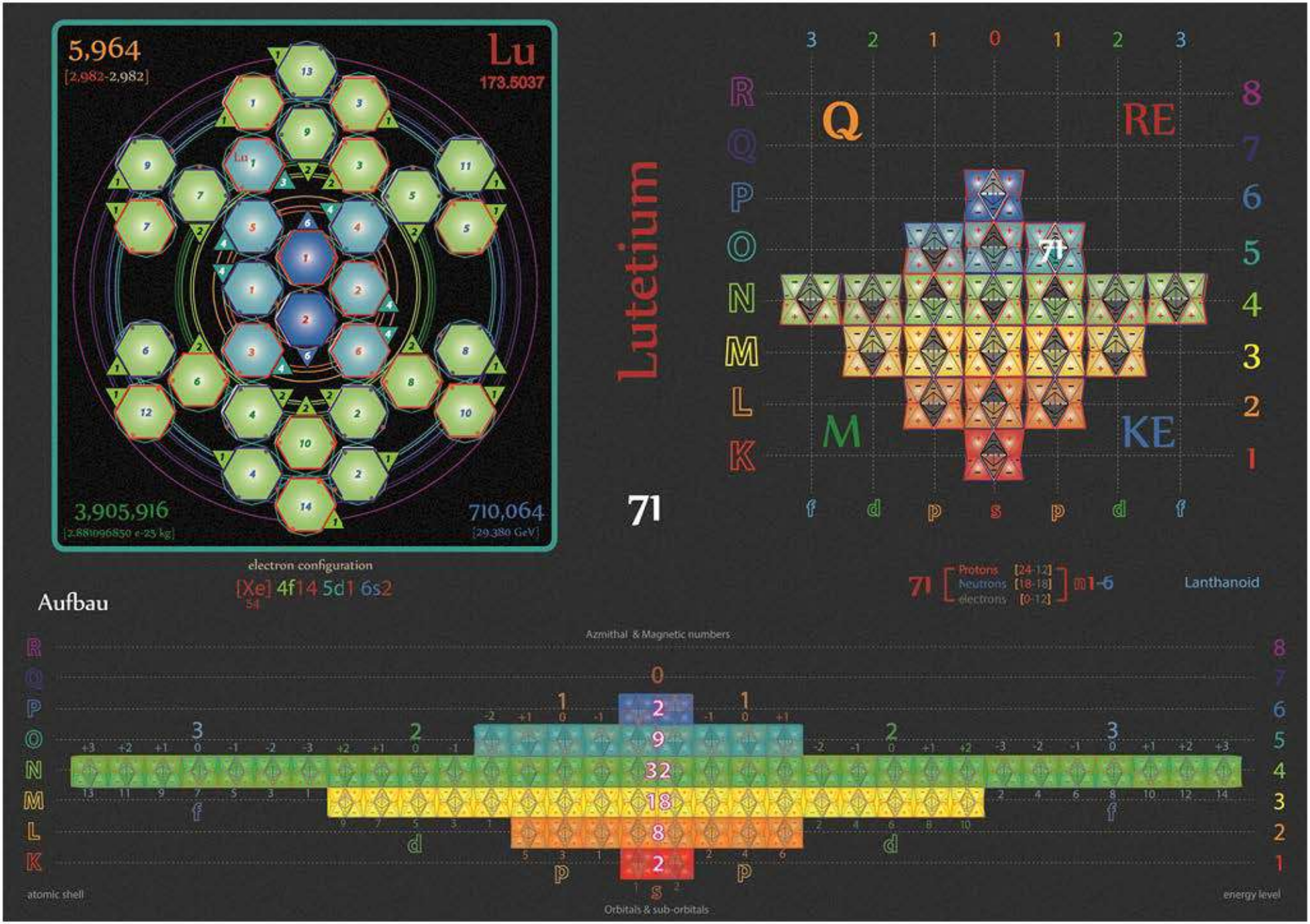

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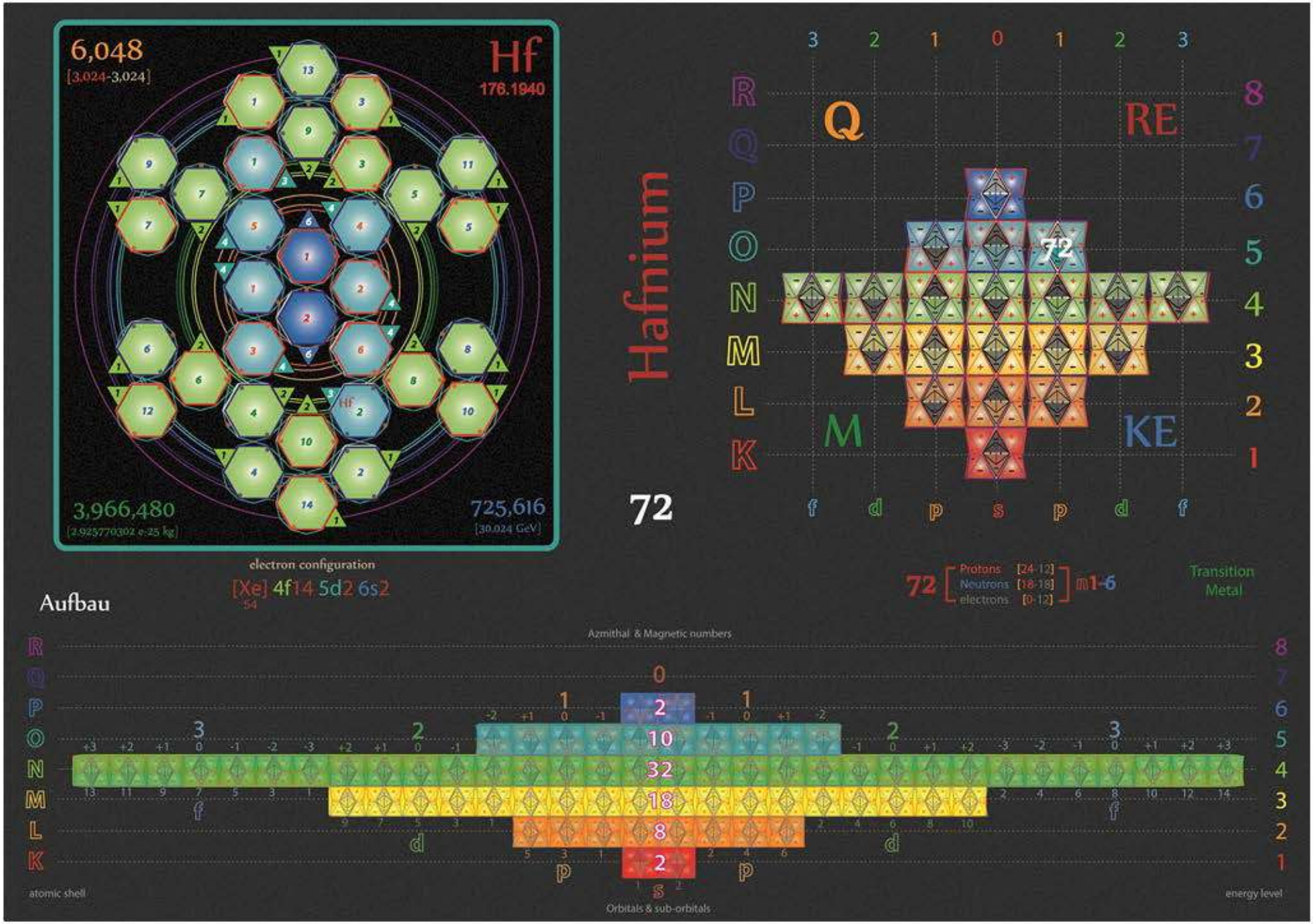

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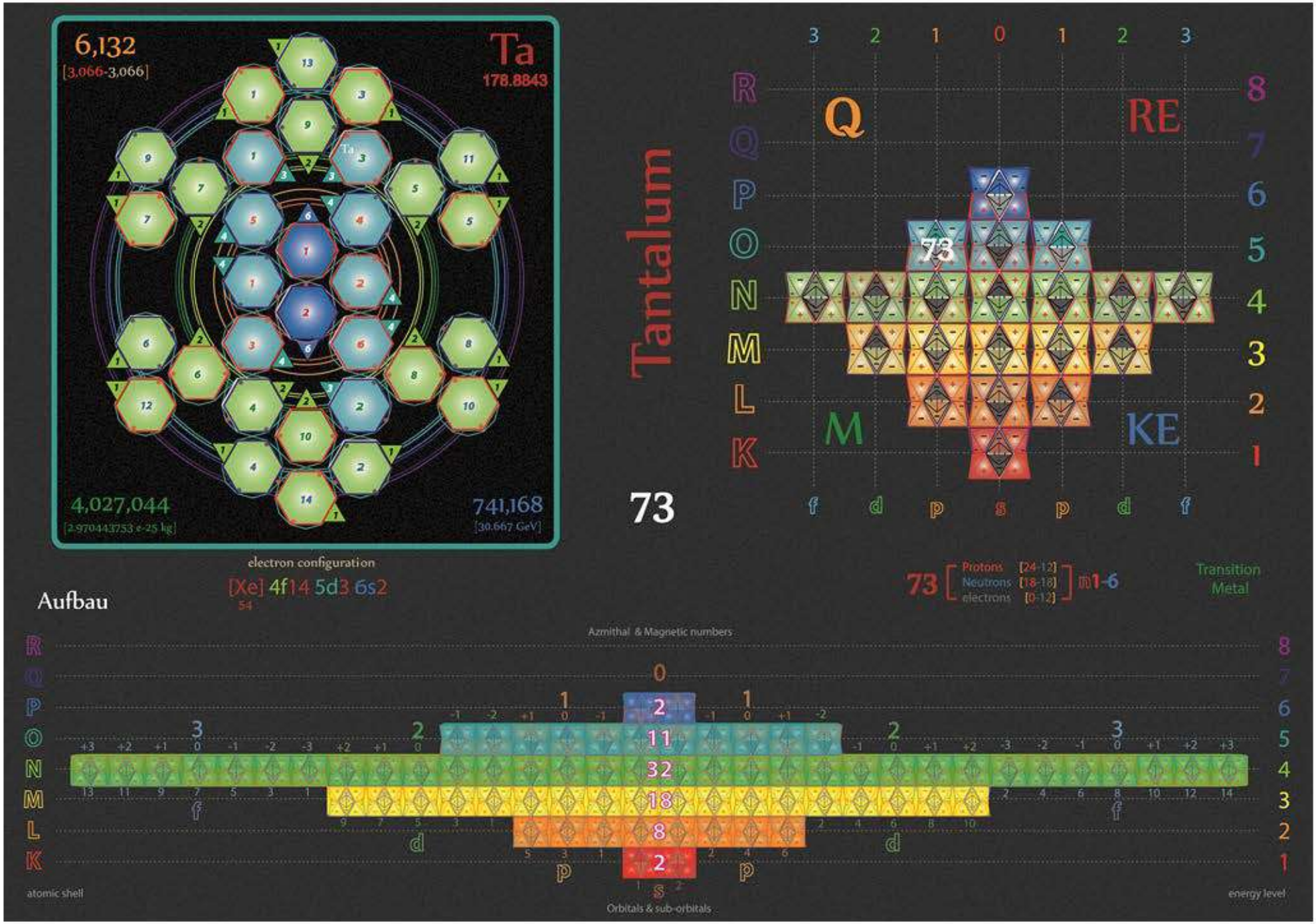

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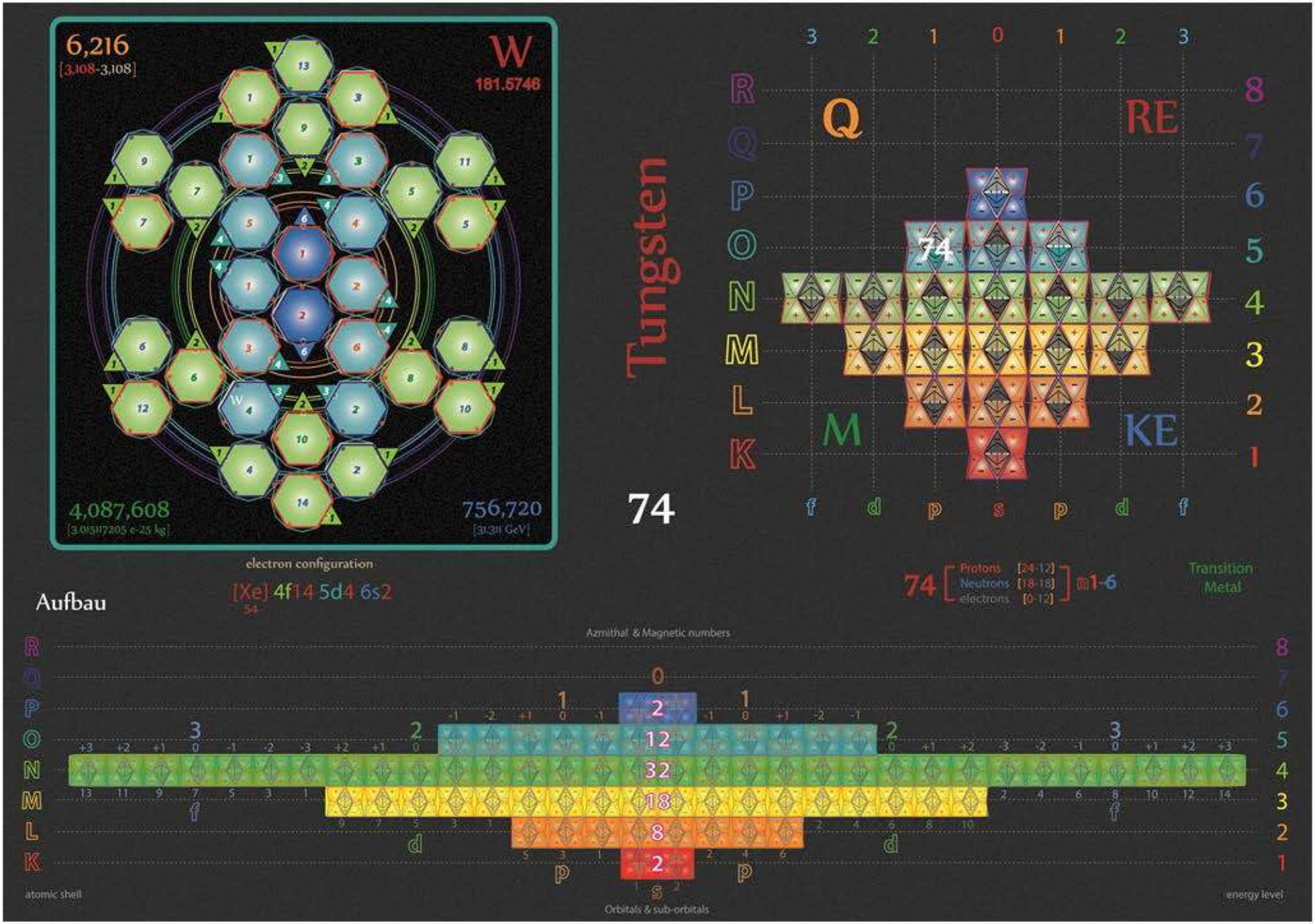

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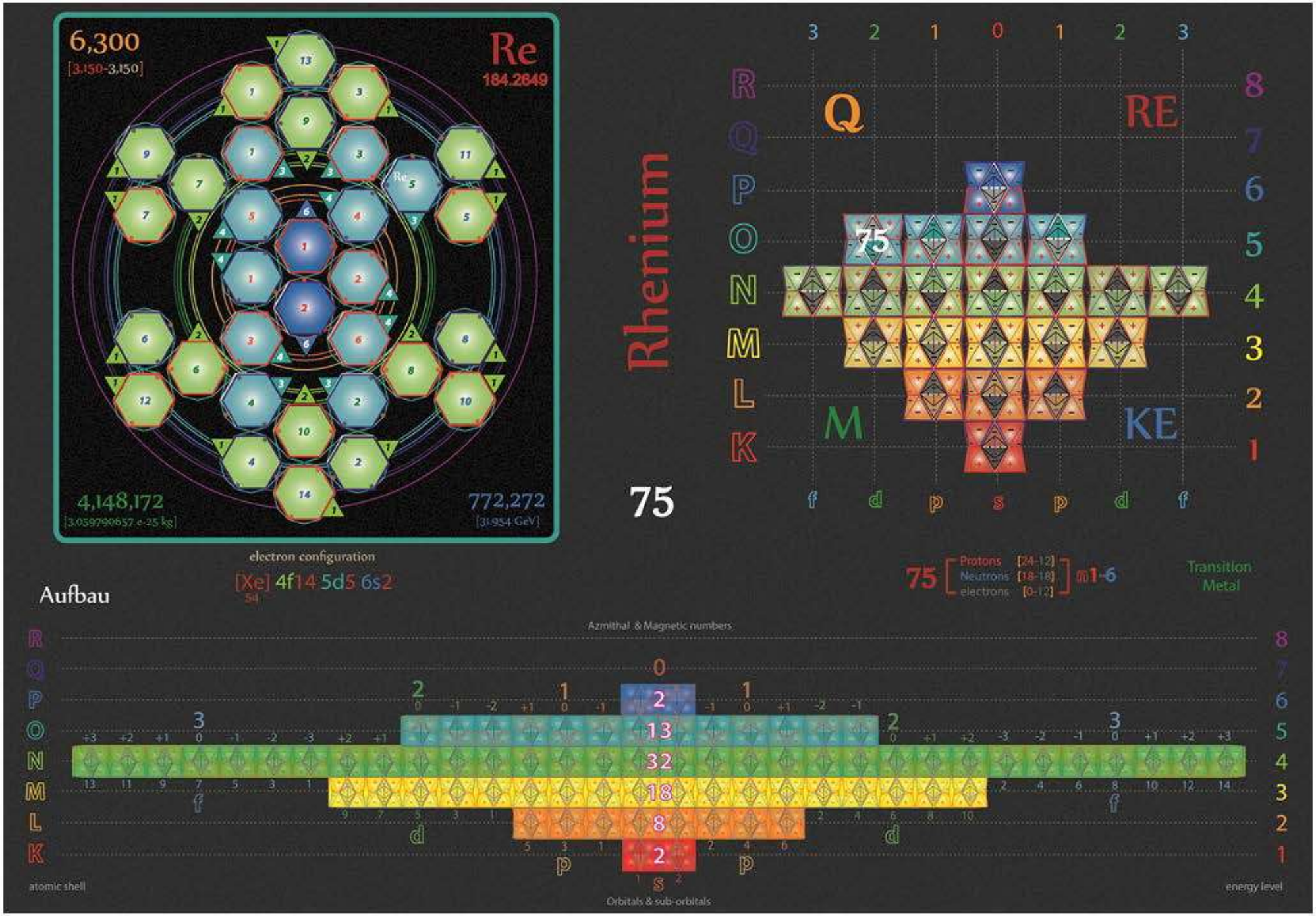

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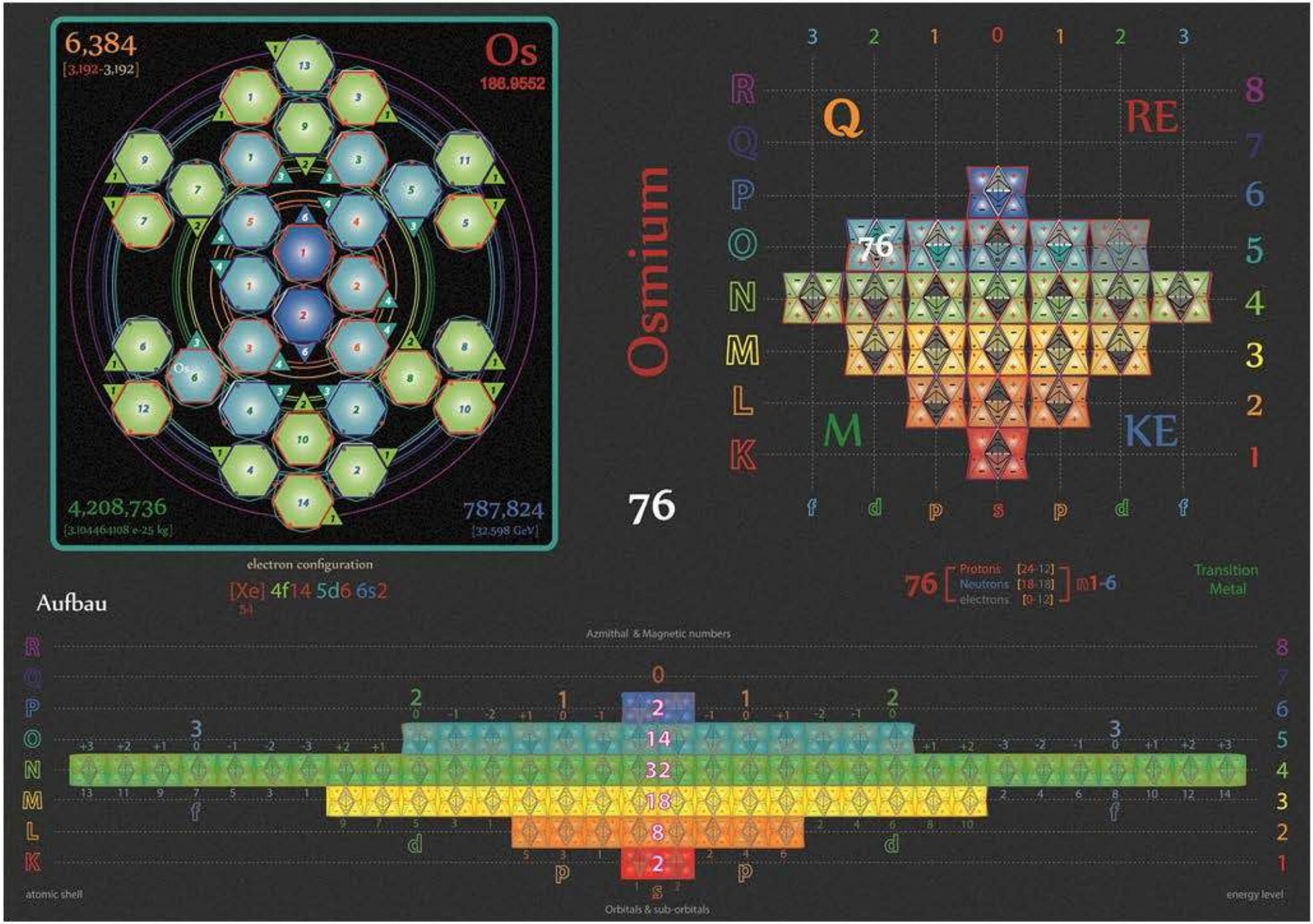

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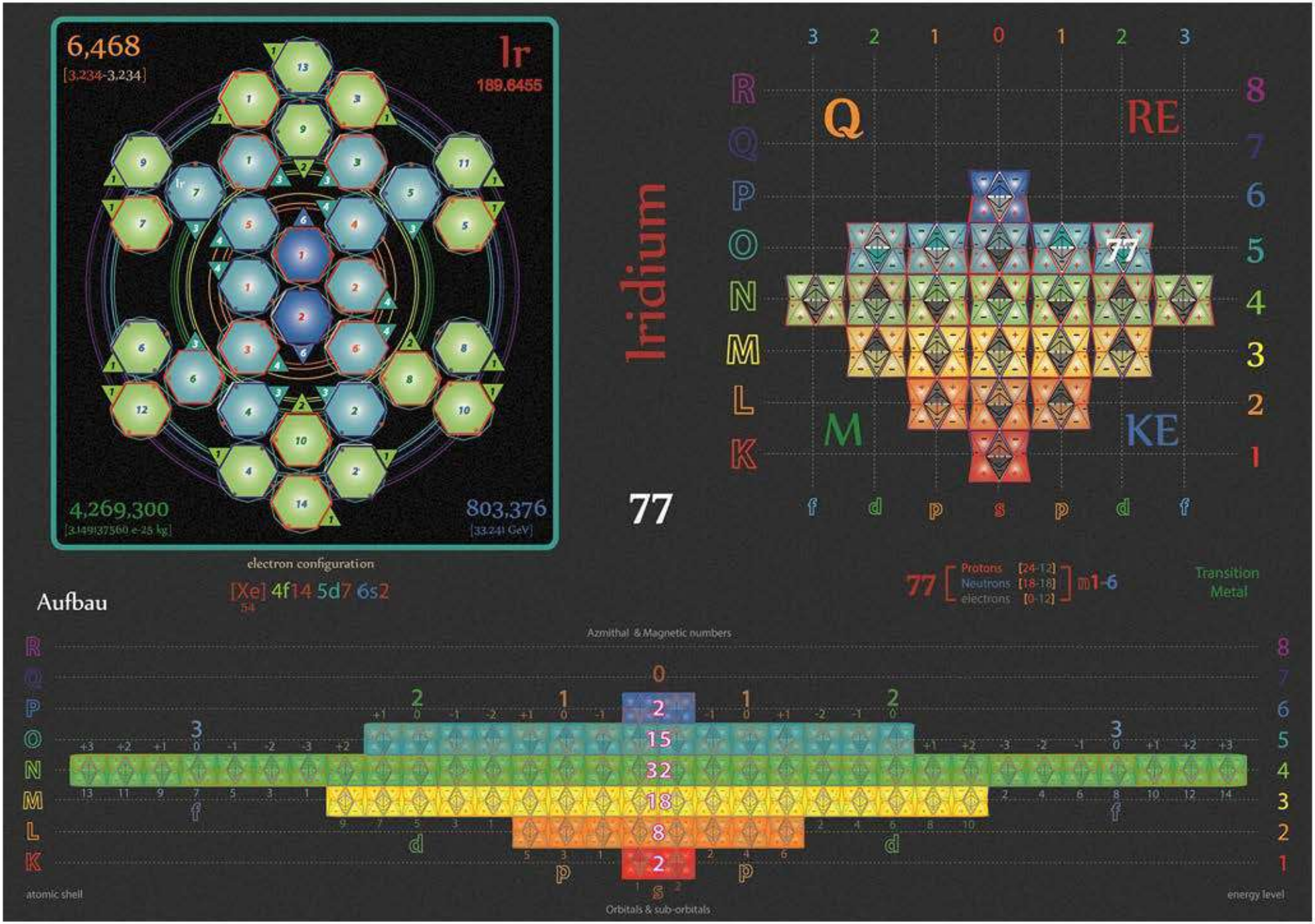

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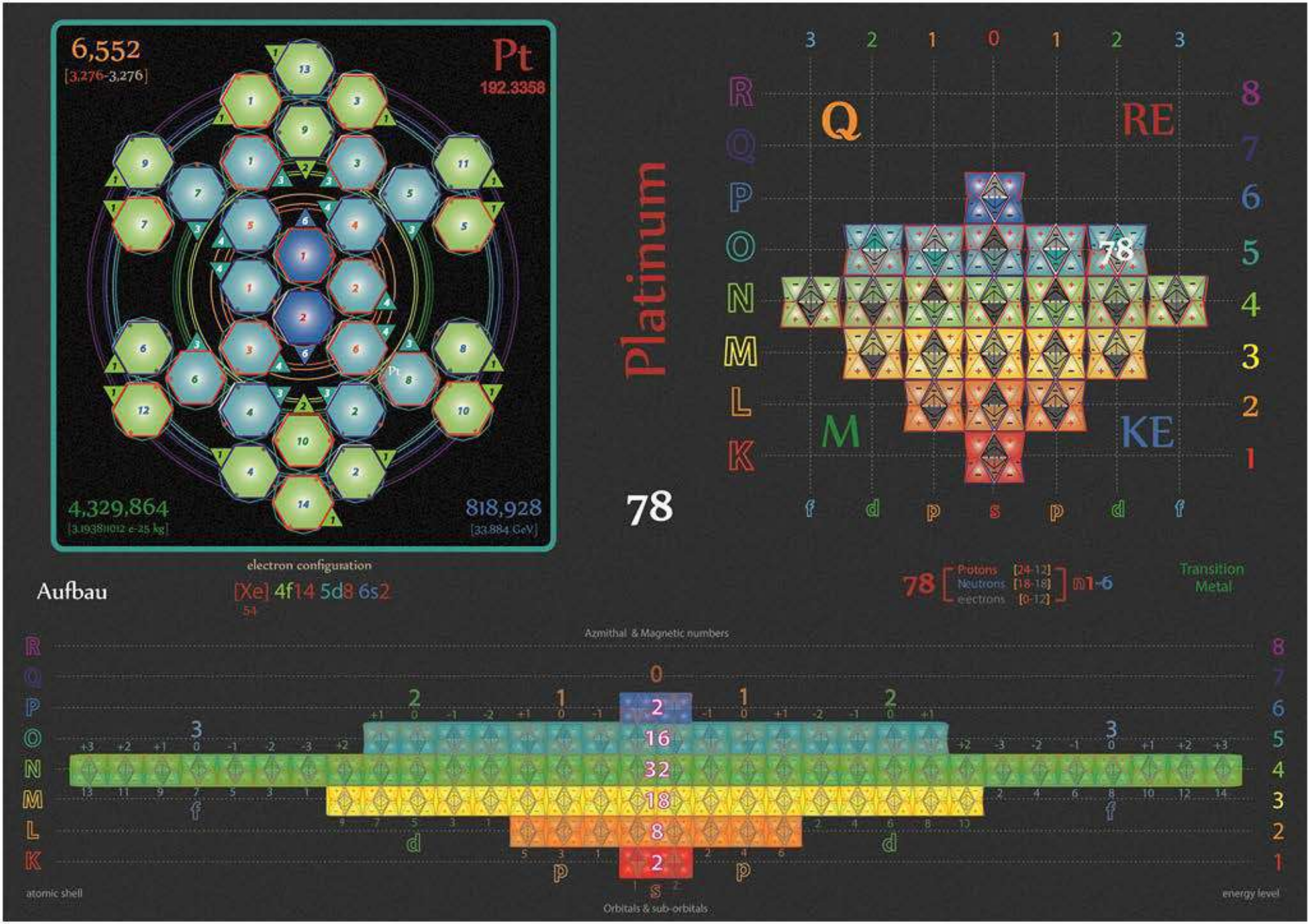

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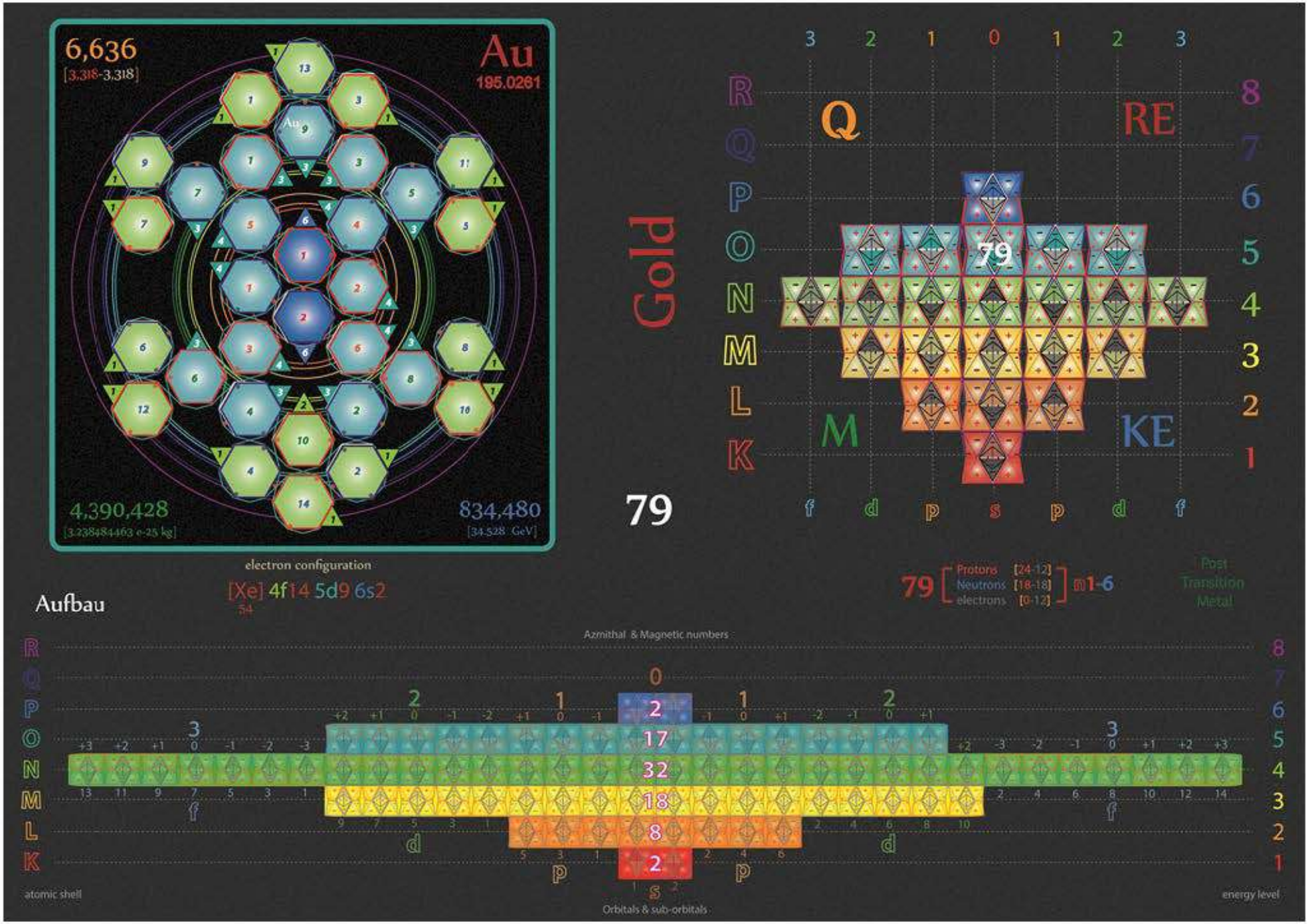

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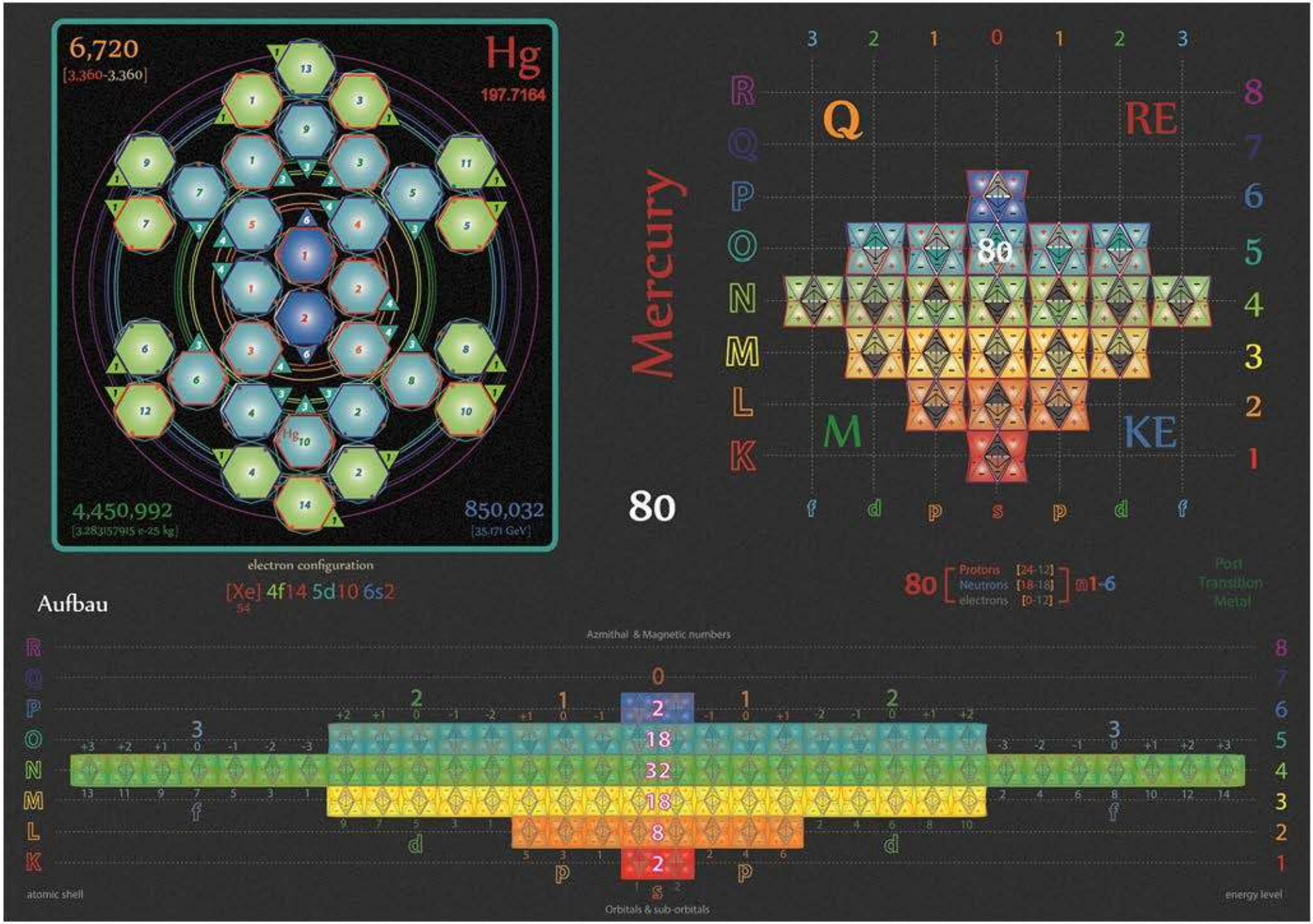

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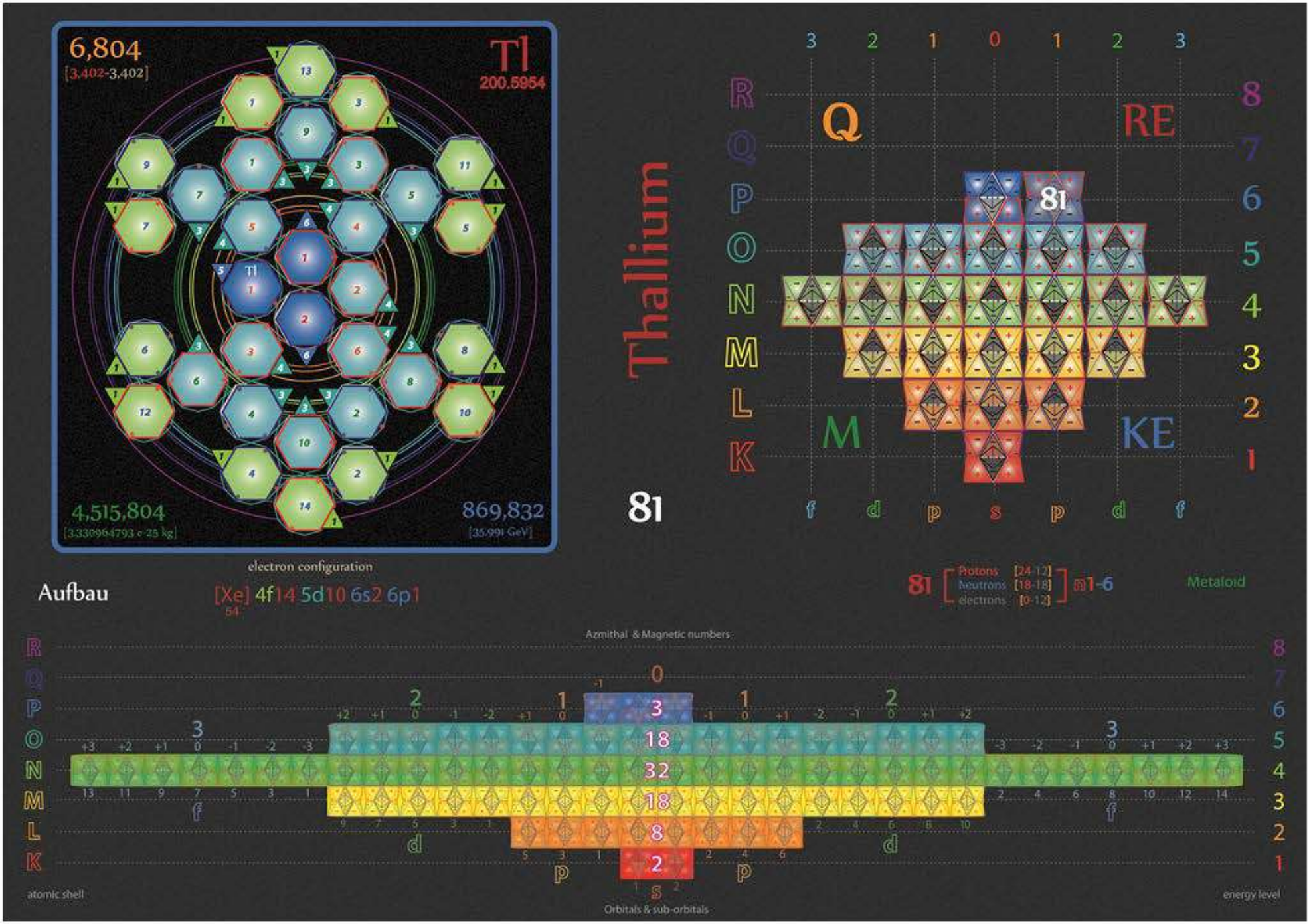

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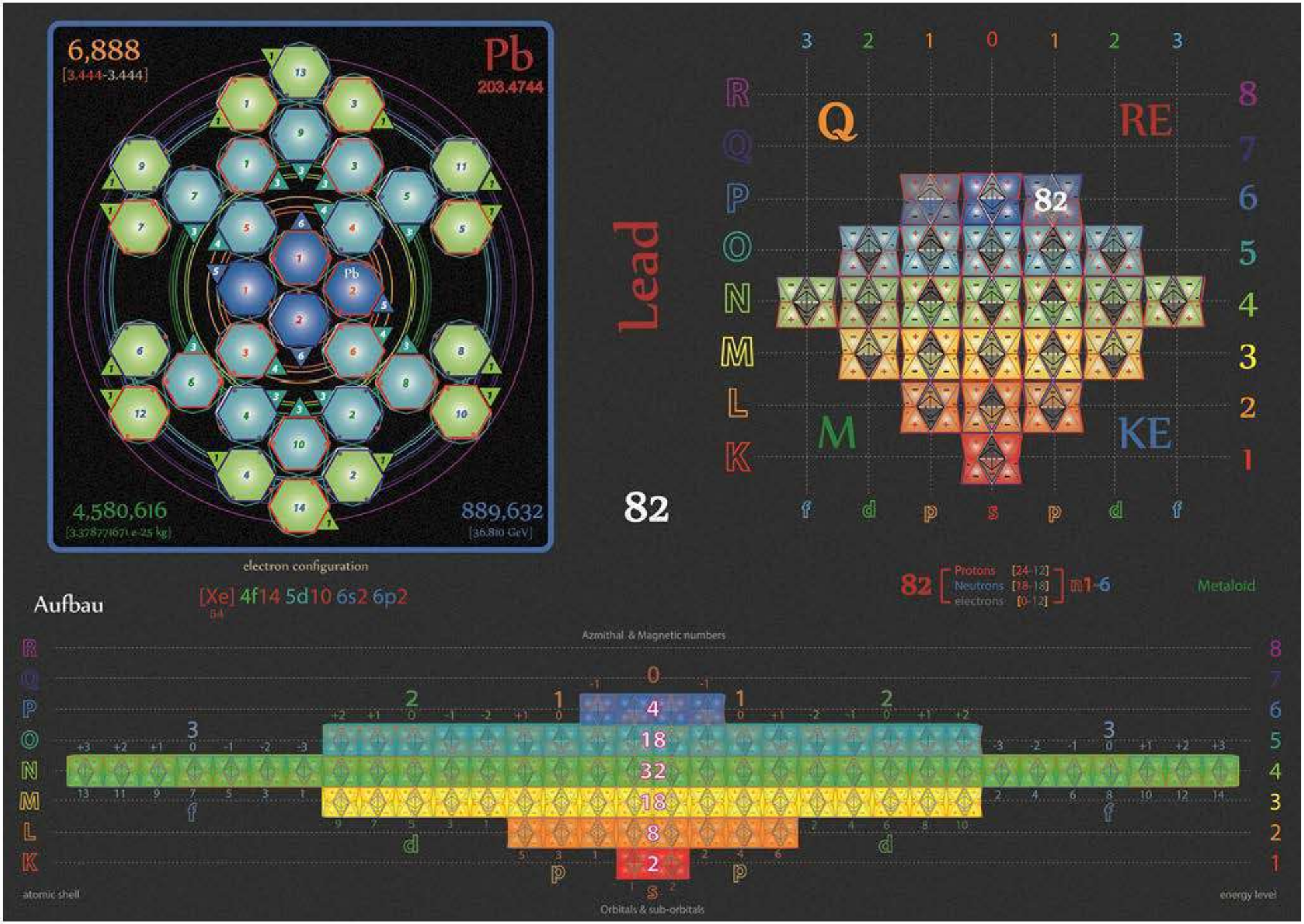

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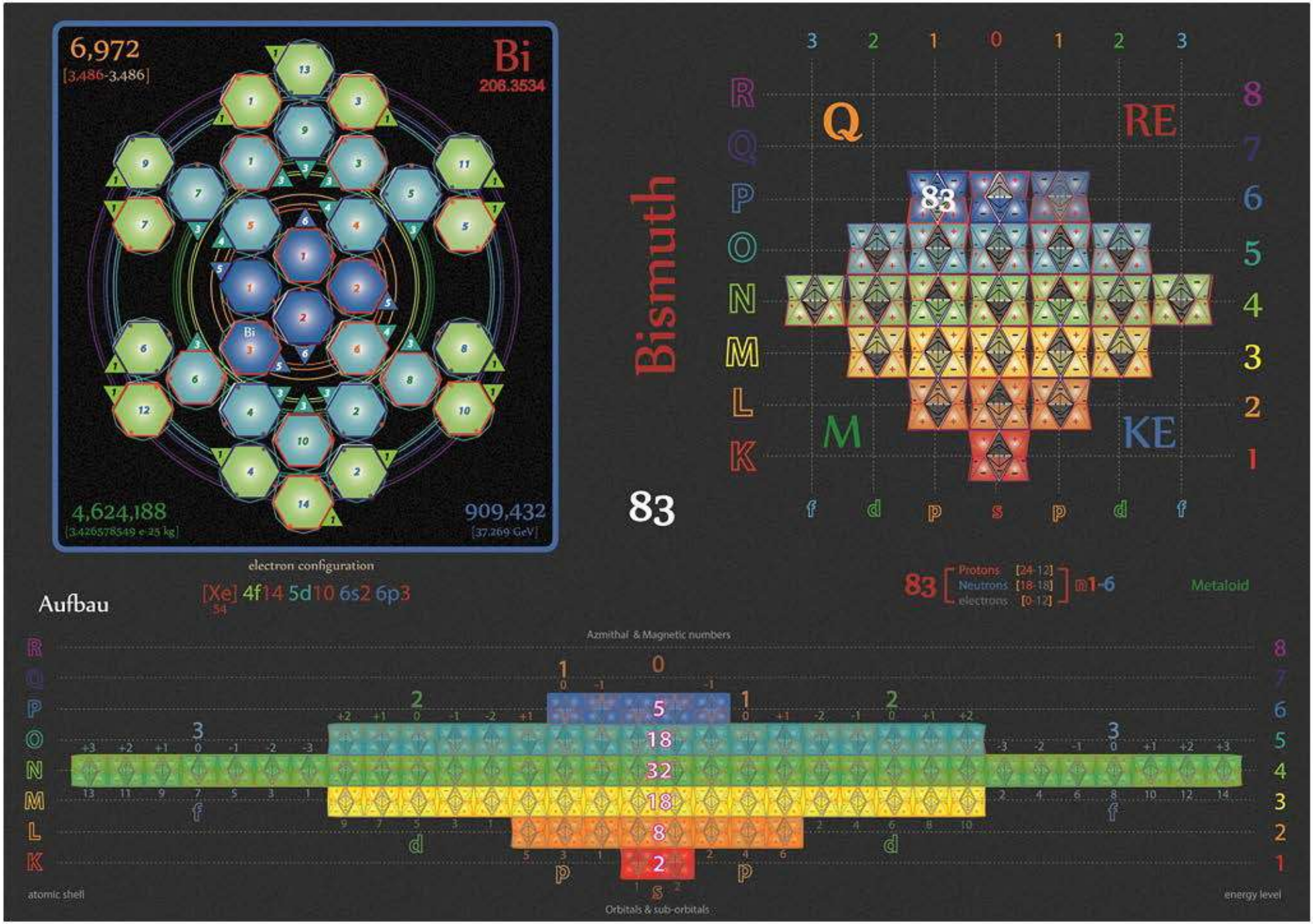

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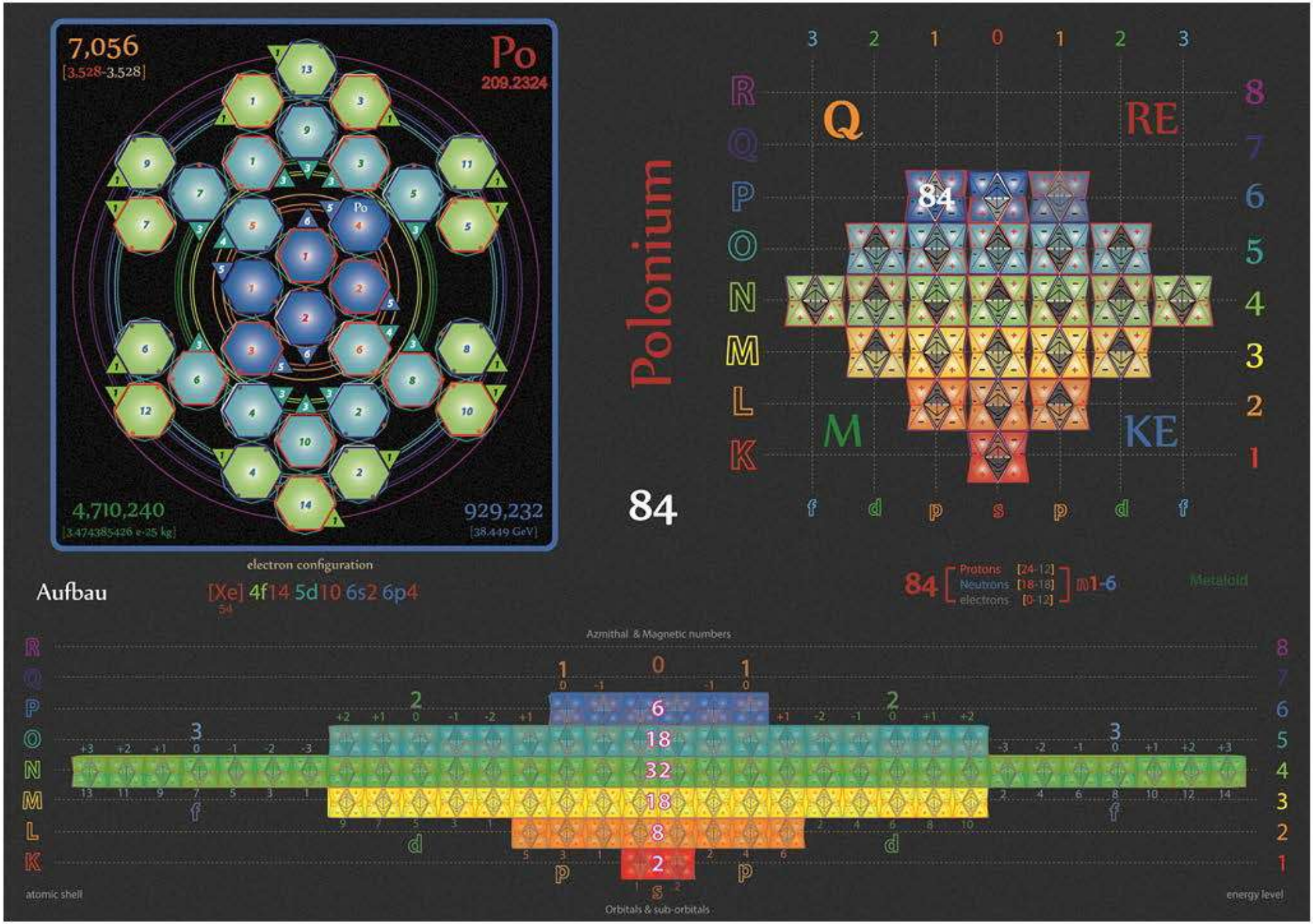

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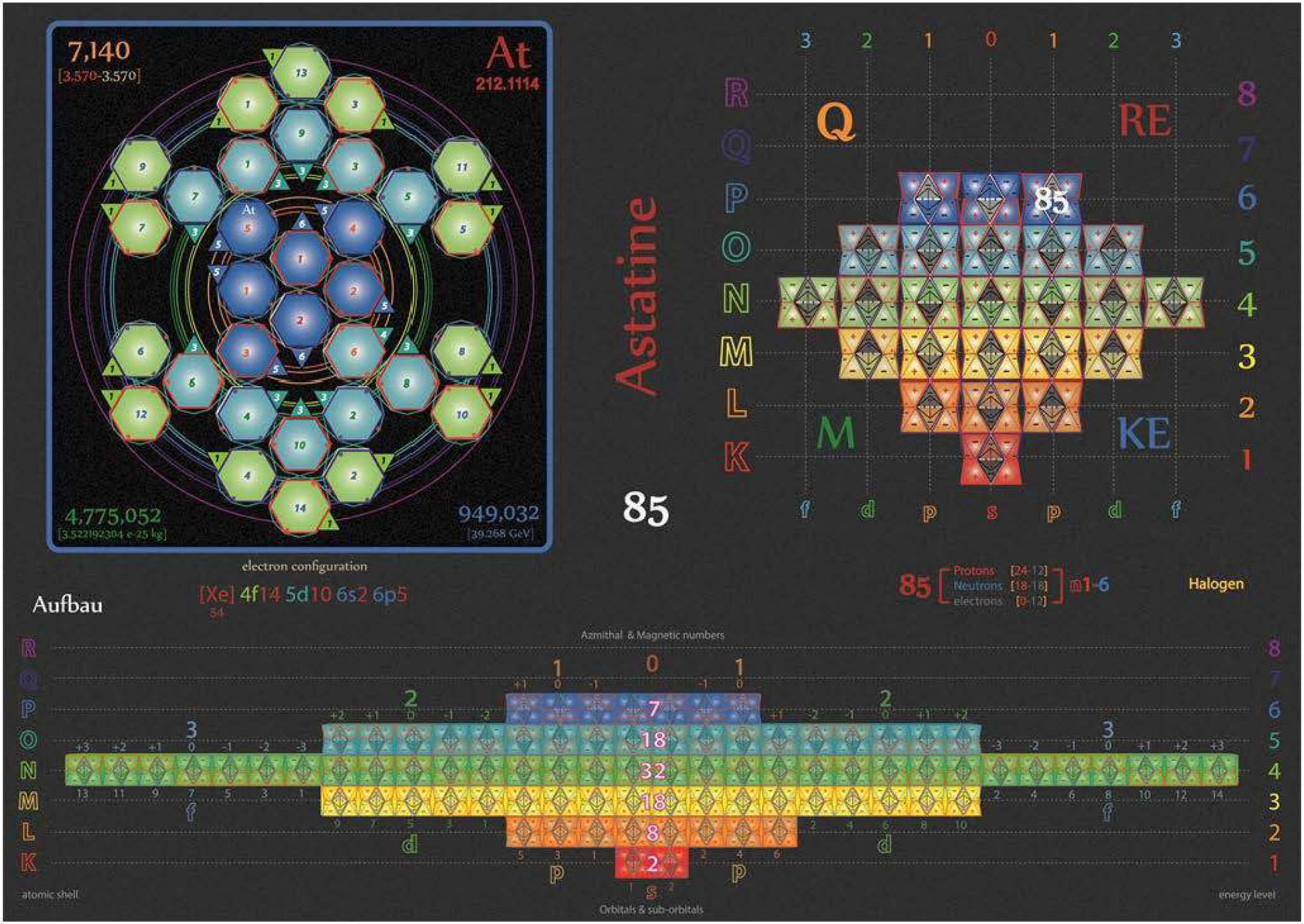

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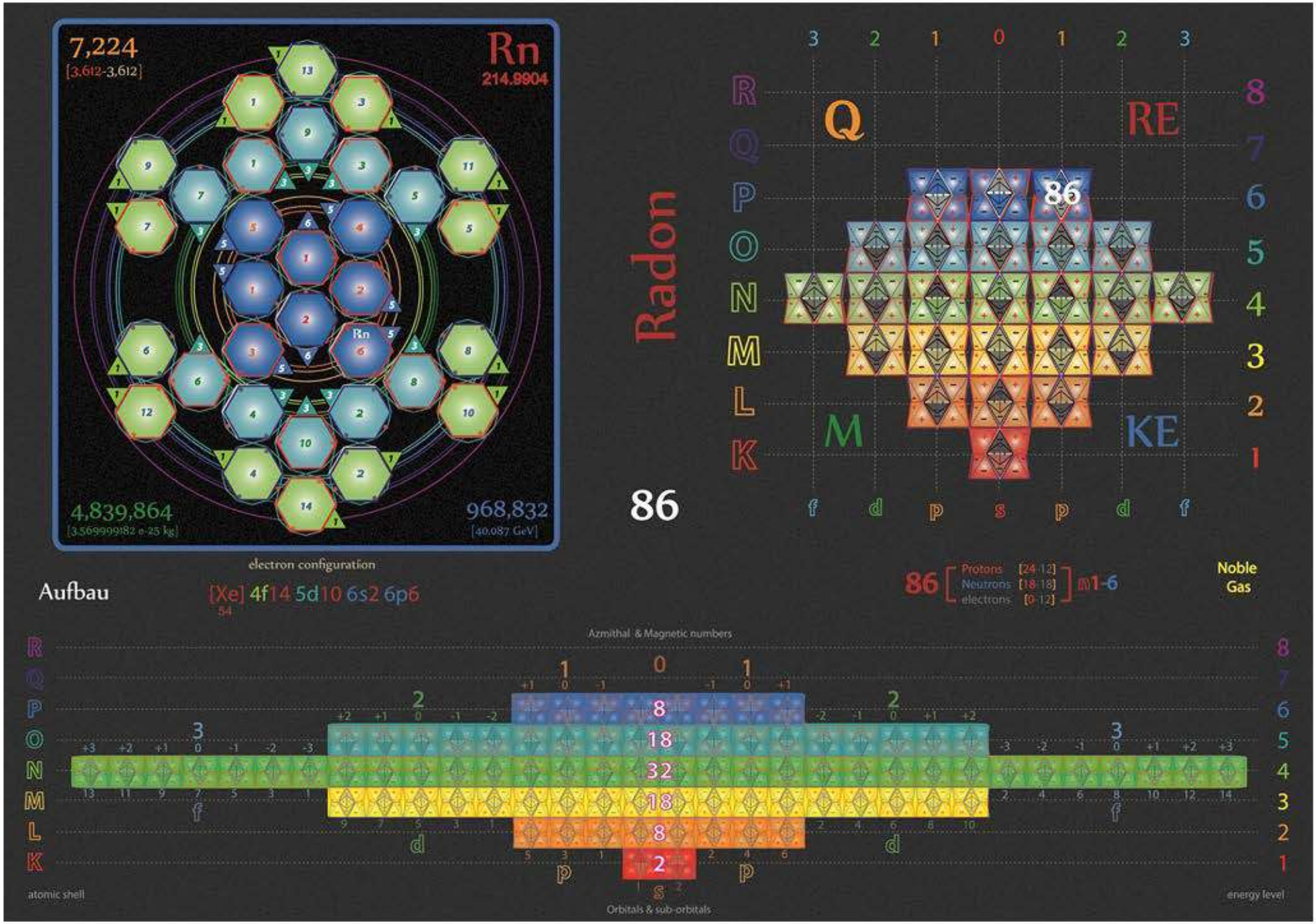

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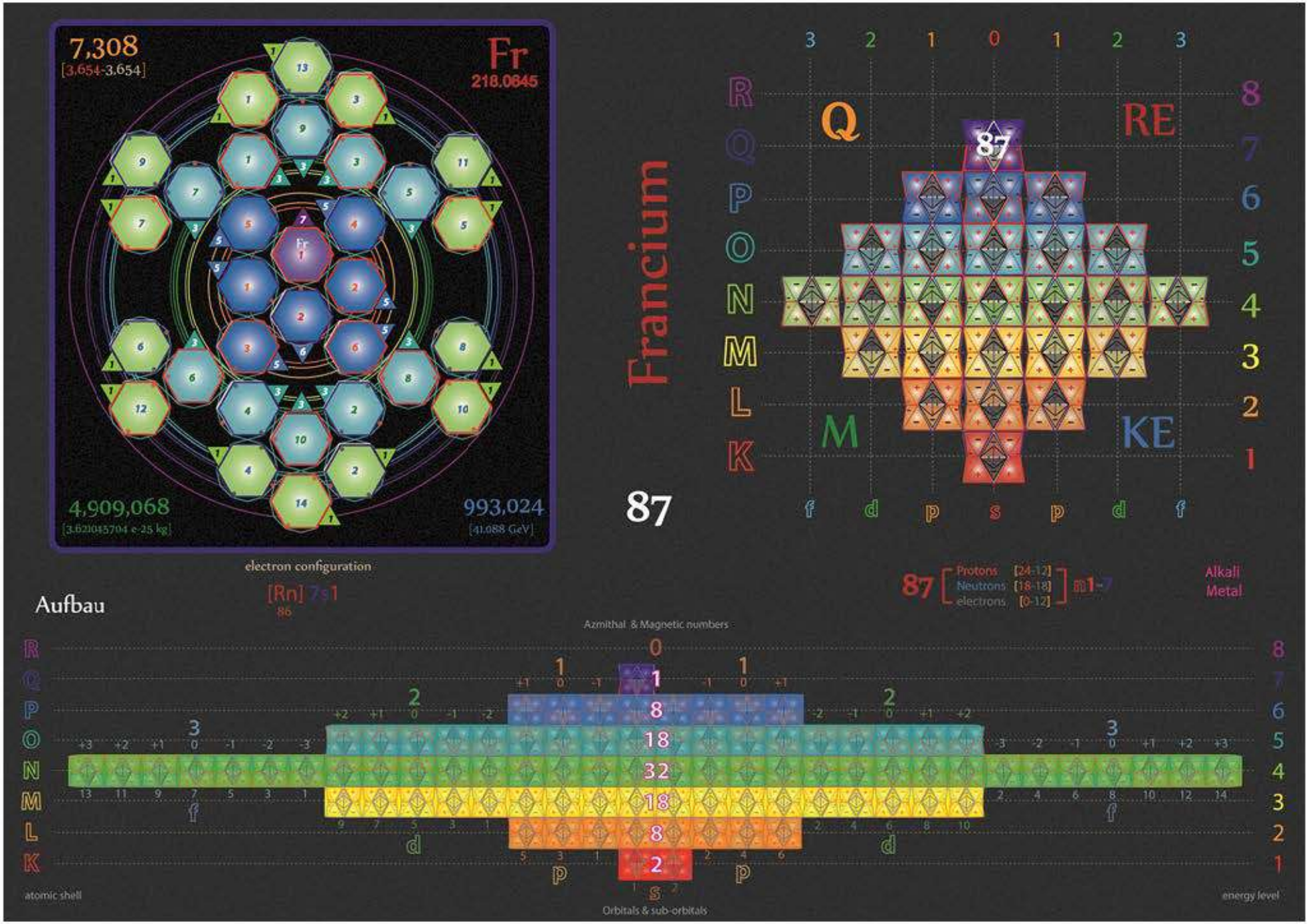

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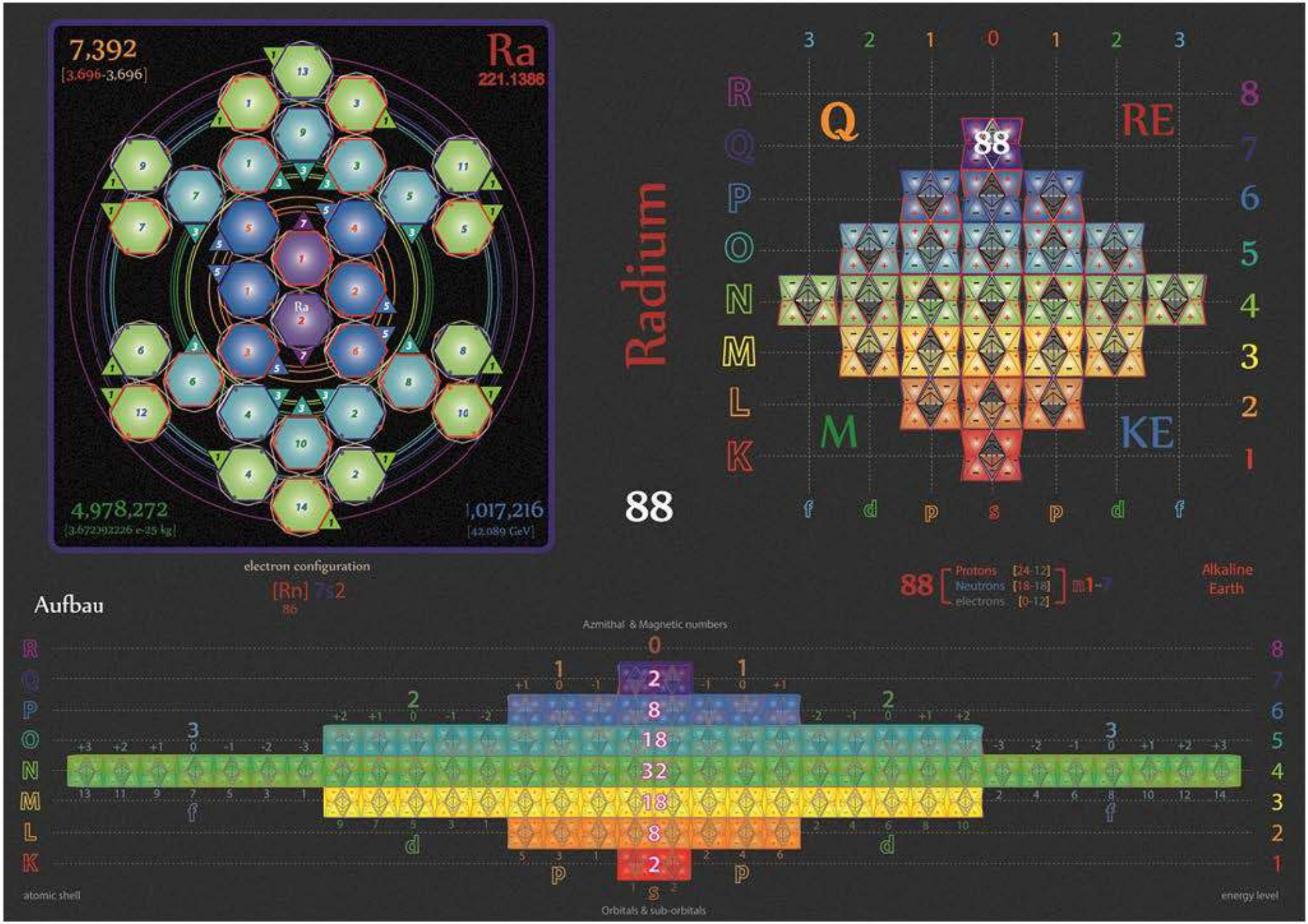

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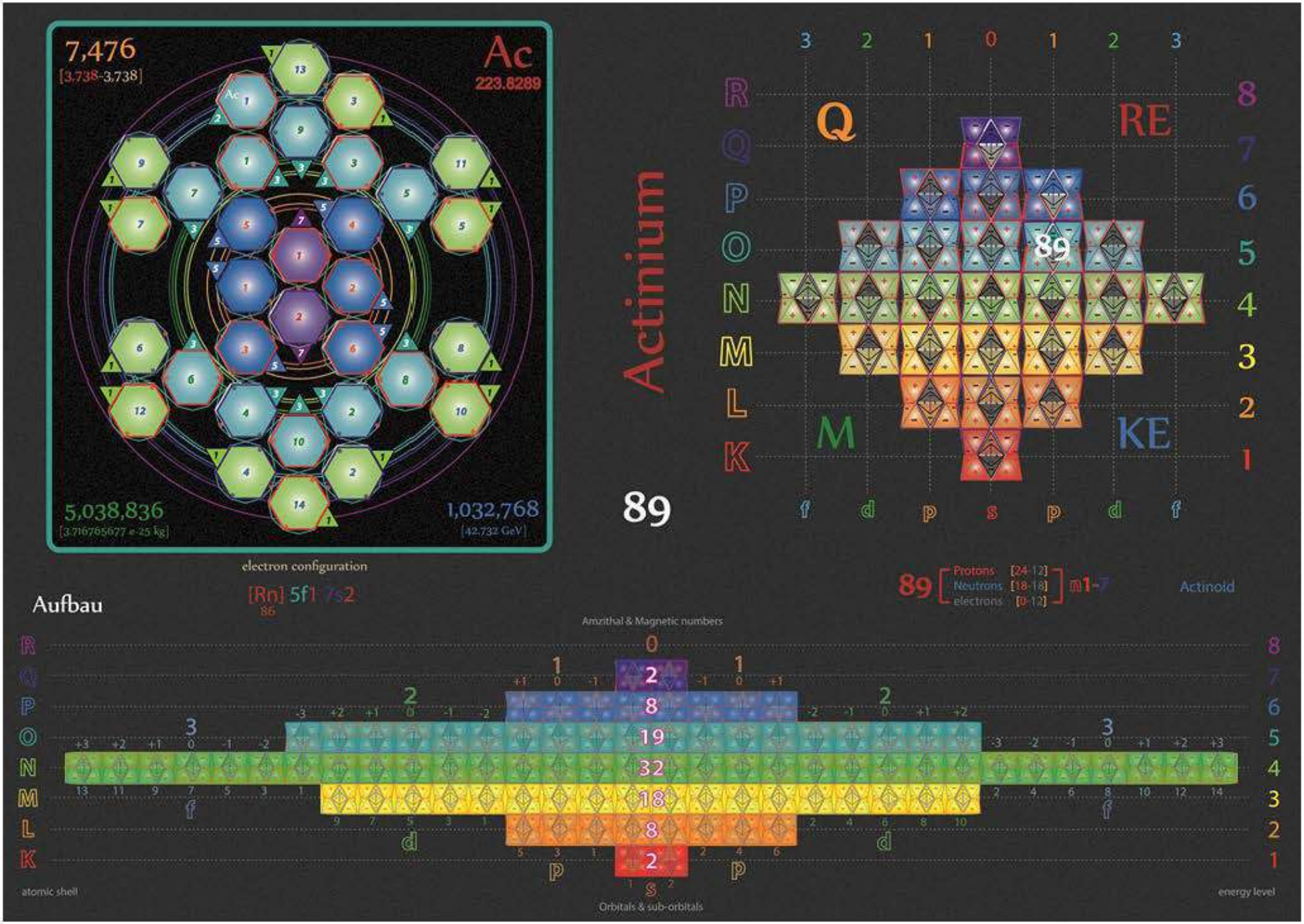

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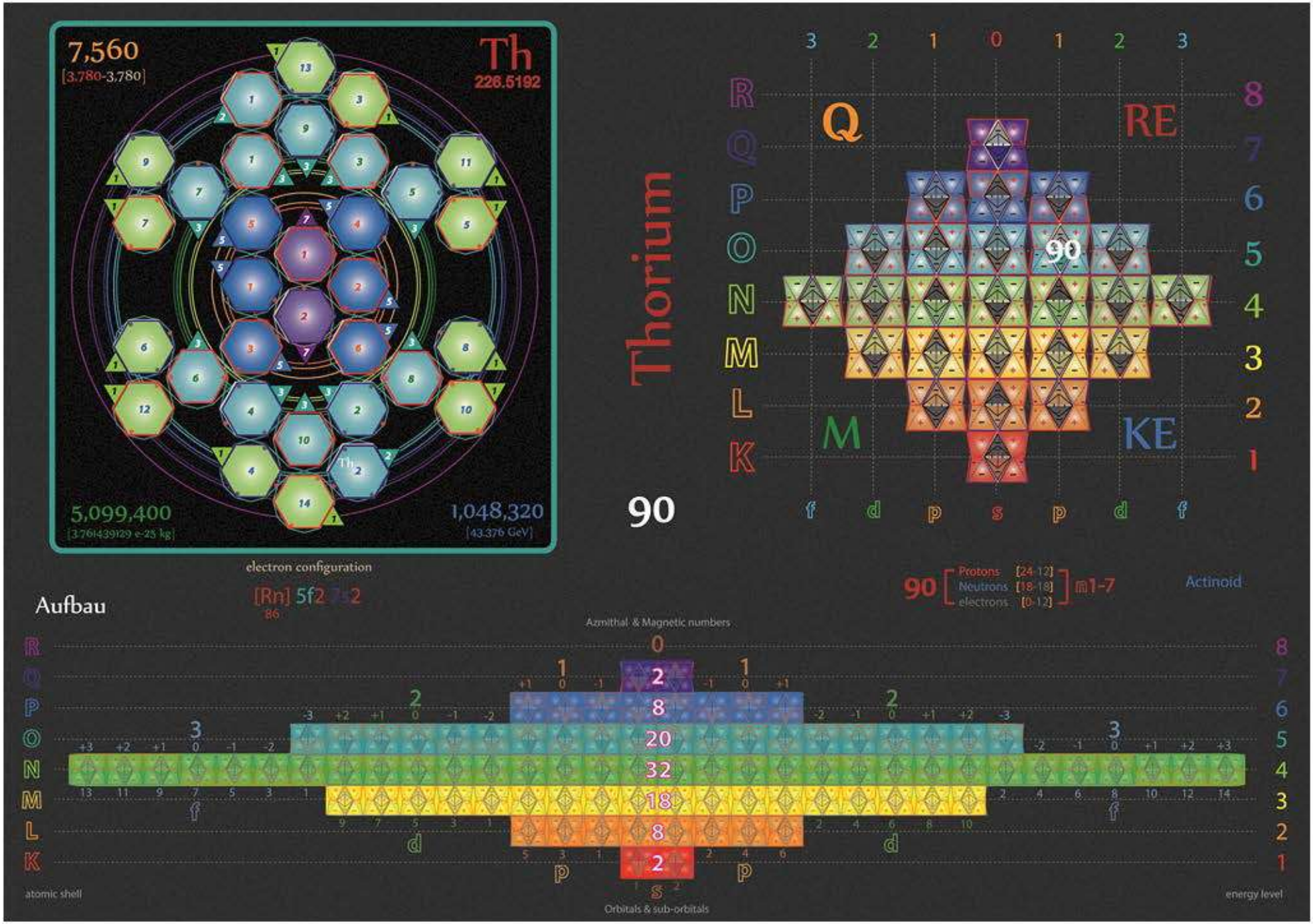

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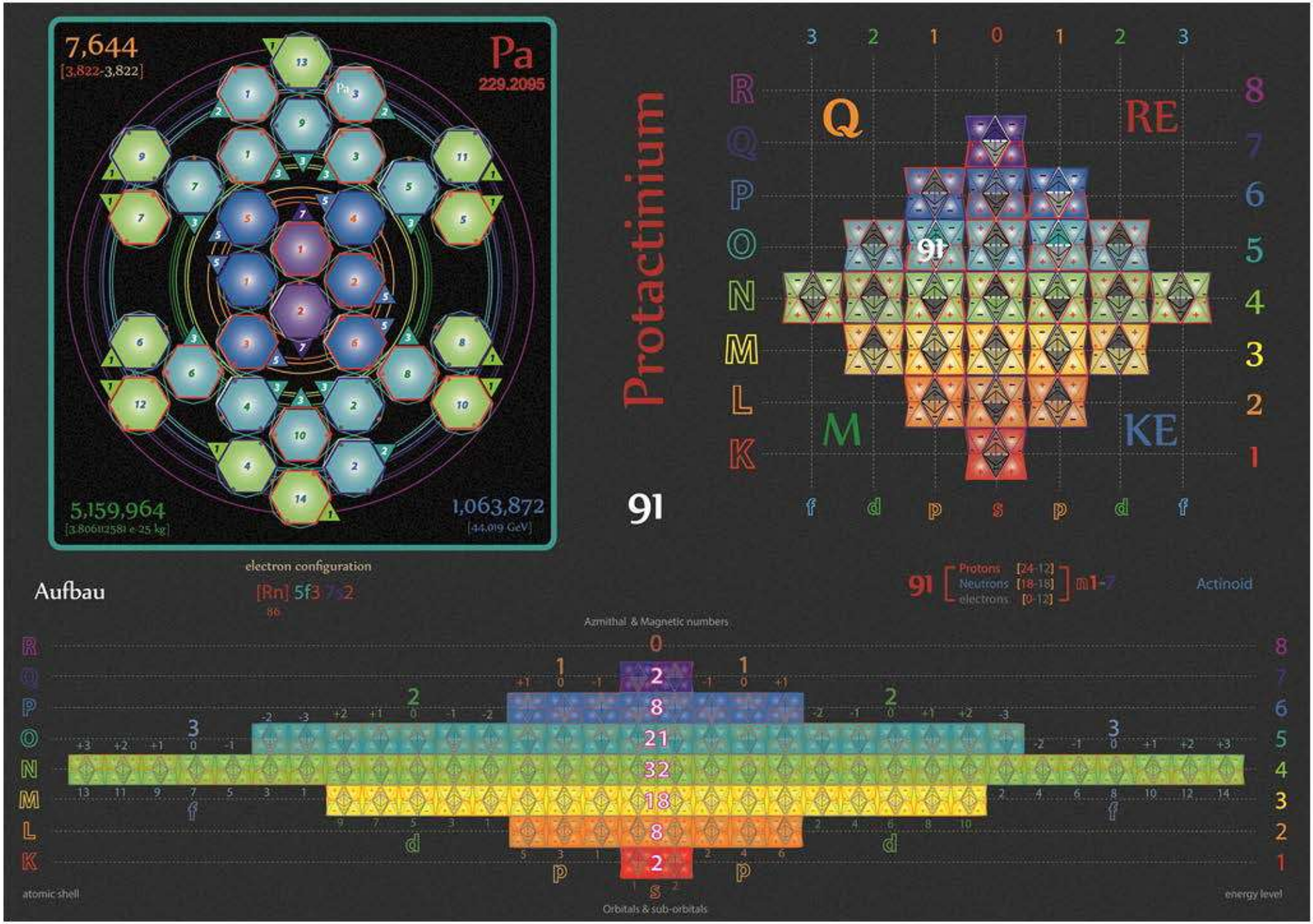

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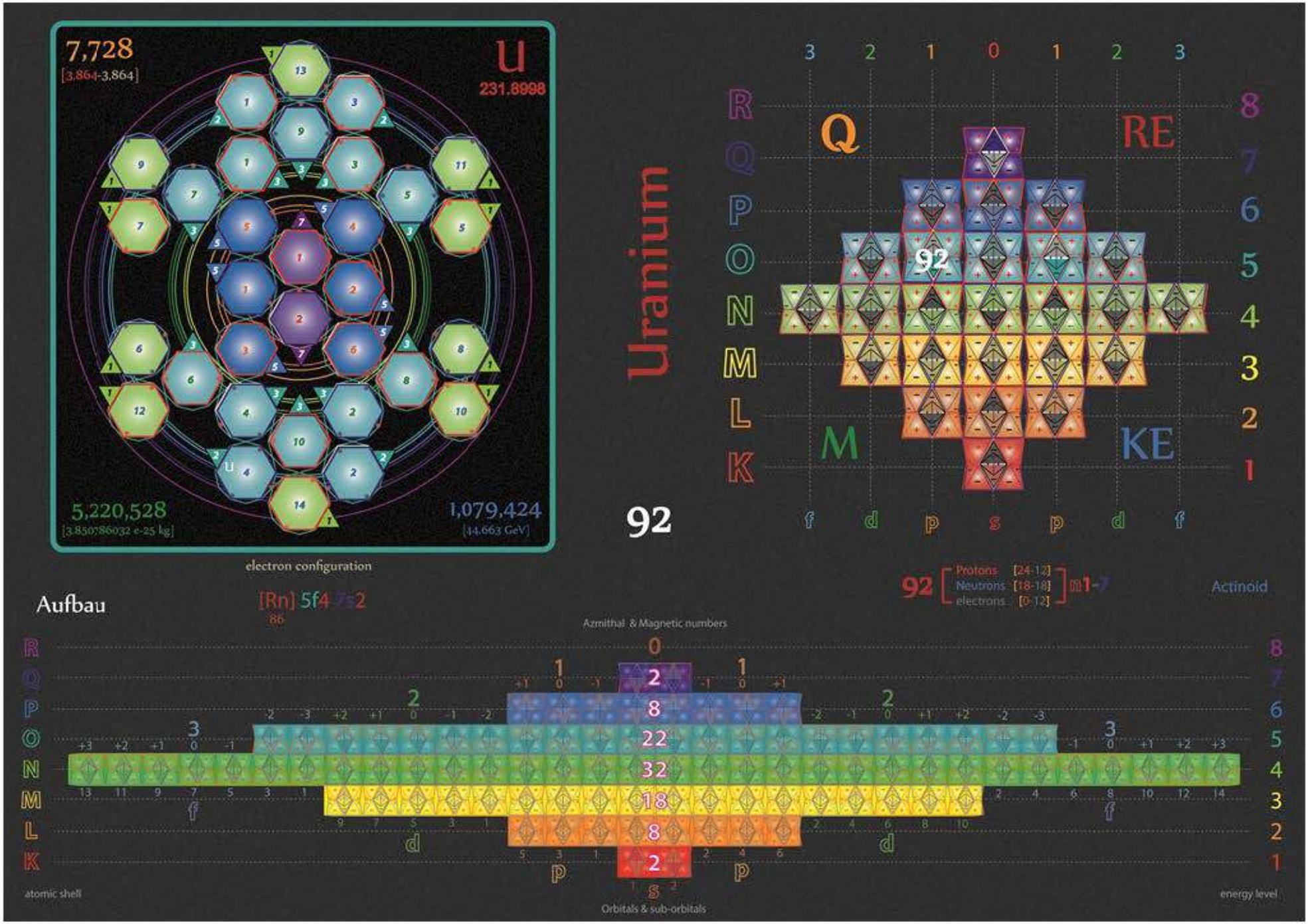

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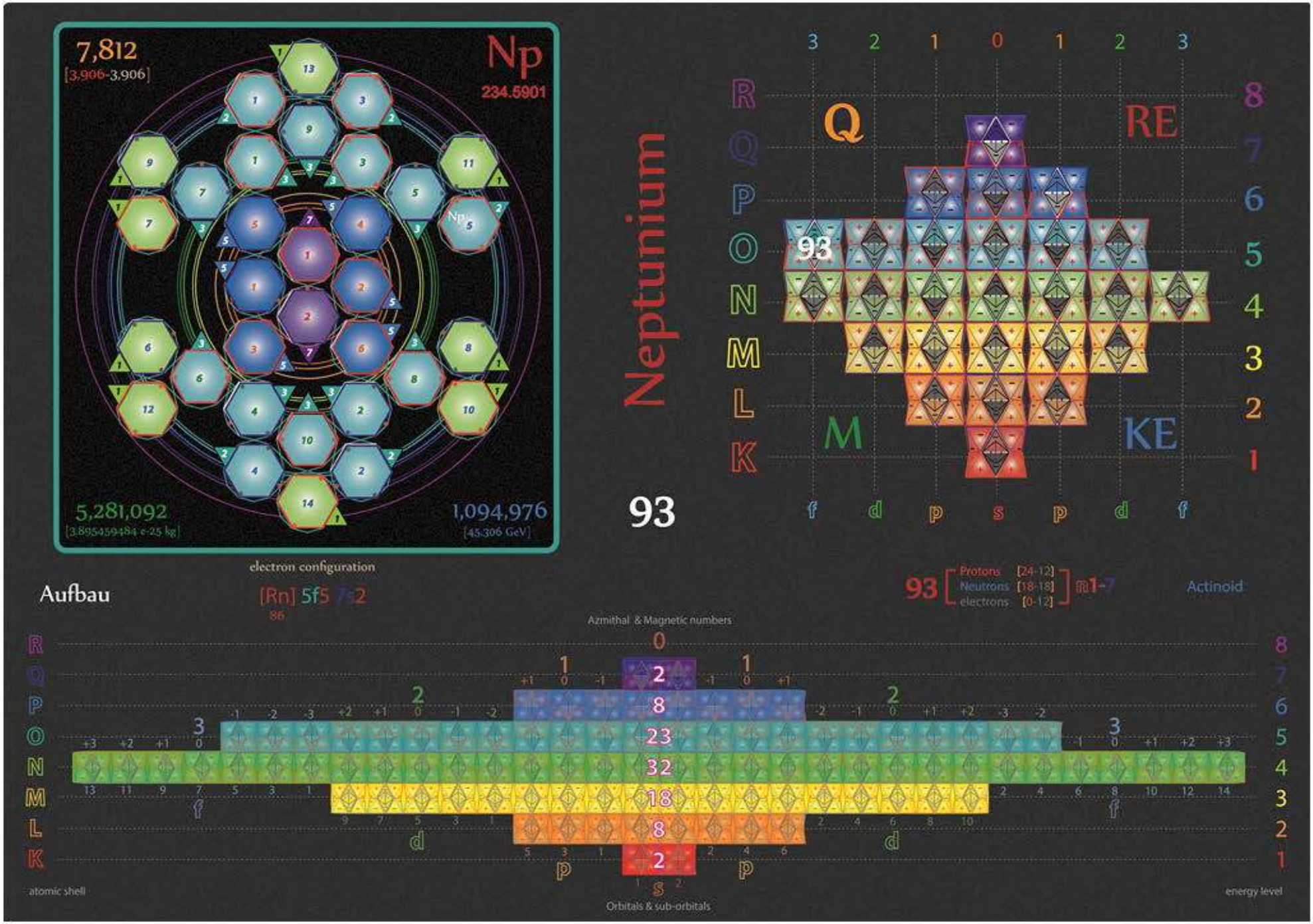

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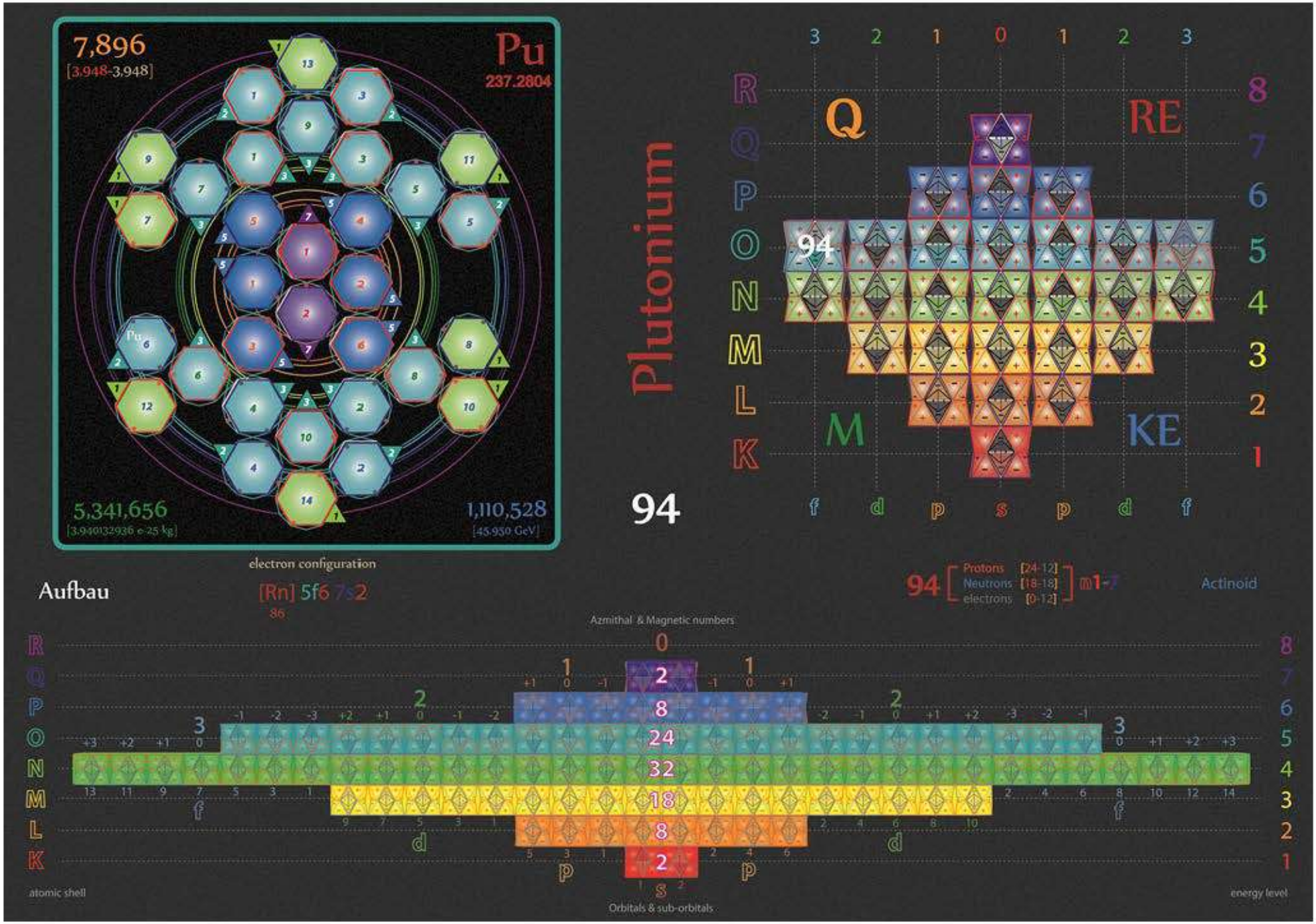

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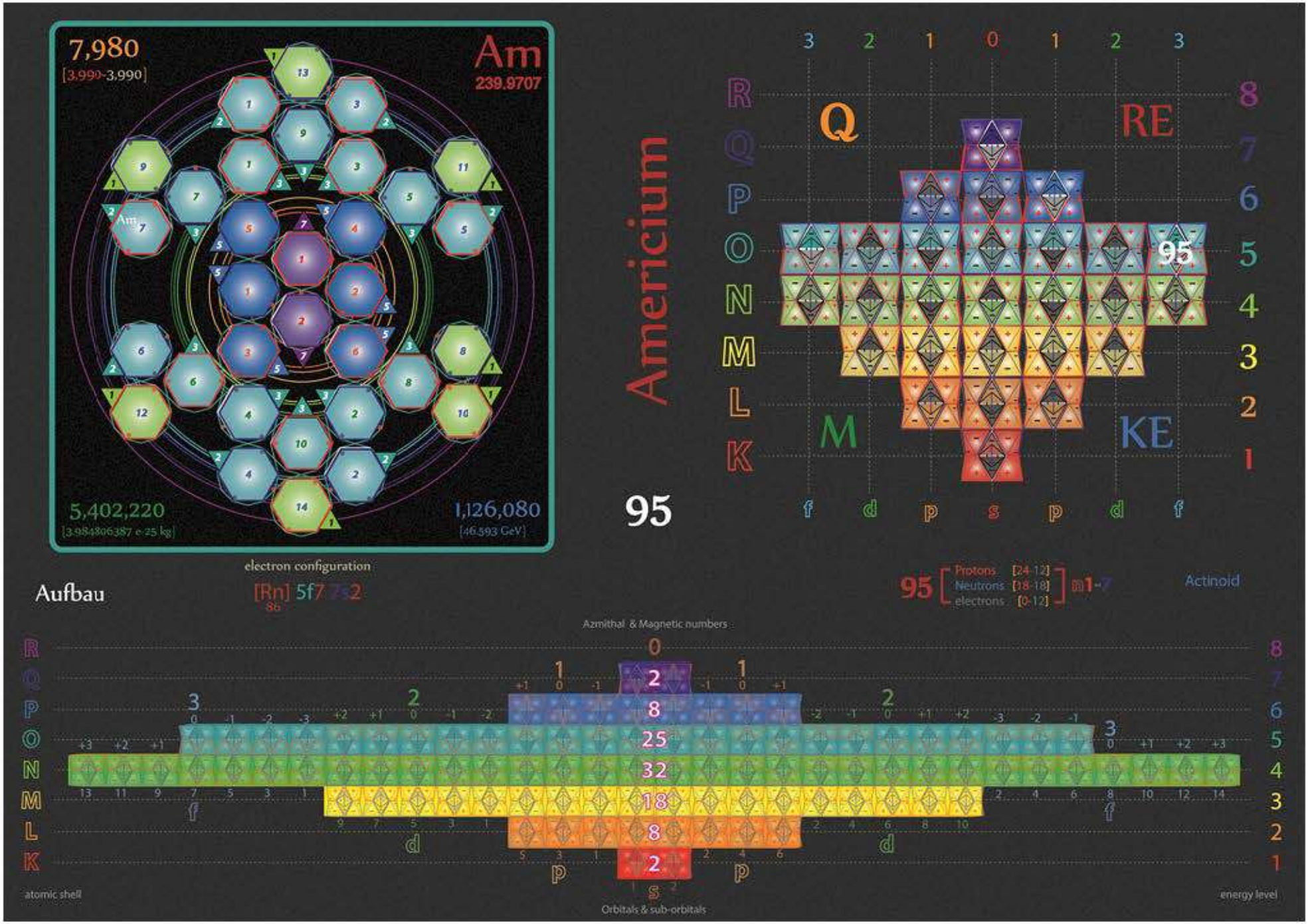

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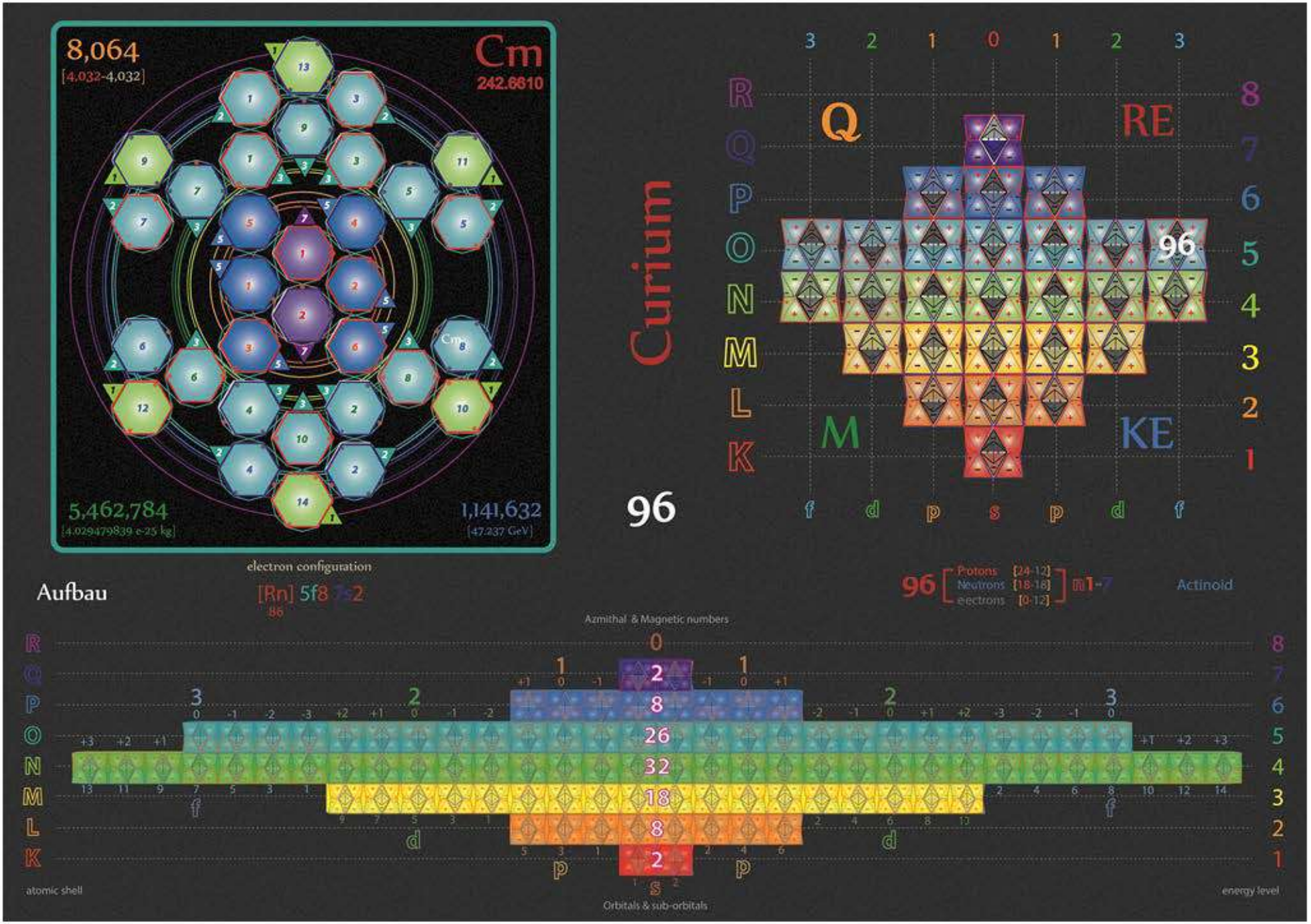

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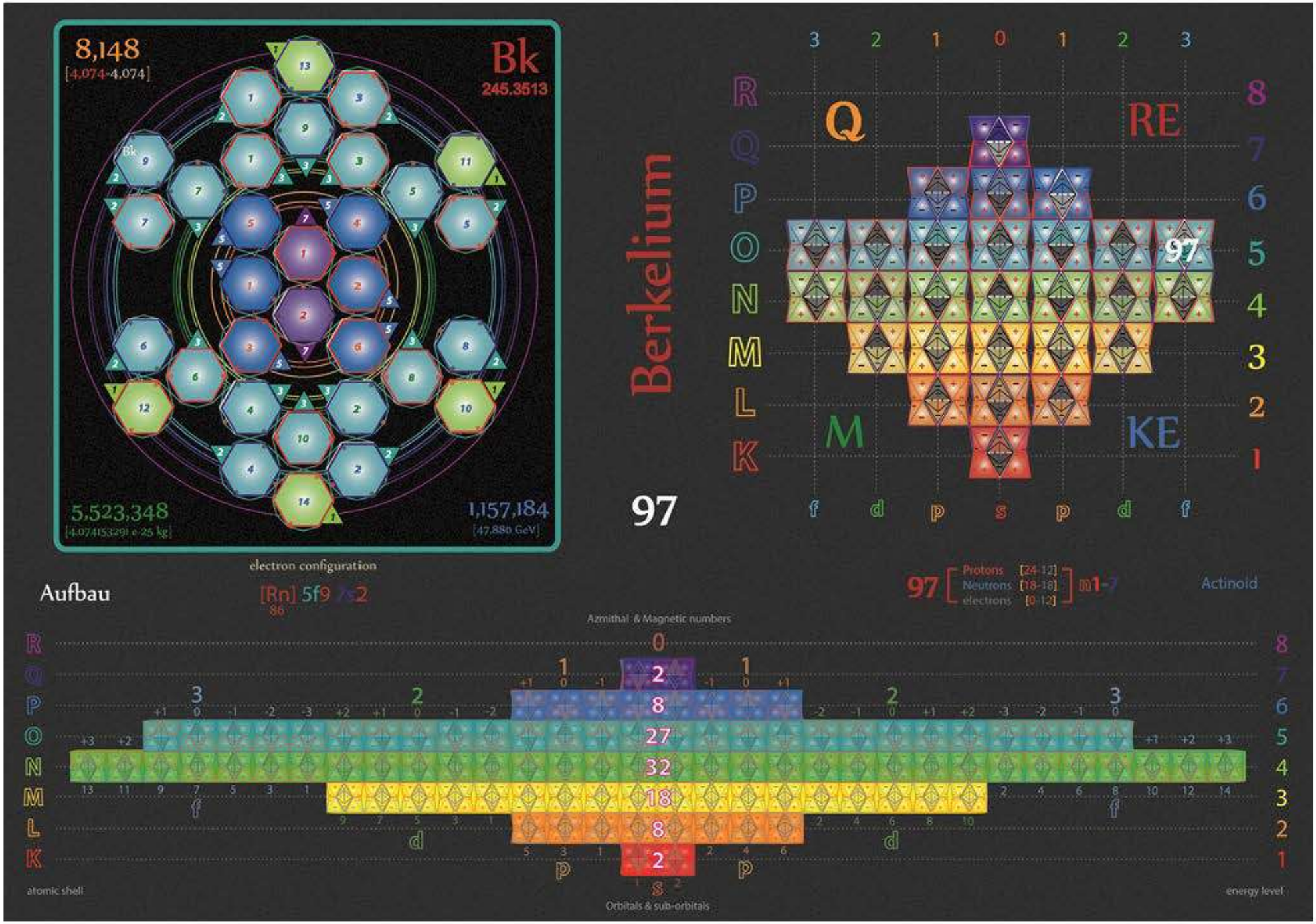

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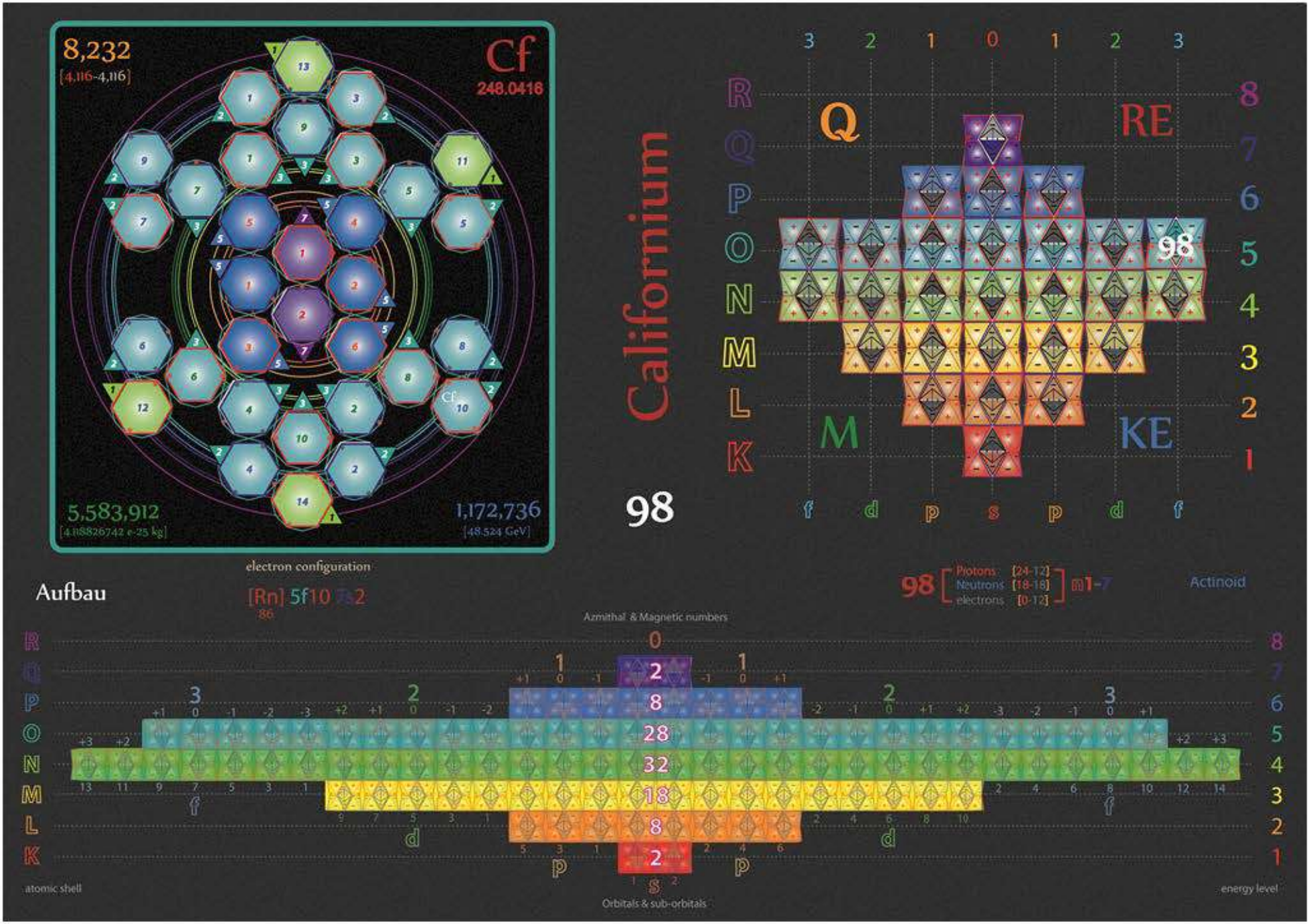

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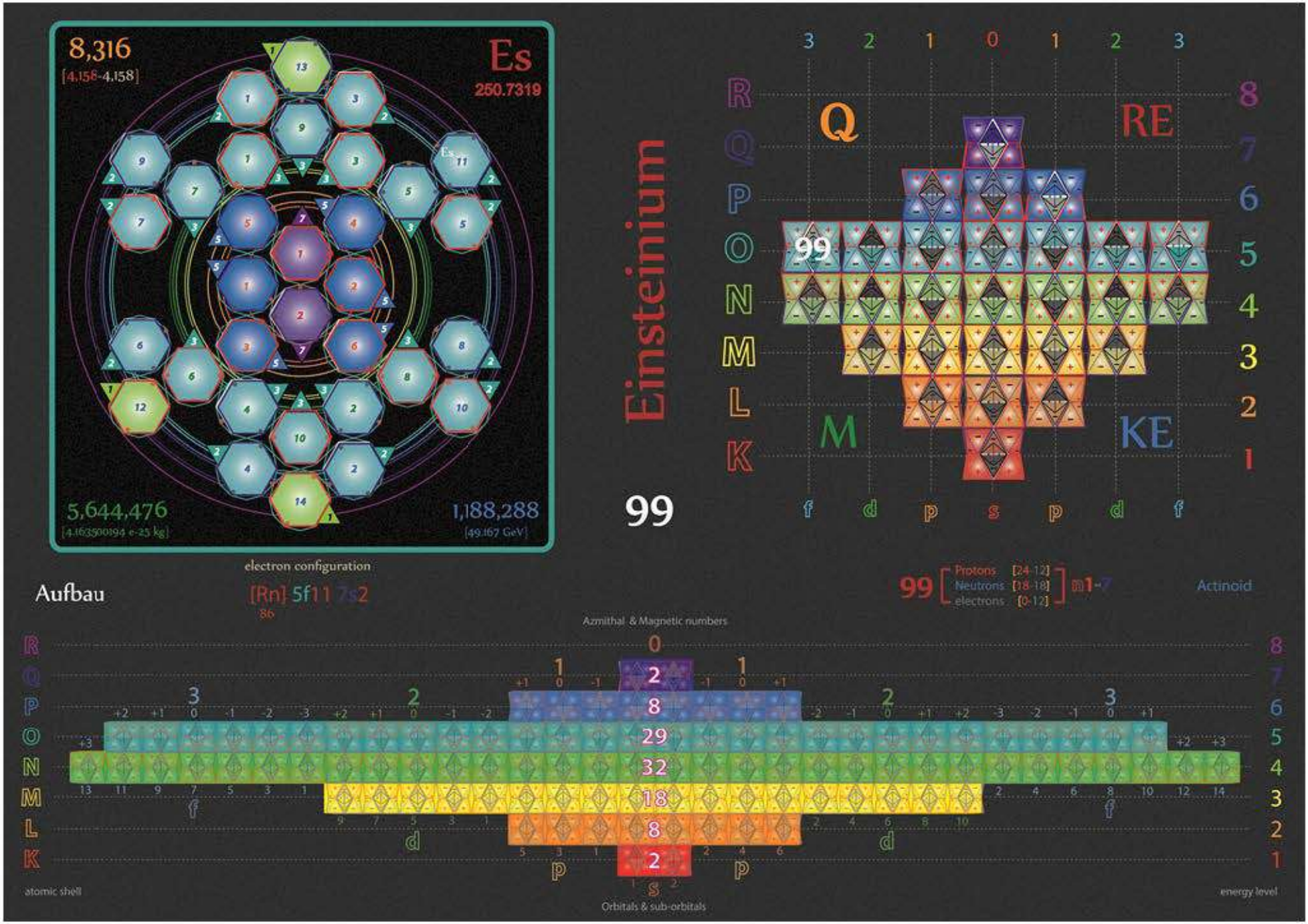

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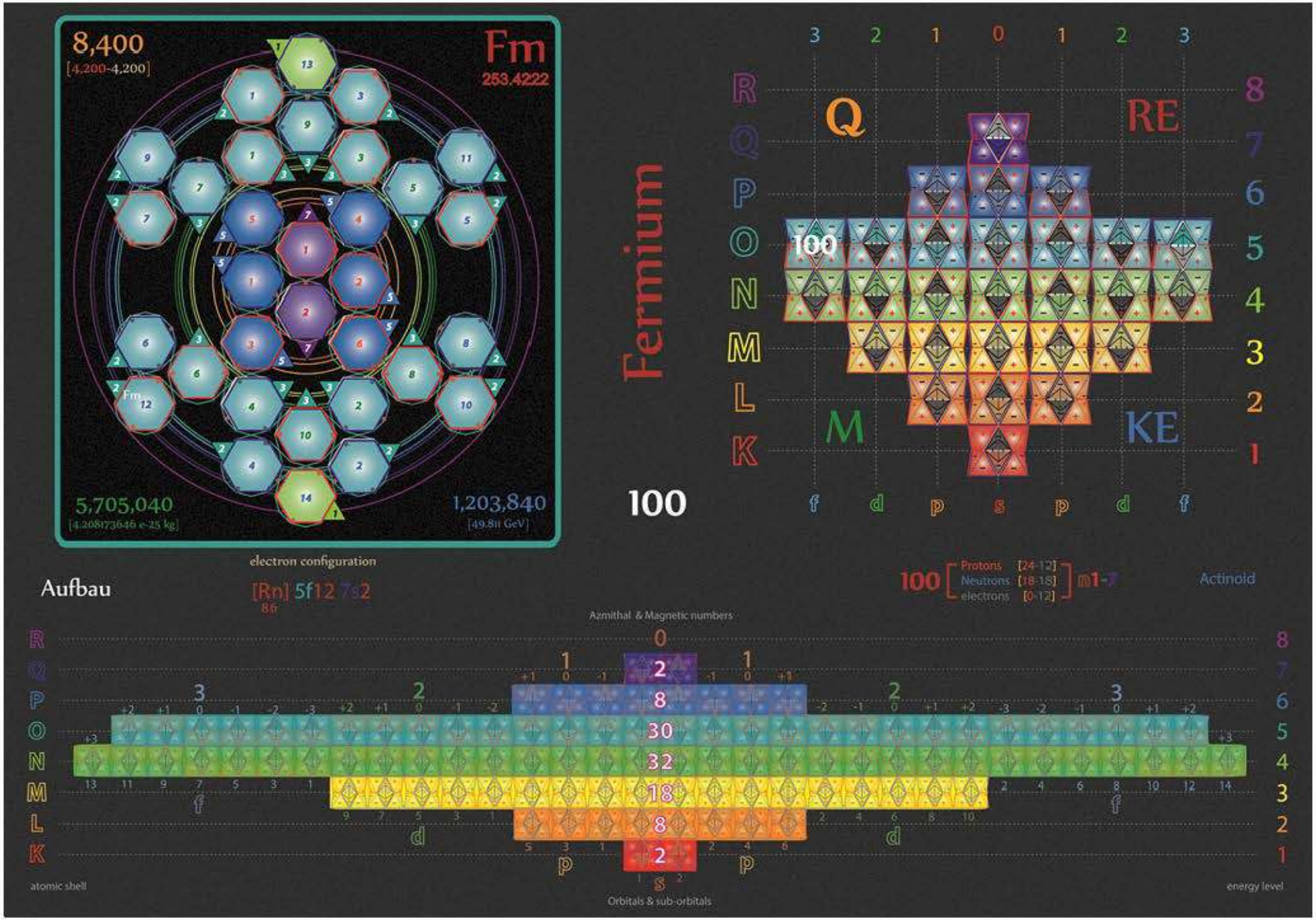

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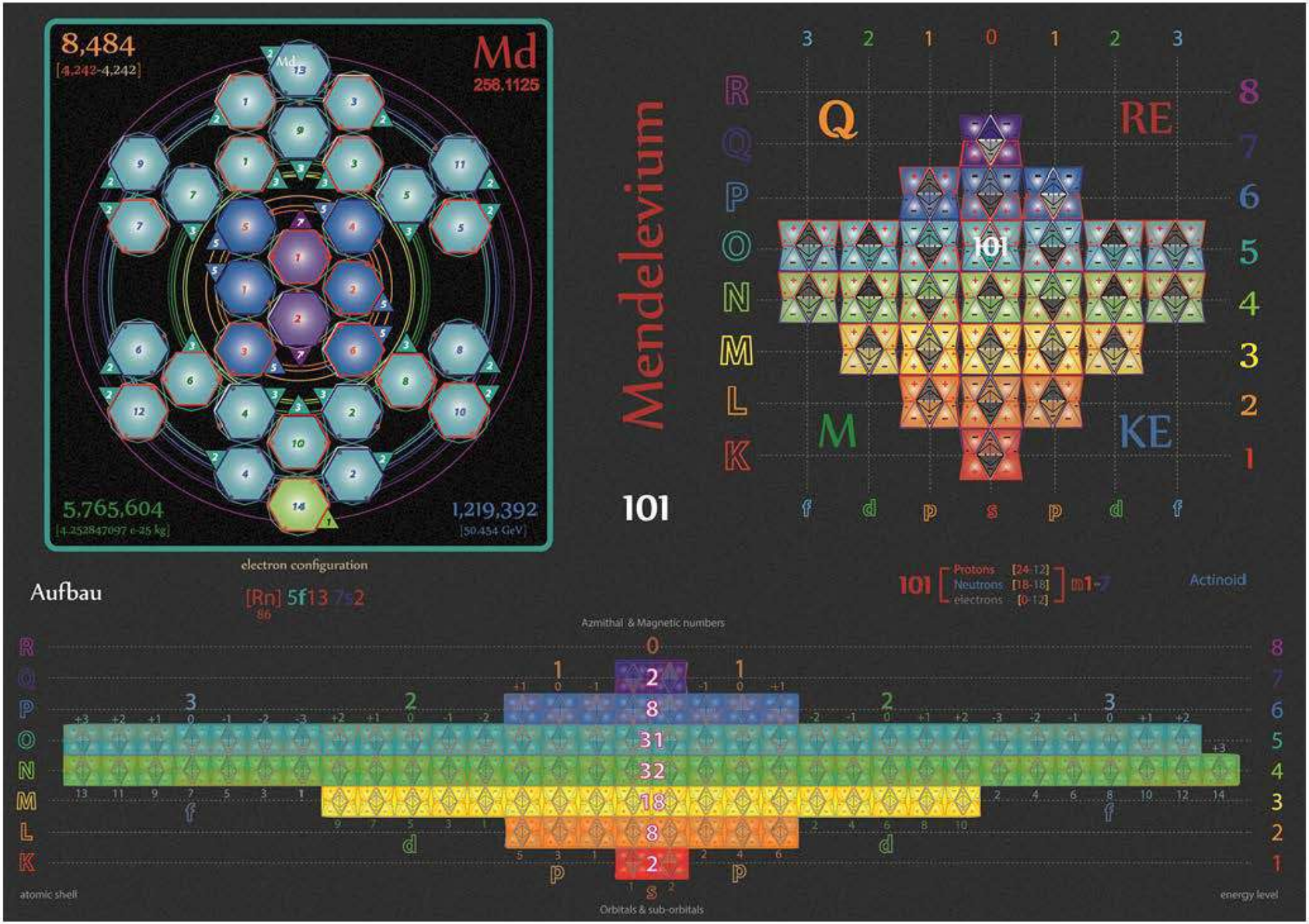

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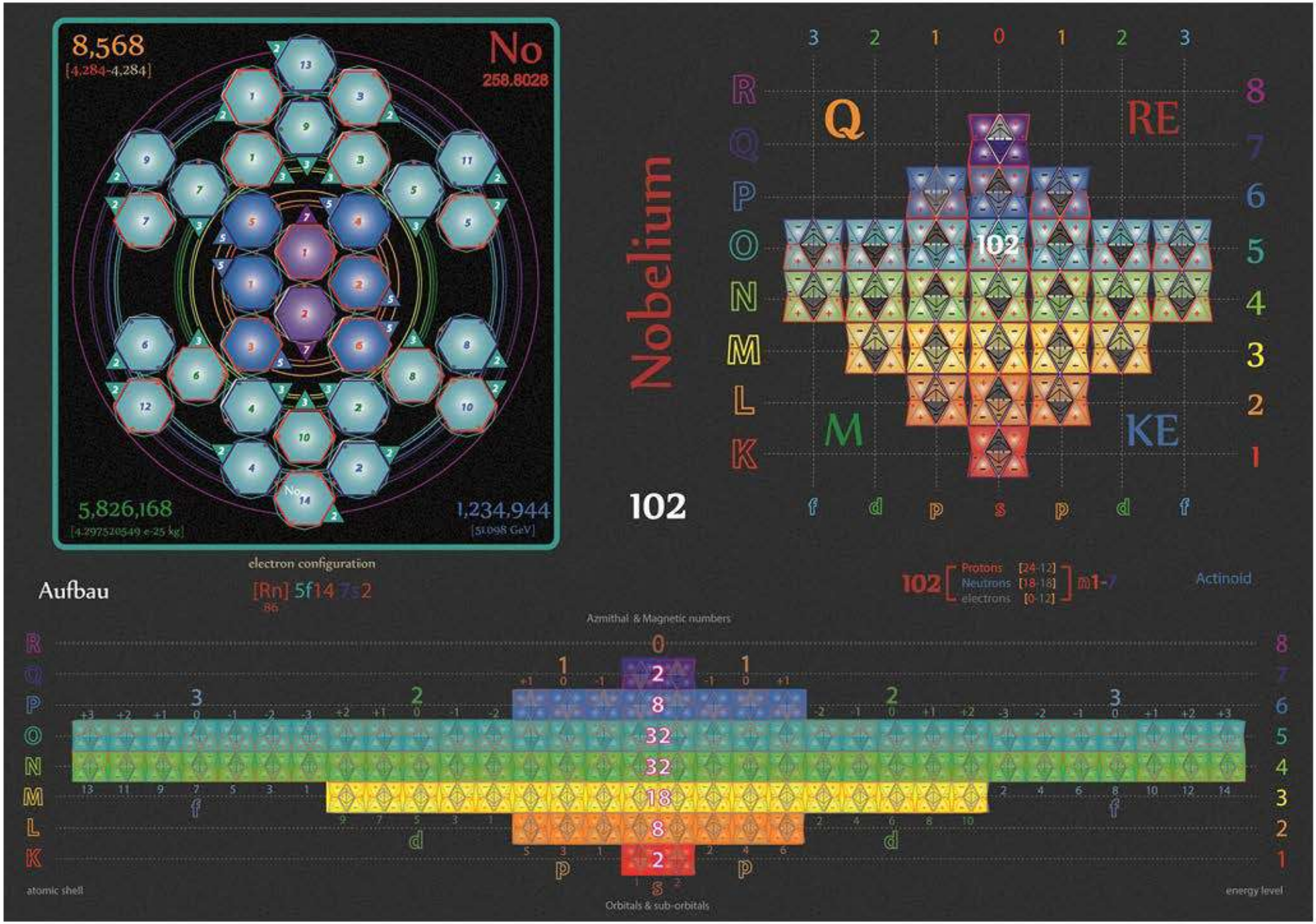

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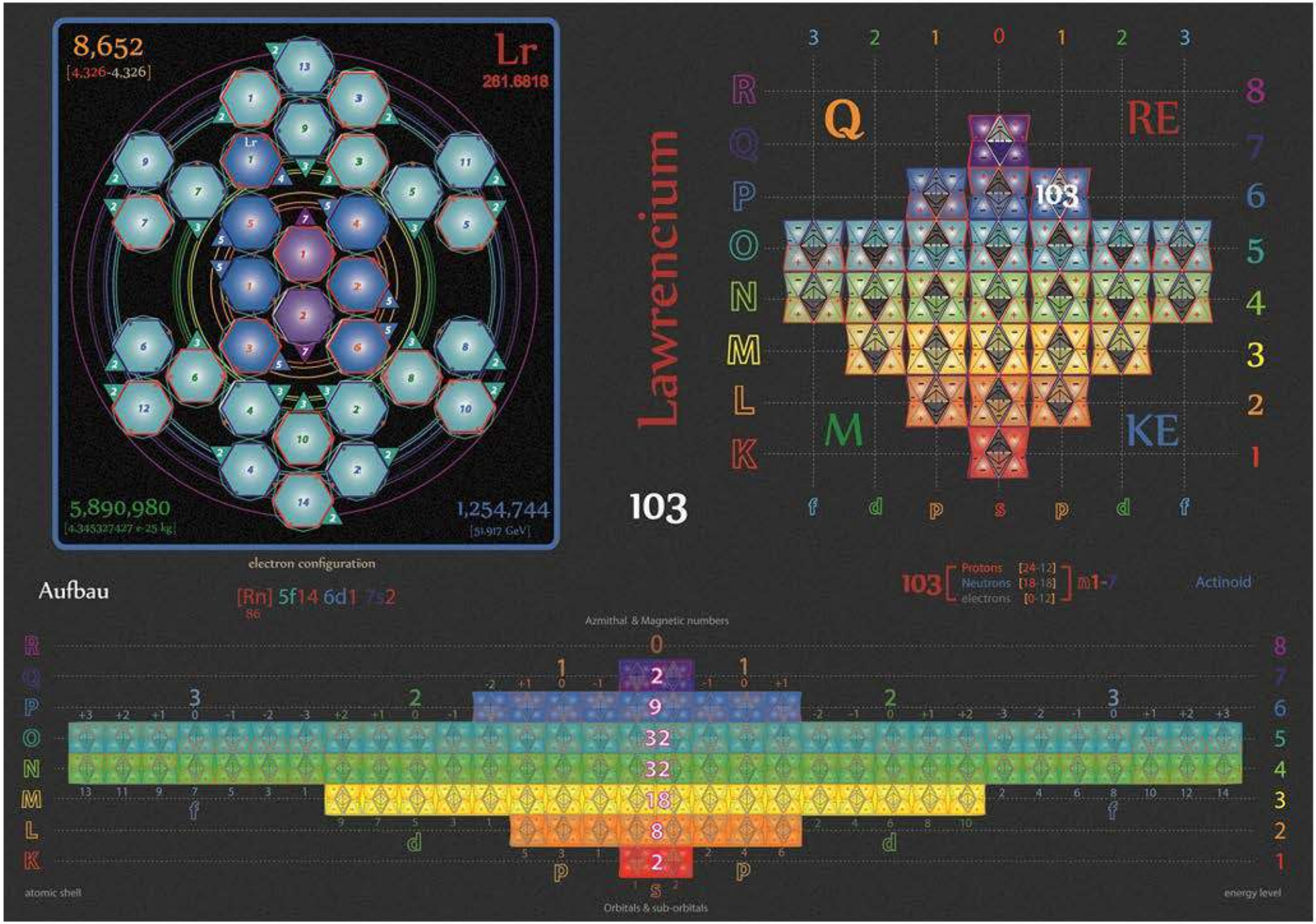

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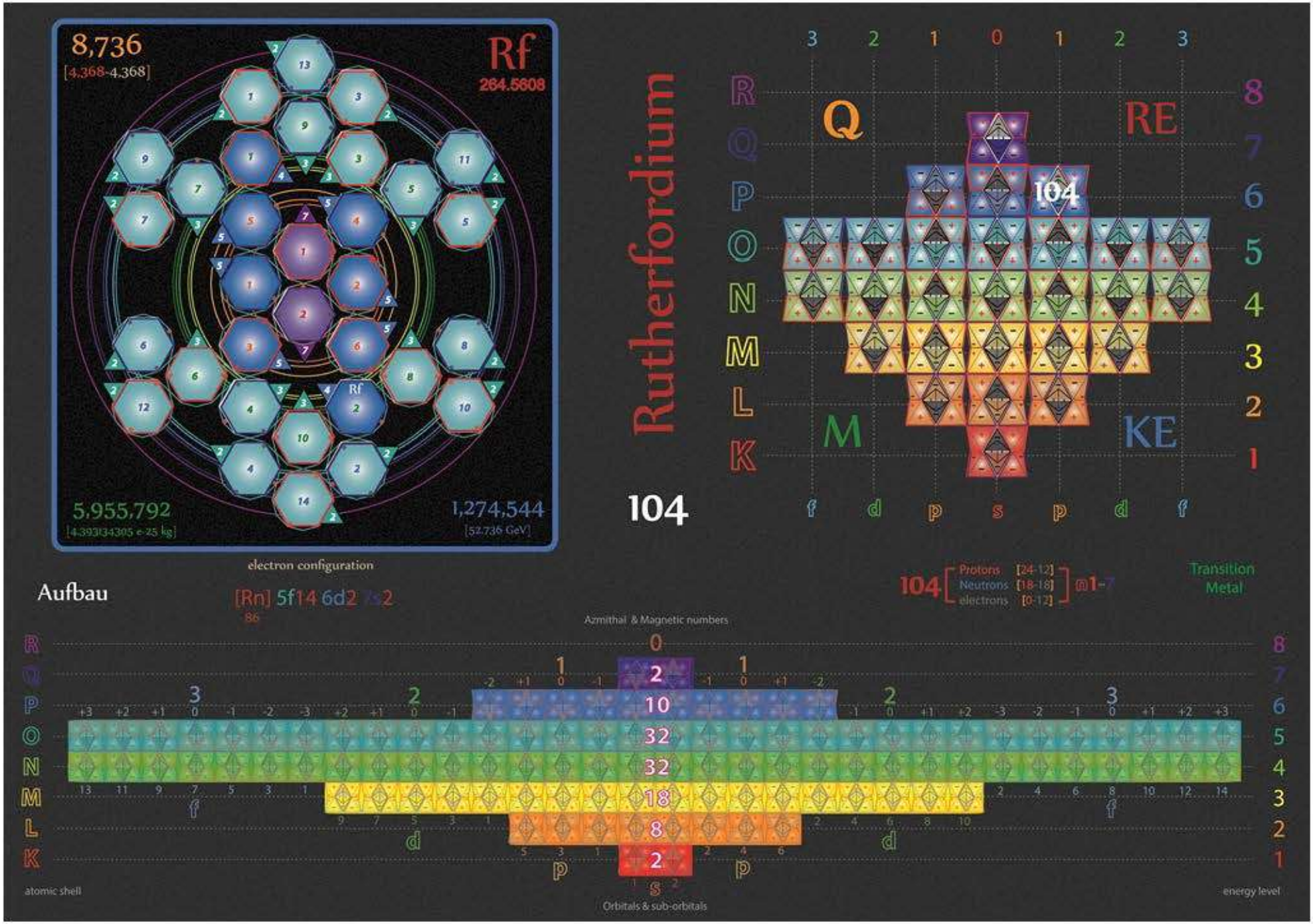

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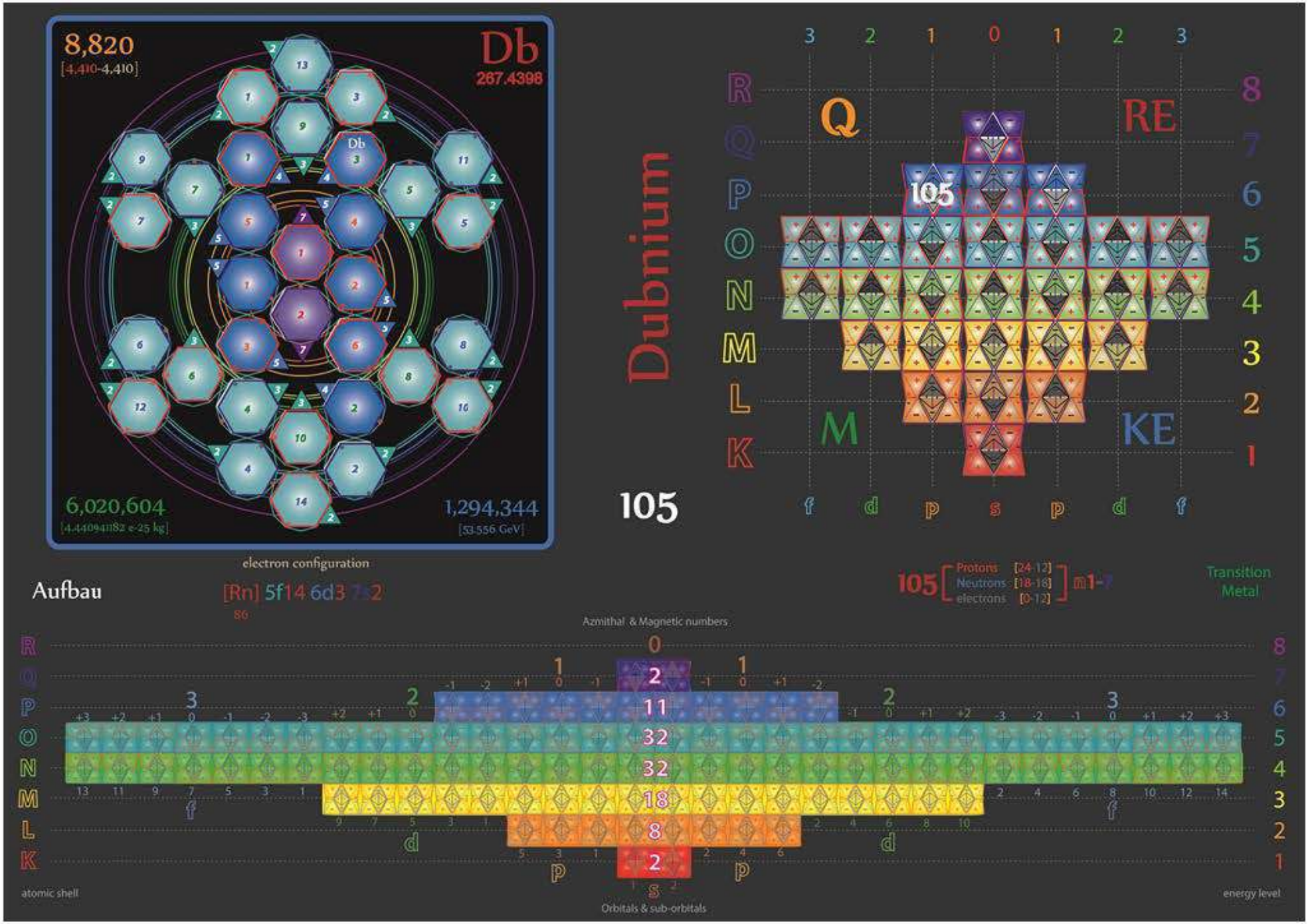

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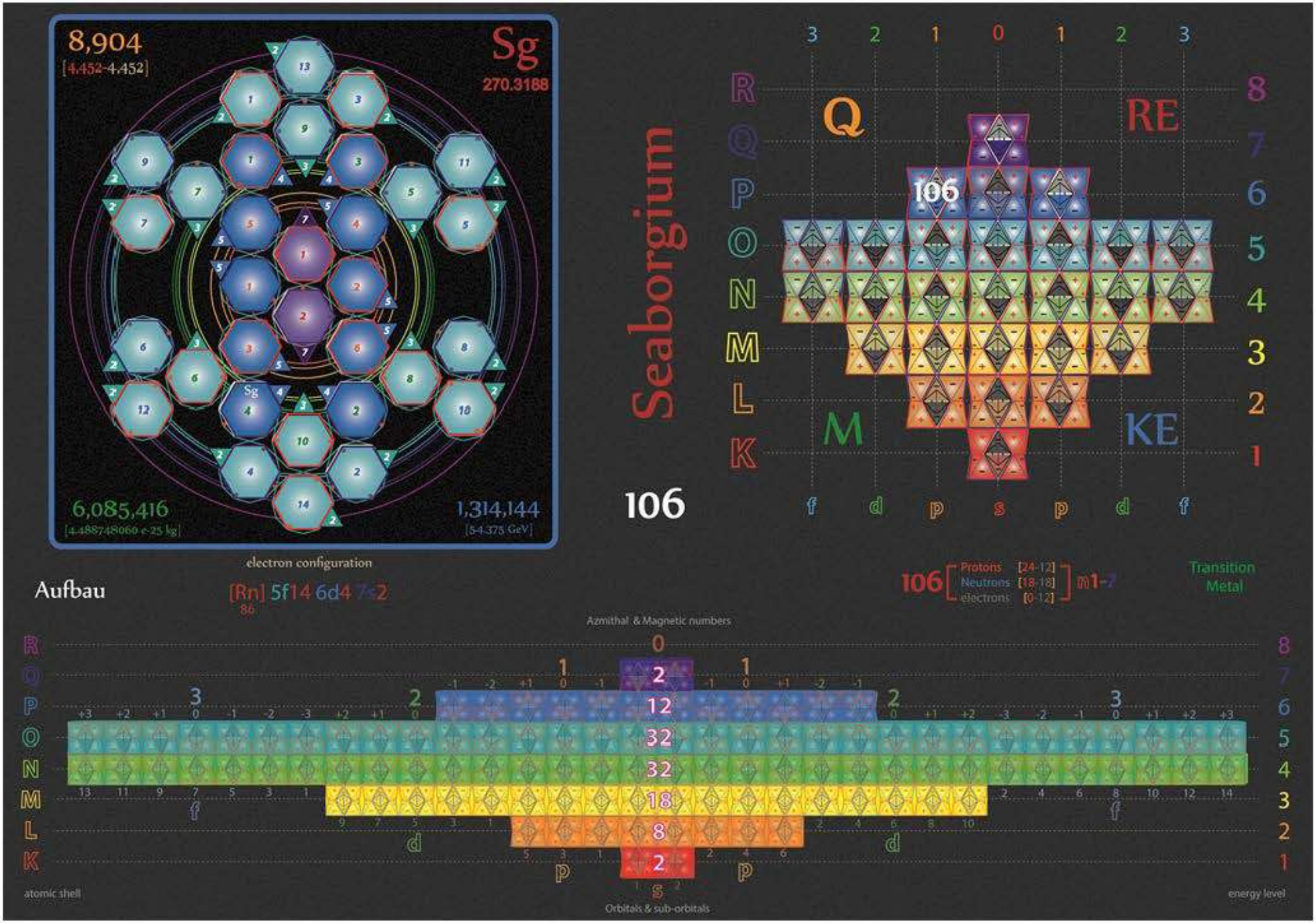

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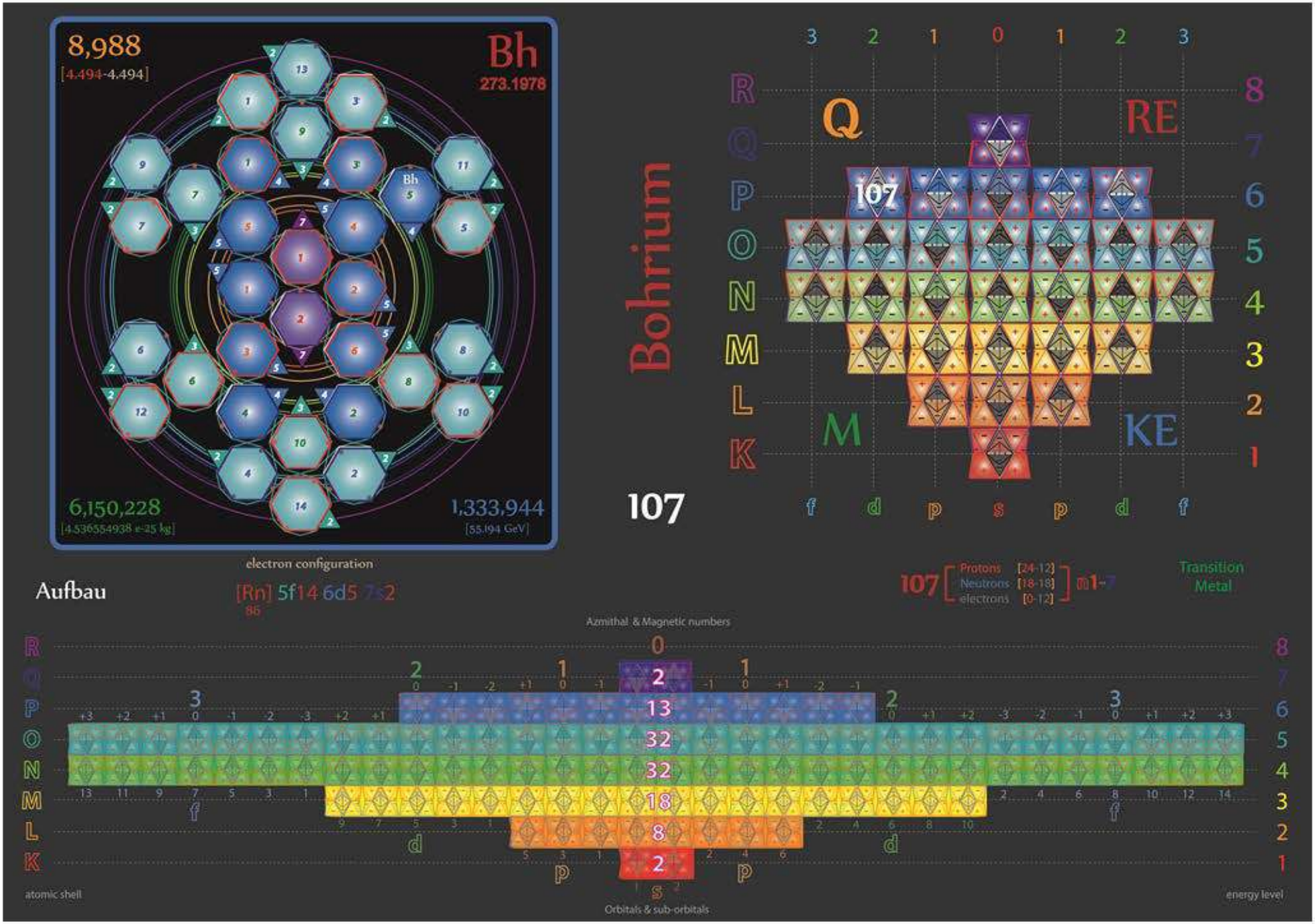

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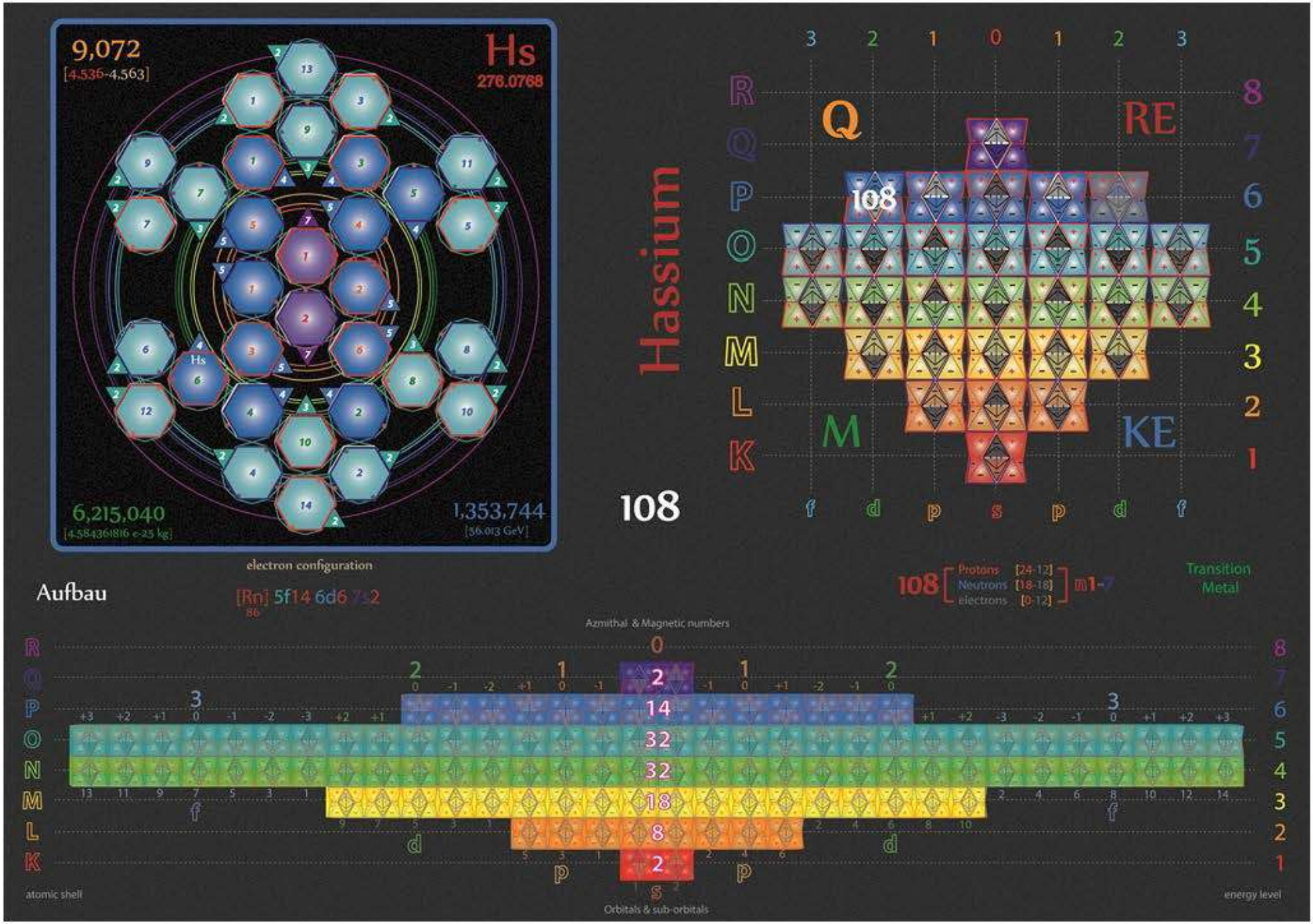

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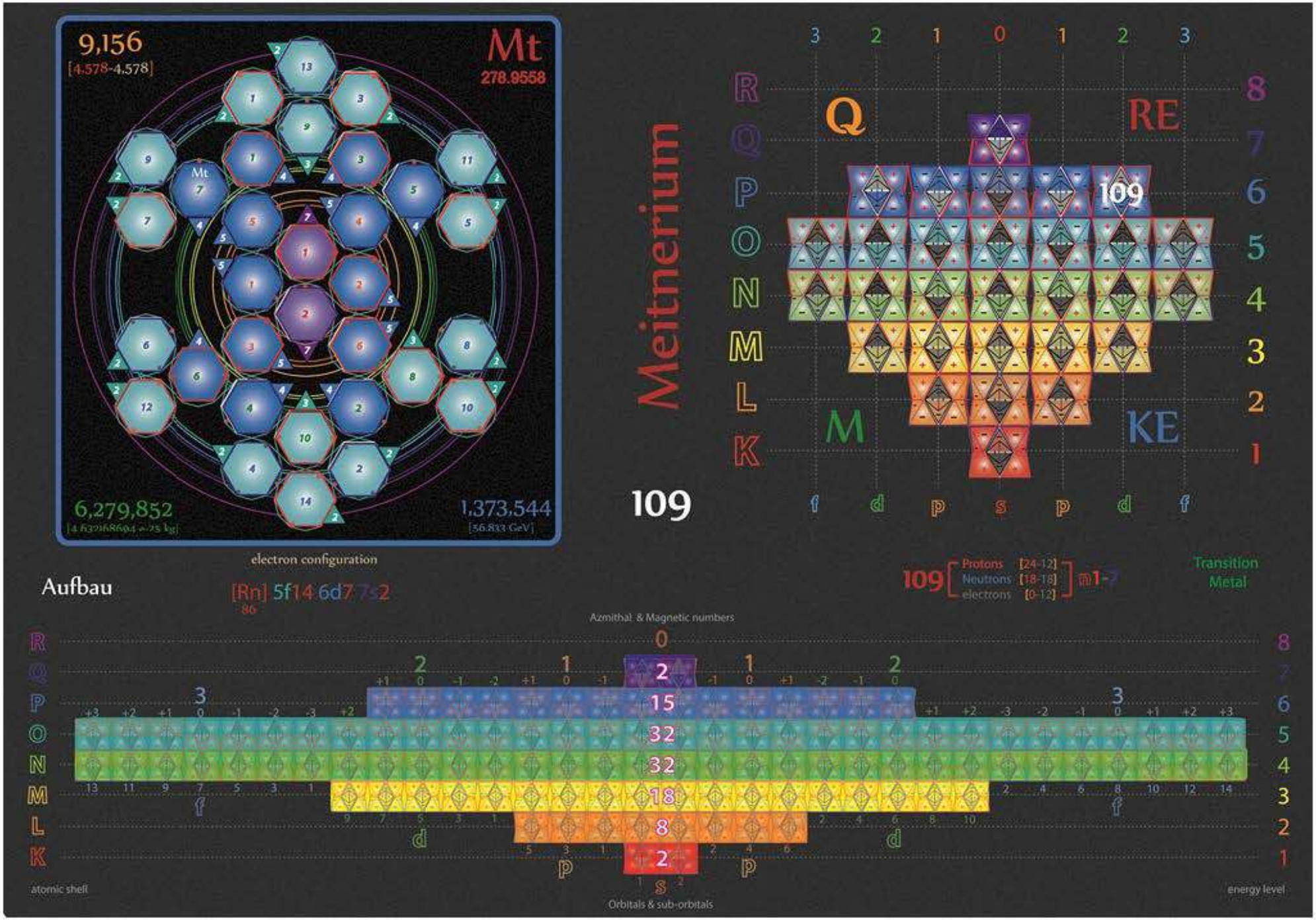

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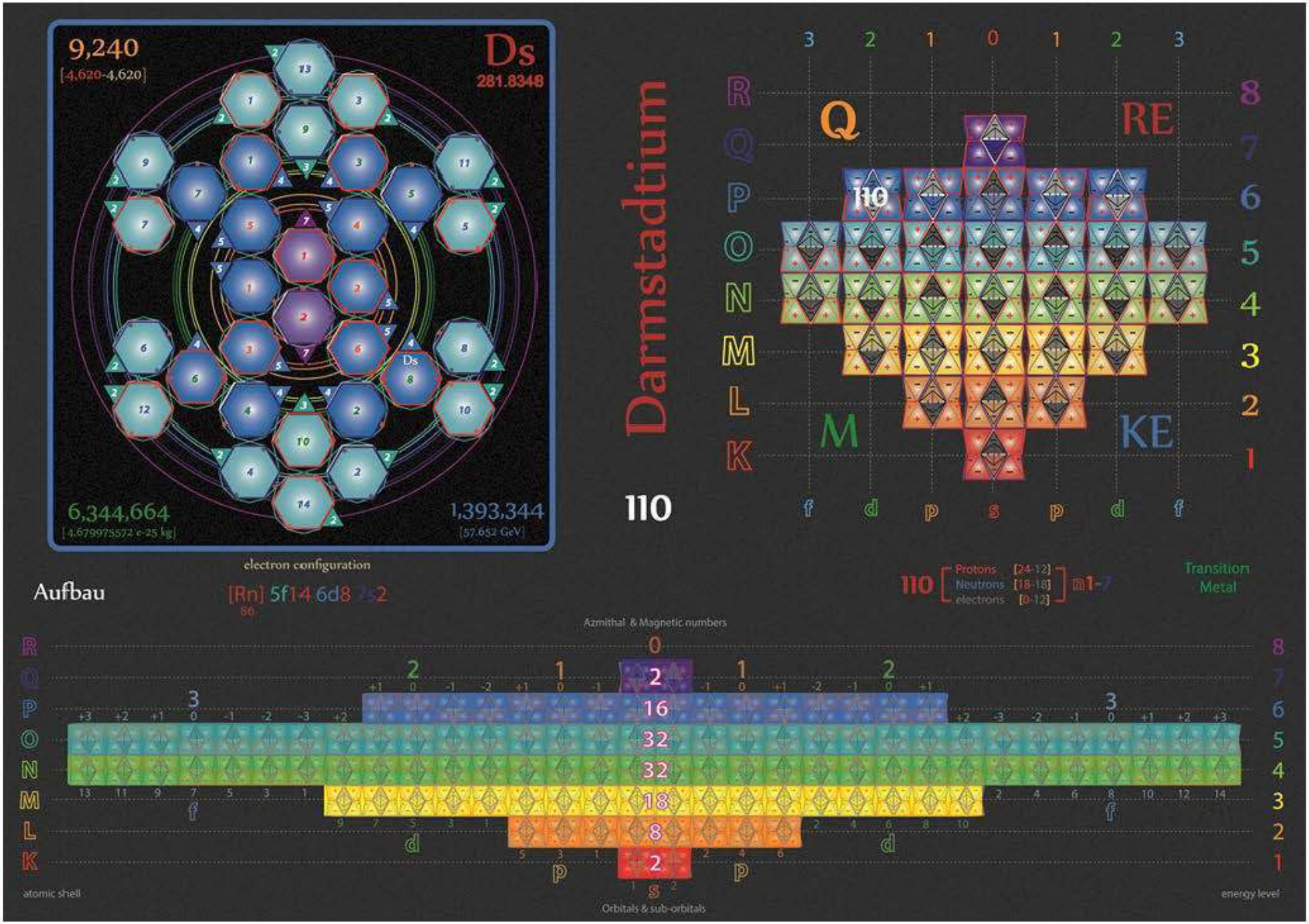

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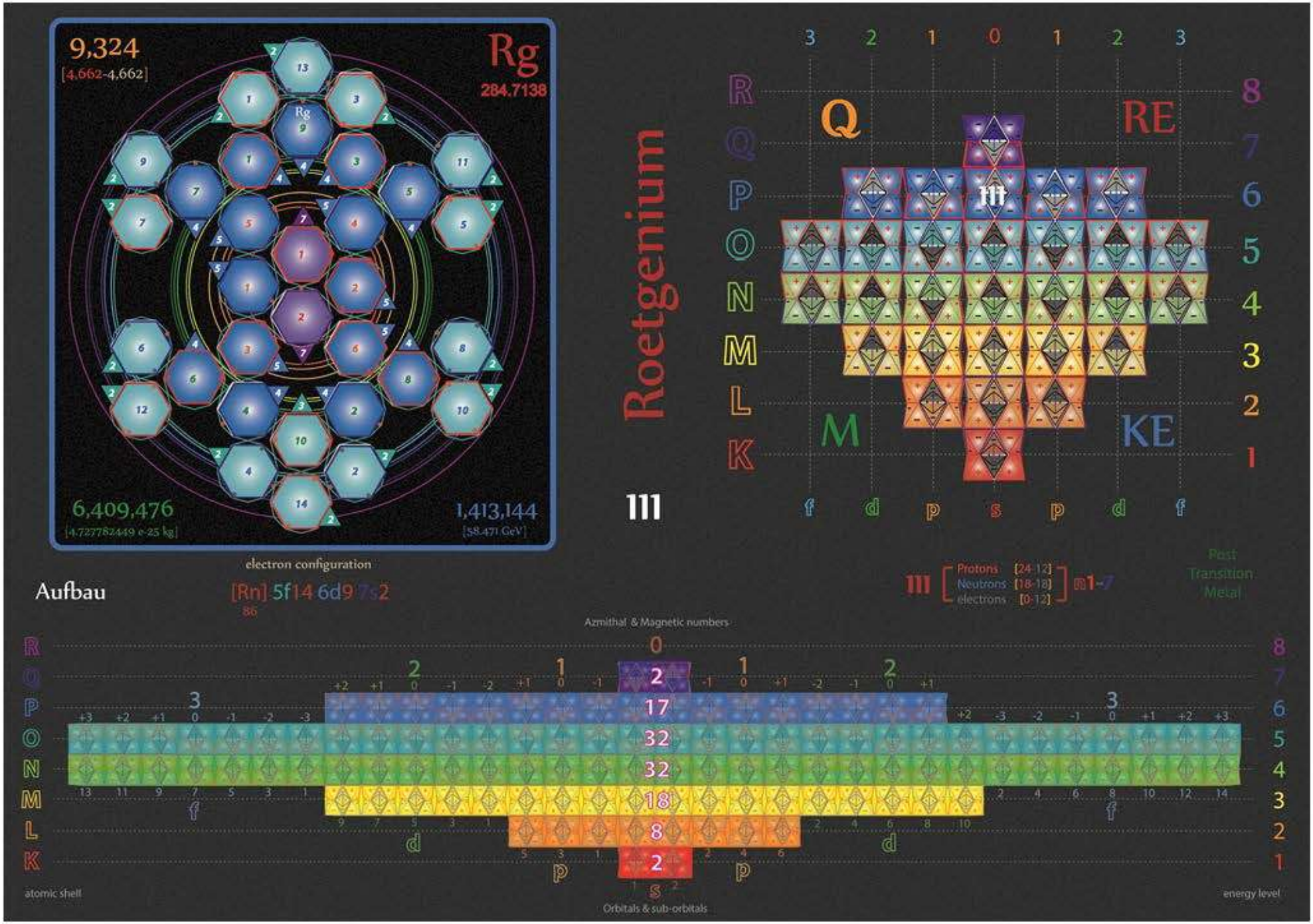

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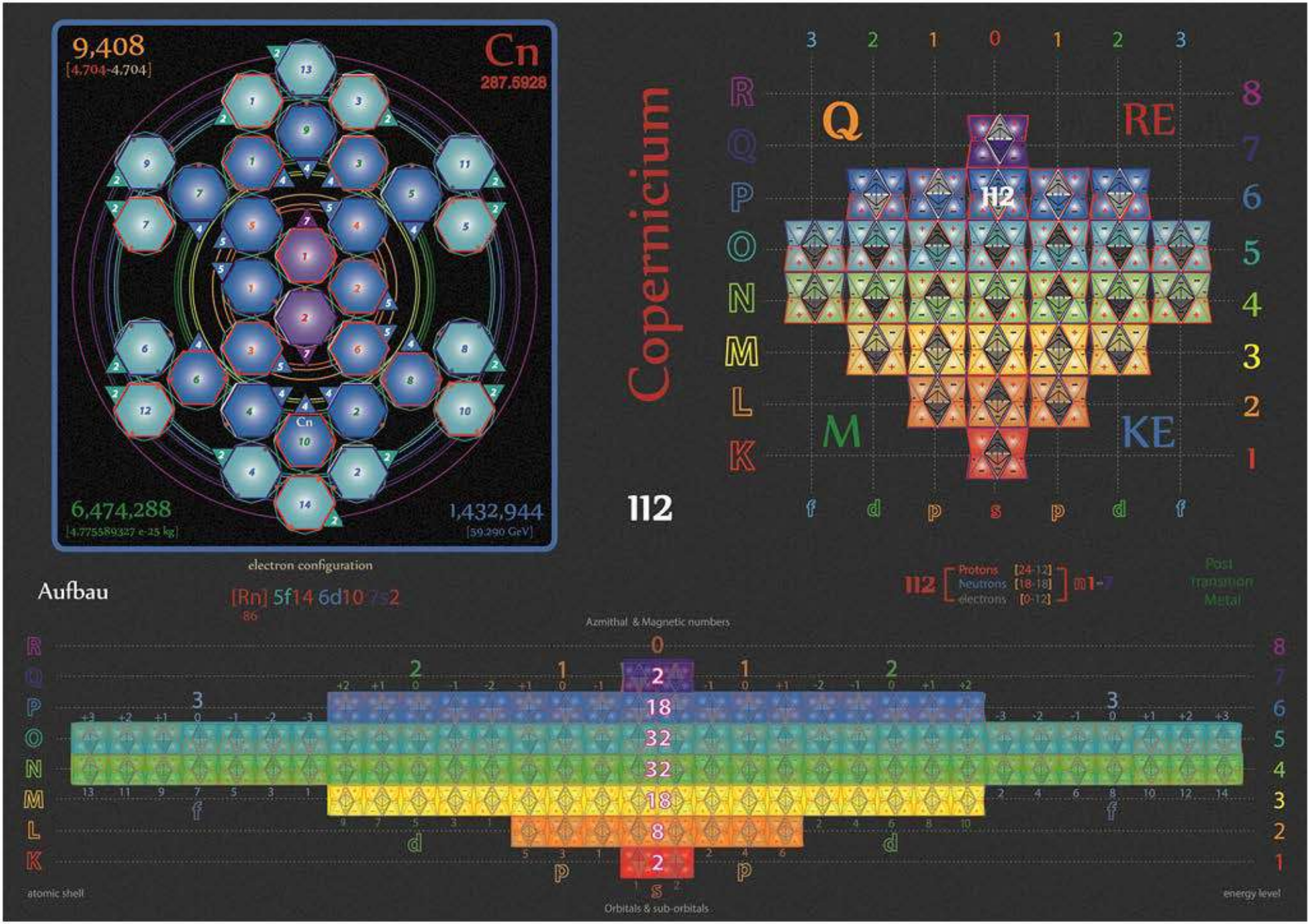

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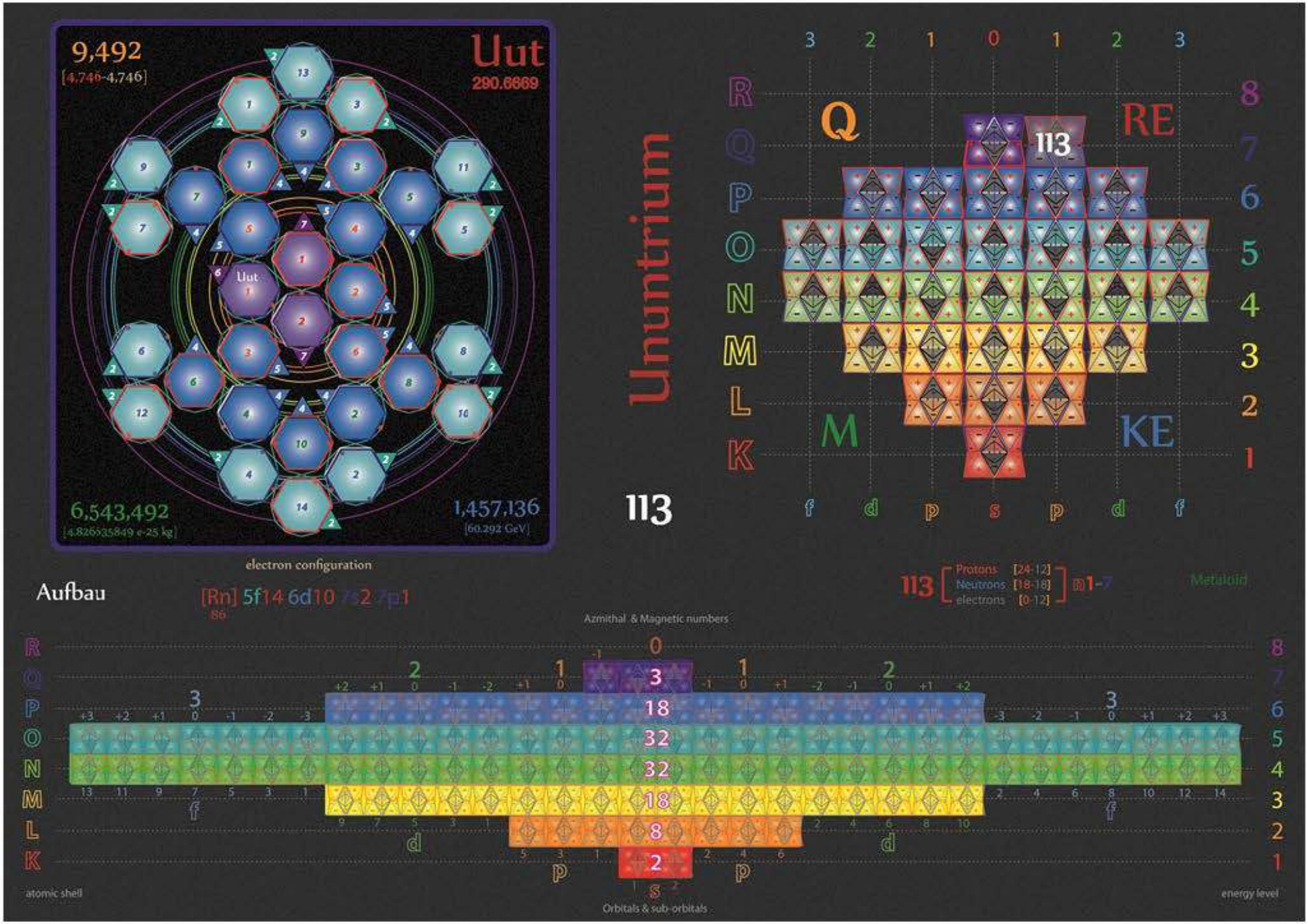

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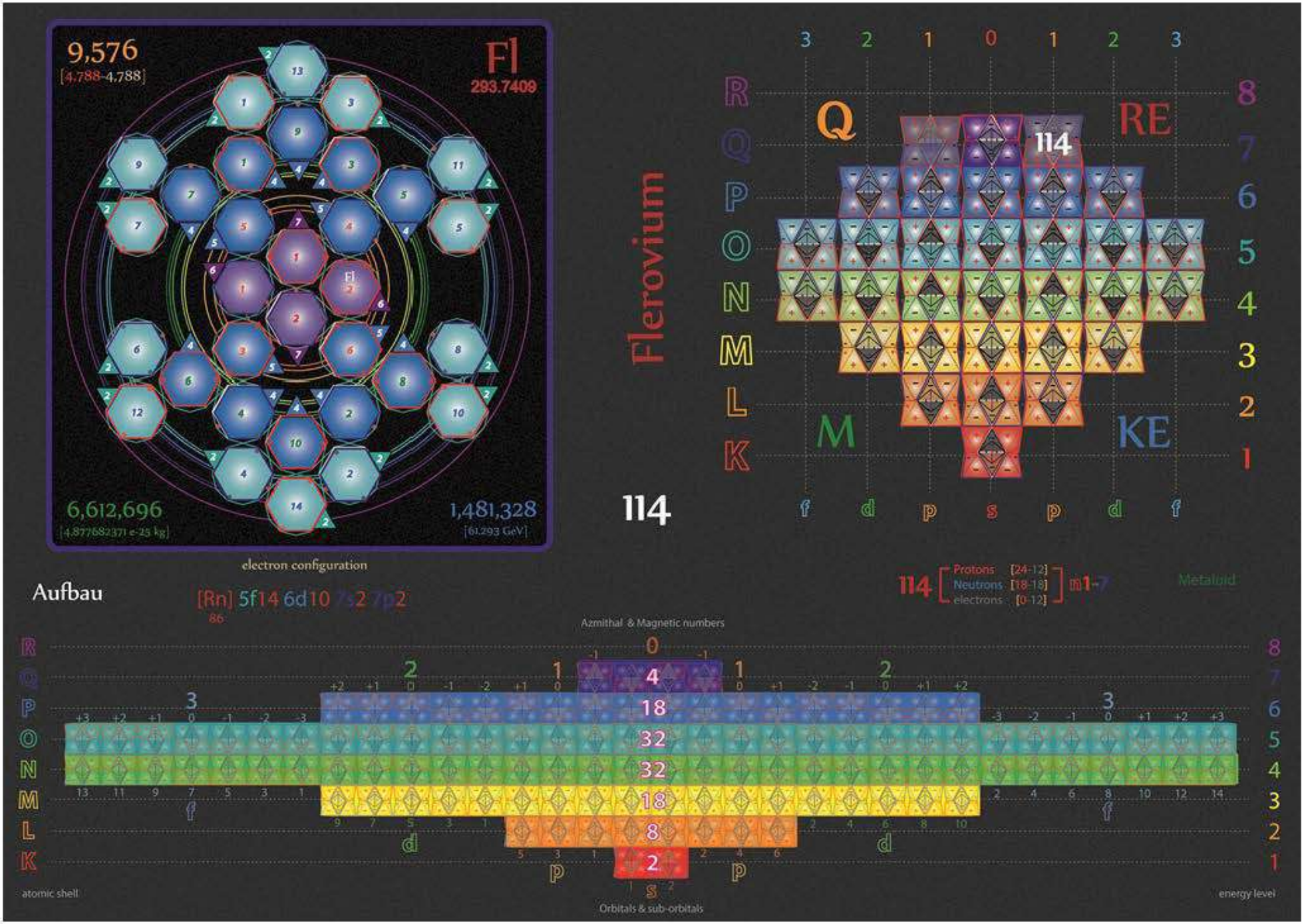

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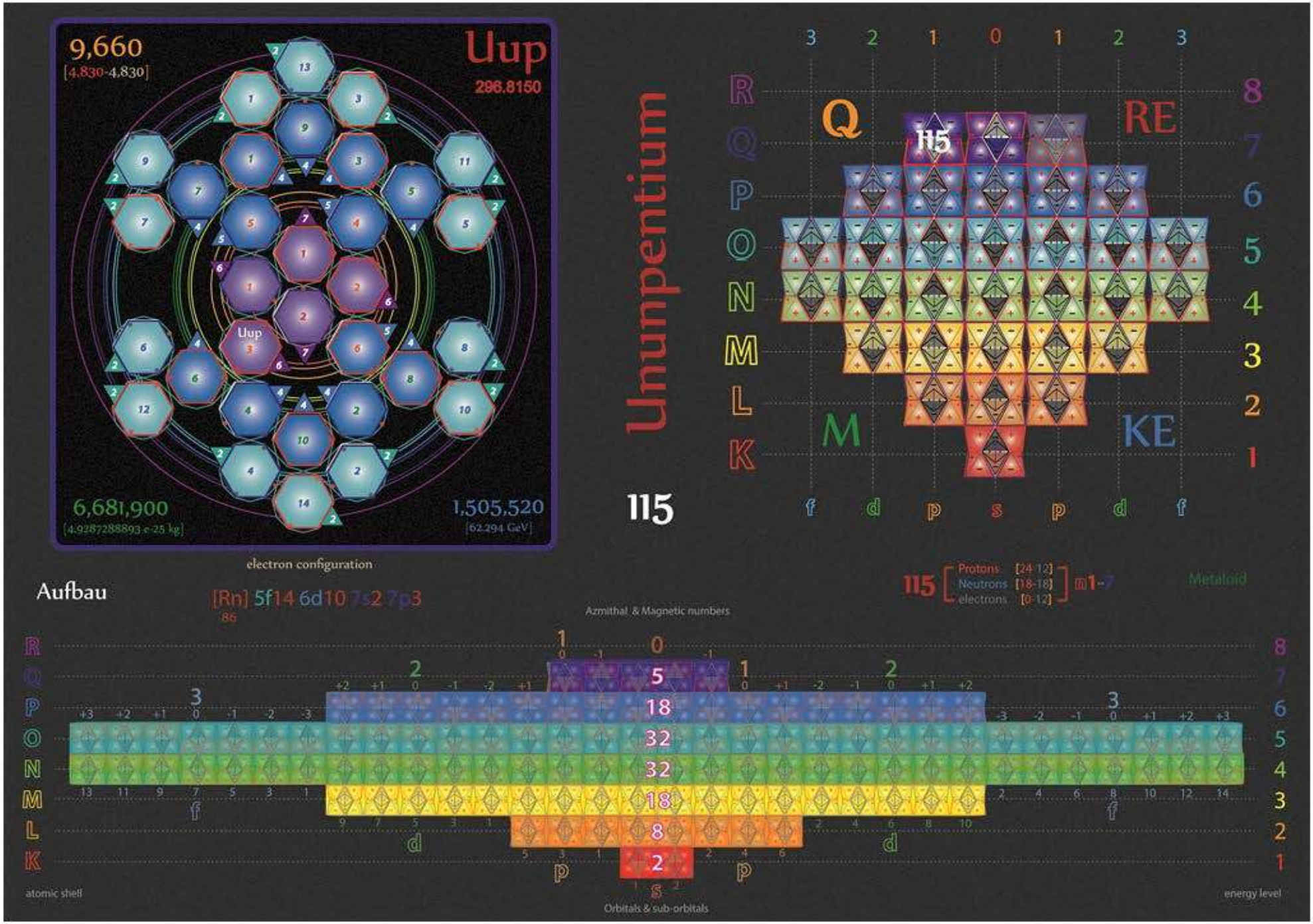

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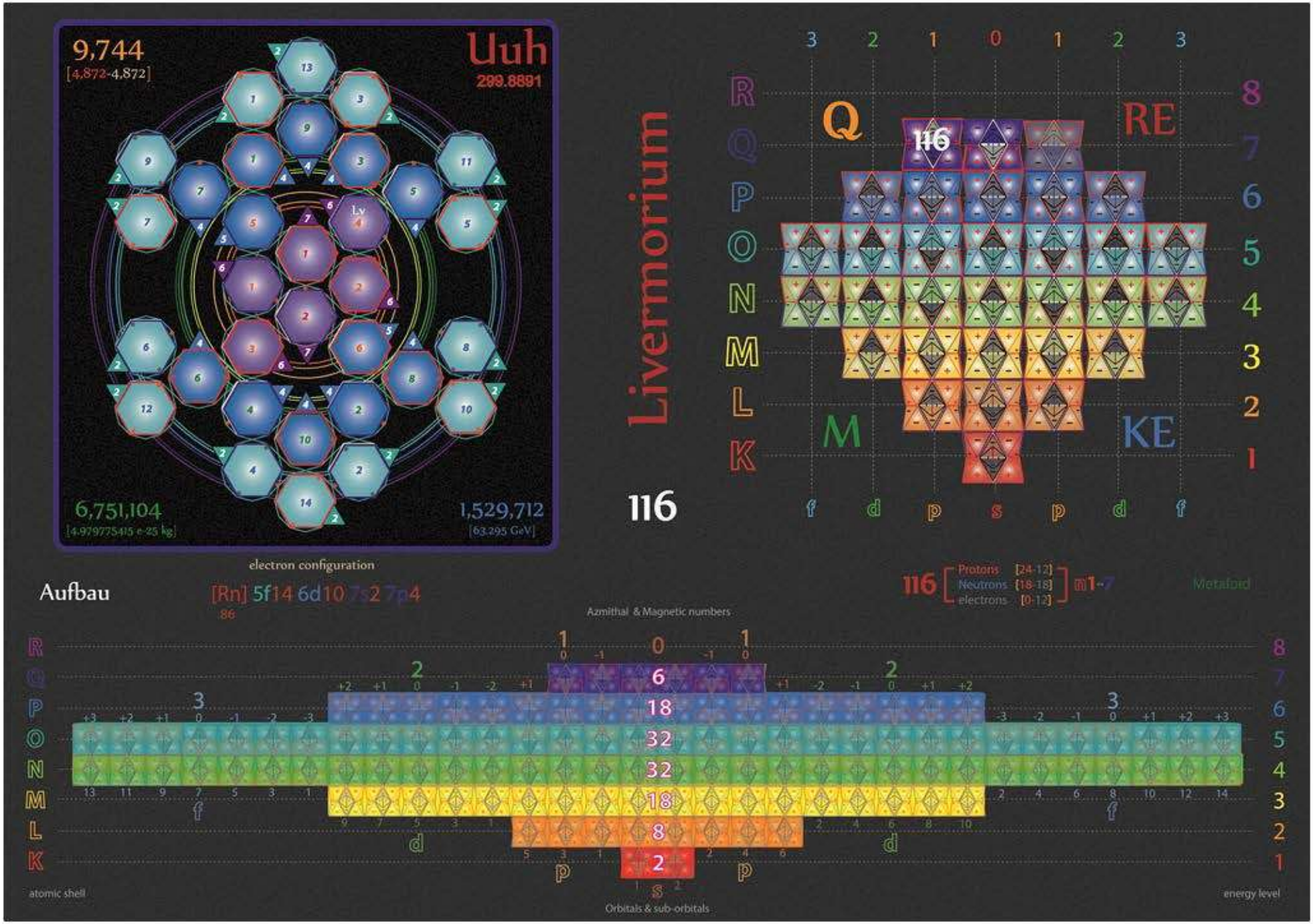

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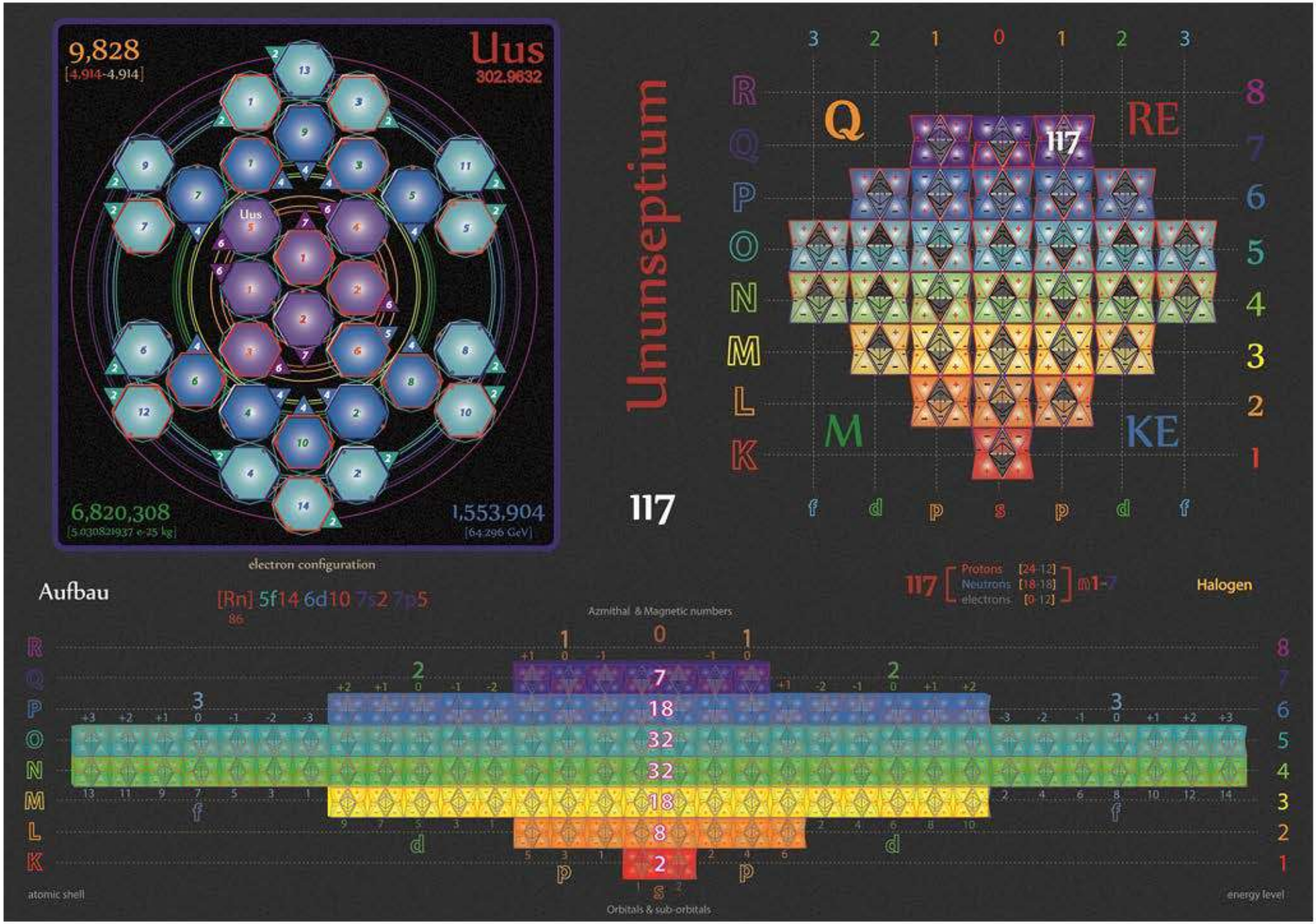

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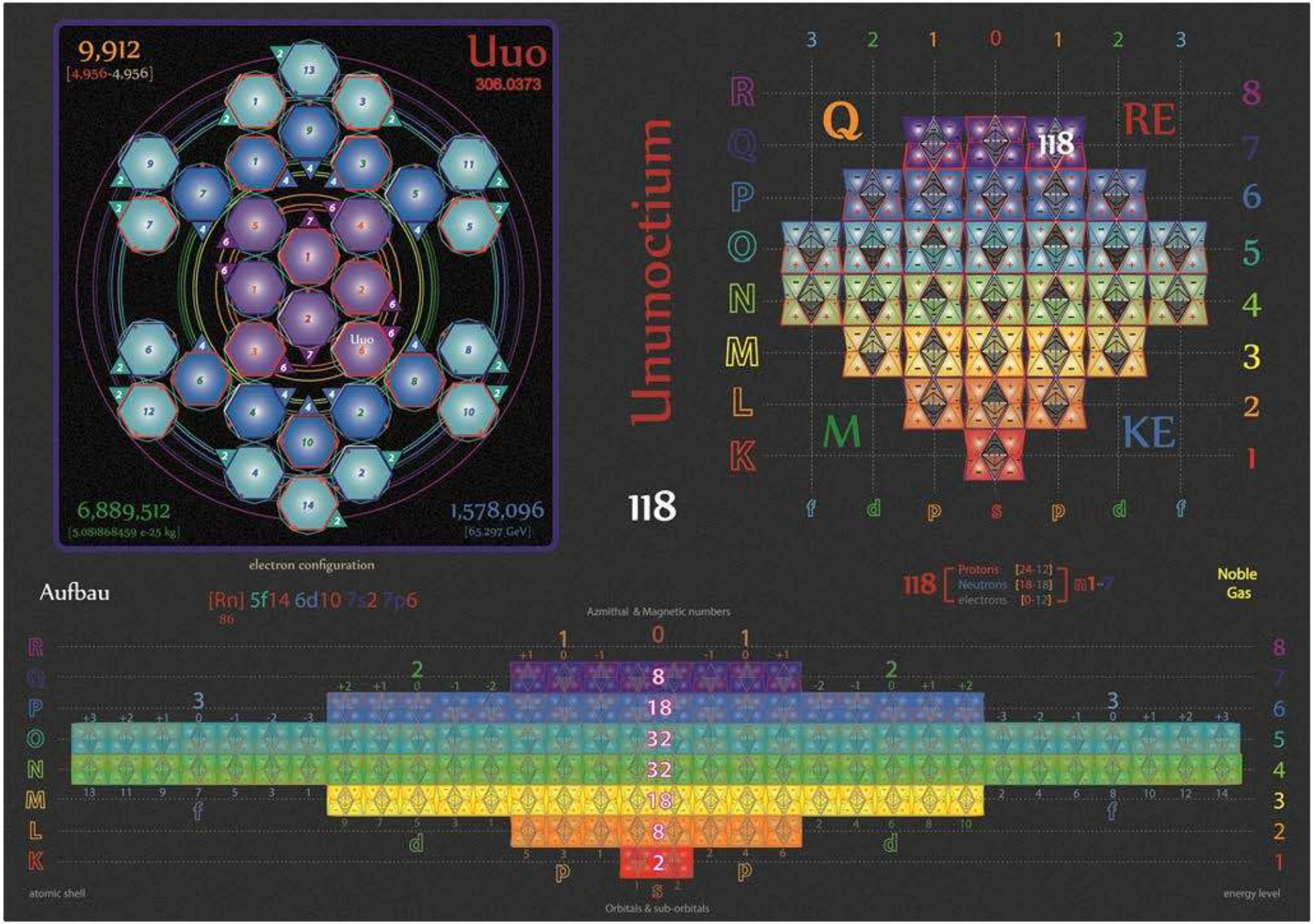

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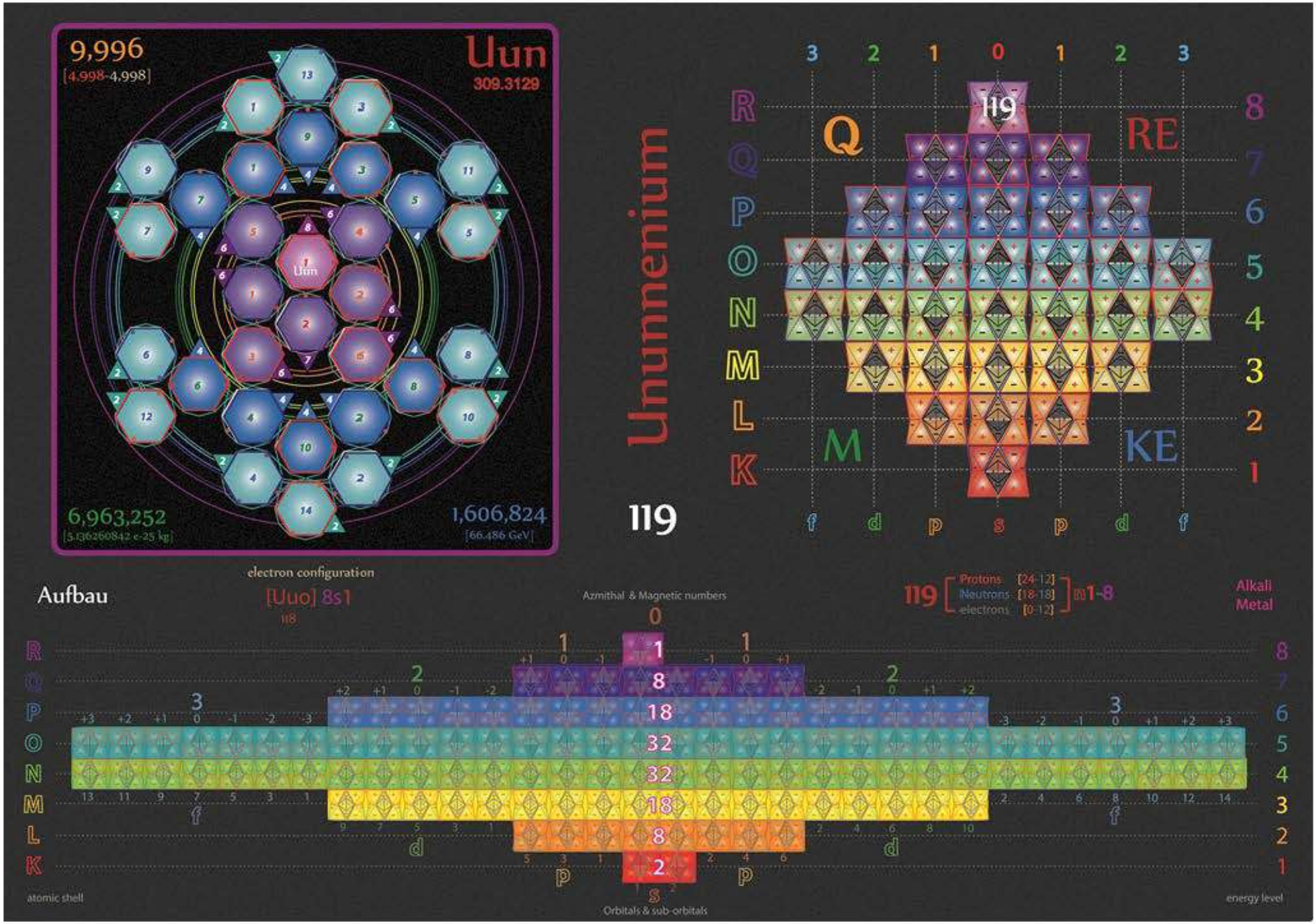

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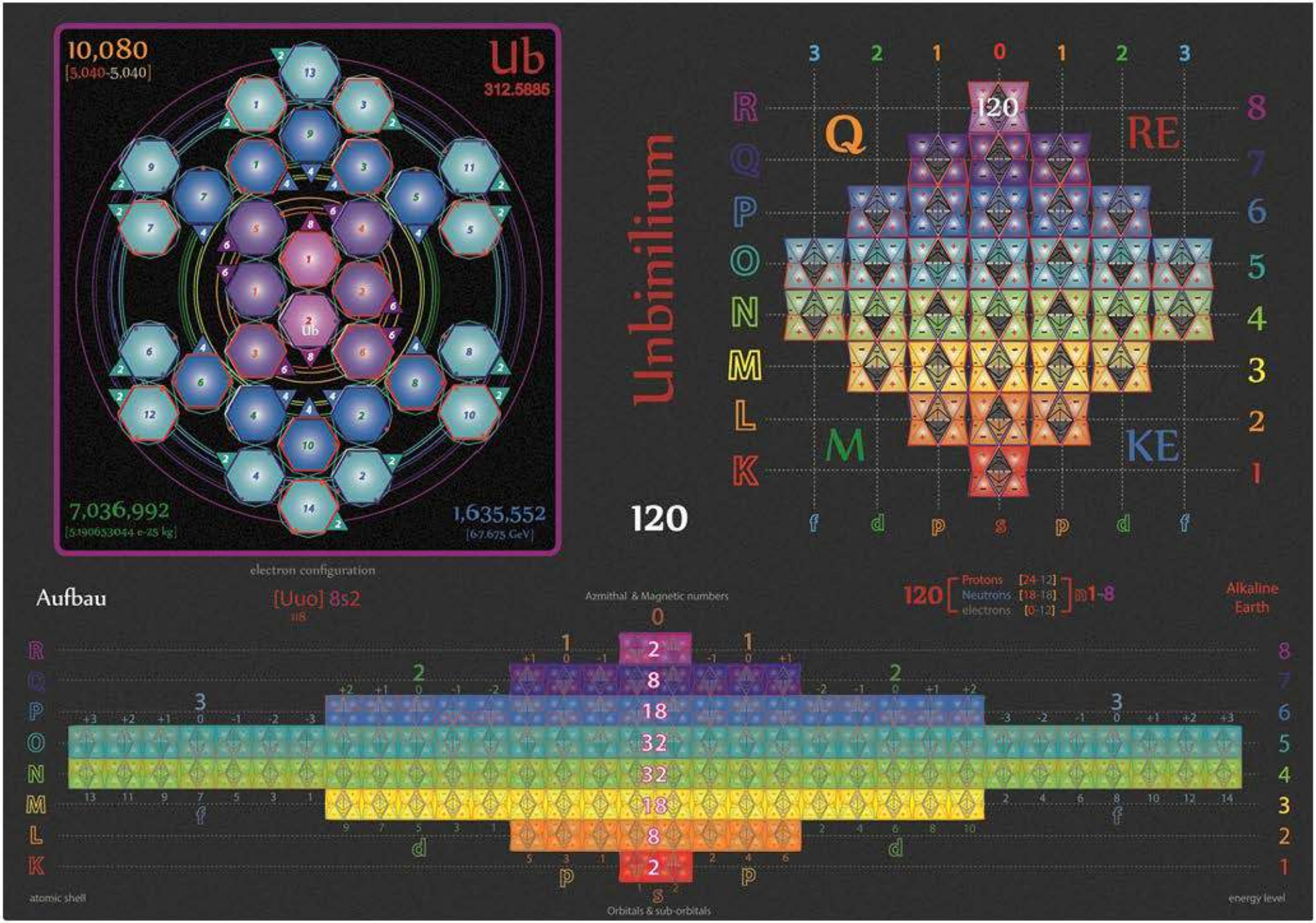

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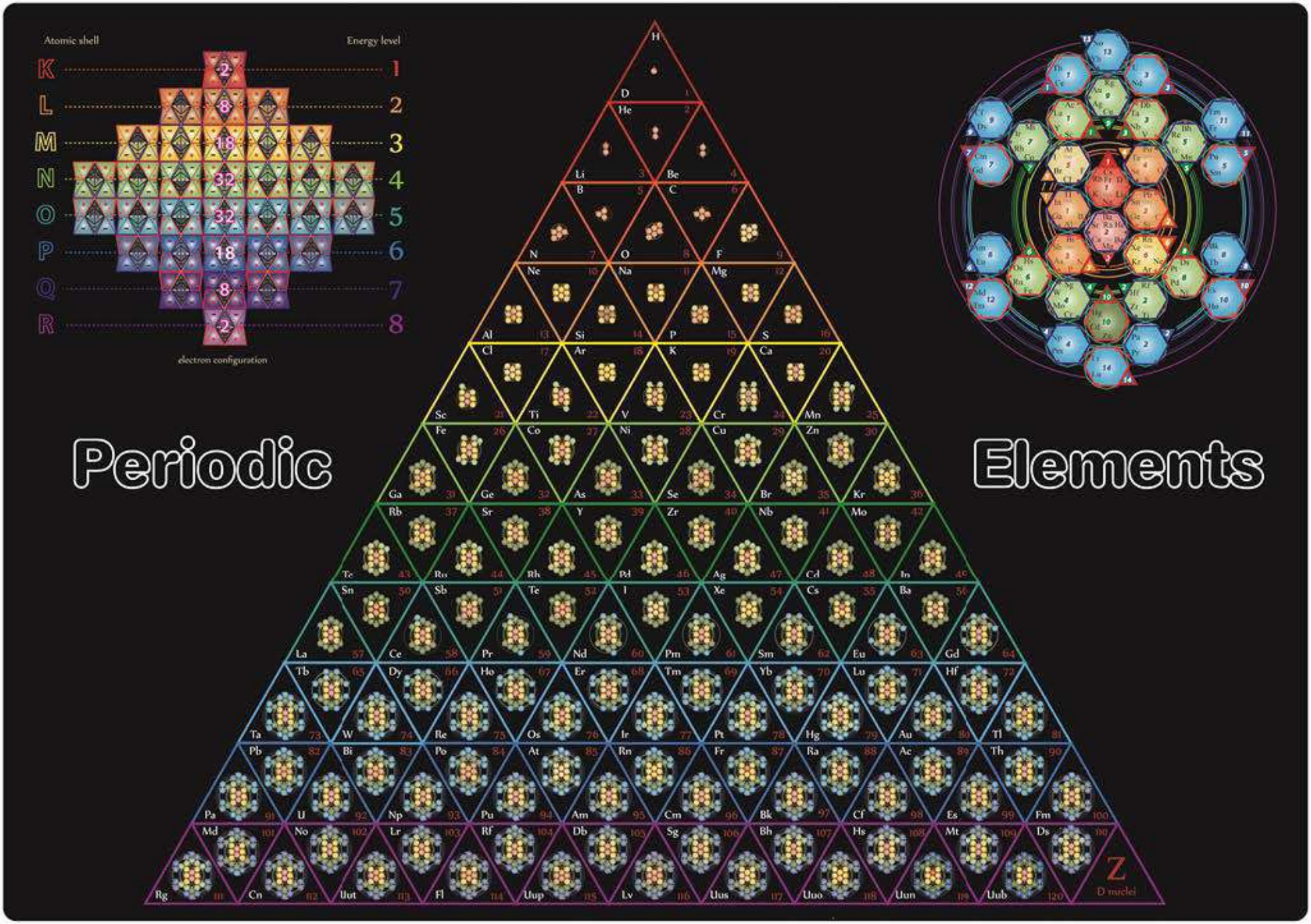

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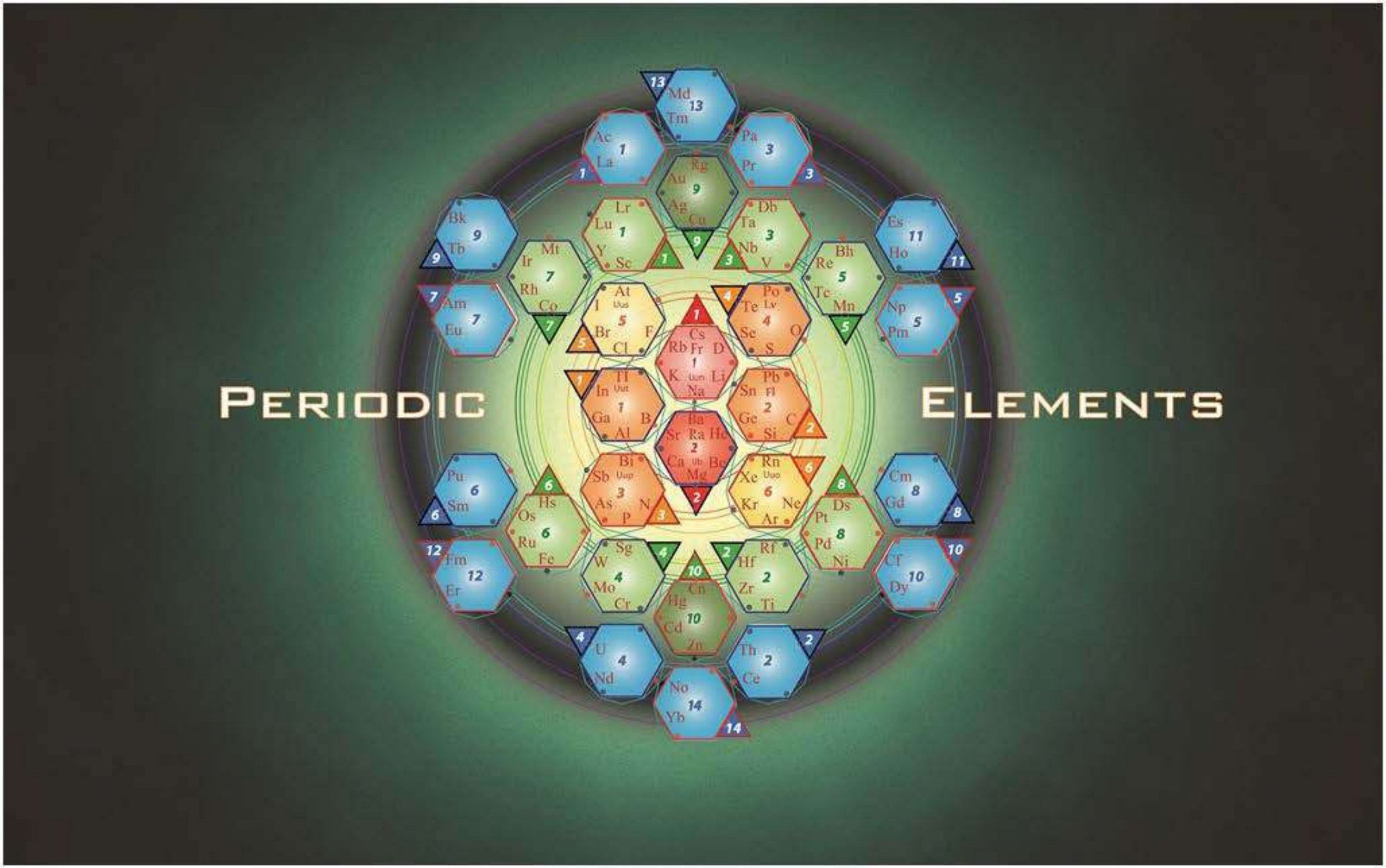


Response to an analysis of Tetryonic Chemistry by Robert J Brotherus [July 2015]

In reply to a paper outlining Mr Robert Brotherus' examination and *mis*-understanding of Tetryonic theory and in particular how it applies to the modern understanding of Chemistry as it currently taught…..

Point by point I'll firstly address the particular points of concern raised wrt modern chemical theory and physics in general:

Tetryonics paper on quantum chemistry is very scarce on making any predictions about atomic properties or comparing such predictions to experimental results.

Tetryonic theory provides many predictions regarding the physical 2d planar **geometrie**s of bosons [radiant mass-energies] and the 3D material **Topologies** of Fermions [Matter and their associated physical properties]. Inclusive in these are many predictions and repeated statements and illustrations of specific particle shapes and the values of mass-energy momenta attributed to each… as well as how these values stem from the equilateral tessellation of Planck energy momenta and why they differ from the established values of modern scientific theory….

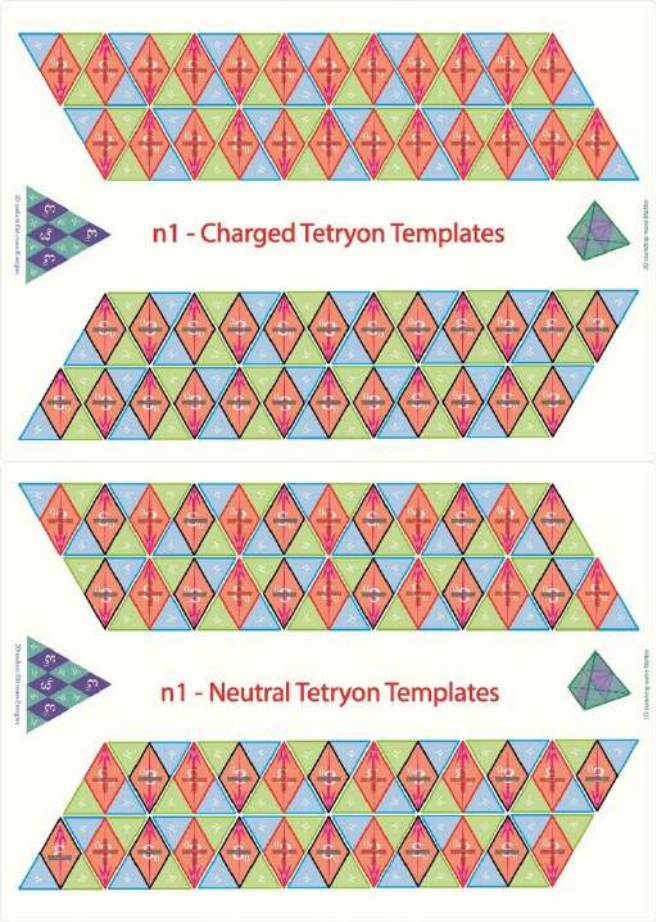
In many cases there are similarities to be found with existing observations but where Tetryonic theory differs from modern theory it is not by choice but rather dictated by the equilateral mass-energies within charged Matter topologies themselves and all too often led to much effort in order to reconcile the differences, leading to further insights and extensions of the theory over time…. Where differences exist it is deliberate not by error.

Tetryonics is a BOTTOM-UP physical theory that unifies many currently disparate theories of science into a coherent unified model of the same – but not without its own set of mental challenges to those who are first becoming acquainted with it. As such it must be recognised that Tetryonic theory should not be studied without a sound understanding of the foundation upon with it is built…. Many have approached analysis of my work in such a way only to find that their analysis was limited by modern science's lack of precise detail of the foundations of the physics that they attempt to explain [to wit modern theory is a top-down explanation of the science build up over many generations with an equal number of varying interpretations and assumptions]

Tetryonics plays down importance of "mathematics" and instead emphasizes "geometry".

Arguably I place a lot of emphasis on geometry over that of mathematics in Tetryonic theory, but only so as it offers insights into physical theory that maths alone has not been able to

provide since its wholesale incorporation into the science in the 1600's. This is not to downplay the importance and productiveness that maths has provided us a scientific tool, but rather to 'illustrate' and draw attention to the advances that a purely geometric model has to offer us in advancing our understanding of the same…. To wit, Tetryonic geometries are based on the postulate that all physical theory is founded on equilateral Planck quanta of energy momenta and as such these physical entities afford no room for speculative ideas or mathematical manipulations beyond what is physically possible to be constructed.



To help elucidate my work and thoughts on the differentiation of 2d planar mass-energy geometries from 3D Material topologies I recorded a detailed YouTube video titled "Tetryonics 101" where I show HOW to use the existing Tetryonic templates [of Planck mass-energy momenta] to construct all the fields [boson & photons] of the Standard model along with the 3D Mater topologies of all the known fermions [and them some]… I do hope you'll take the time to review this detailed instruction on the creation of quantum fields and Matter and try to replicate them same yourself – it is THE most informative thing students of Tetryonics and science in general can do when trying to increase their understanding of the hitherto unseen constituents that make up quantum theory and our macro-scale Universe and the laws of Nature we observe….

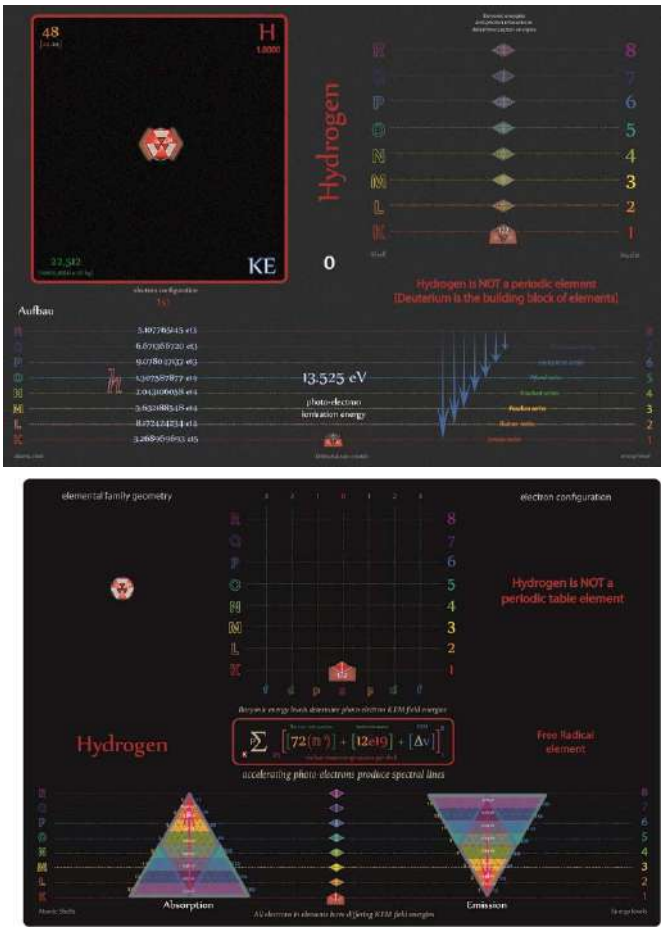
Tetryonics paper on physical chemistry is scarce on such numerical predictions and where it does make such predictions they are often in contradiction to observed experimental facts.

In addition to the maths found within Tetryonic illustrations there are also many spreadsheets developed from those very same equations over time to provide the numerical detail found in the illustrations – particular wrt periodic elements and theory rest atomic masses and kinetic elements etc. – It is by no means exhaustive on every topic imaginable

but they do address the information provided on particles & elements etc. along with their kinetic and relativistic energies of motion.

Tetryonic Problem: Missing hydrogen element

Hydrogen is not missing from Tetryonic theory – in fact it is extensively detailed and modelled in Tetryonics [1] – Quantum Mechanics eBook [again highlight the need not to jump into one's preferred field of expertise and study but rather learn Tetryonic theory as you would any modern physical theory in order of presentation]



Hydrogen is designated as element 00 in Tetryonic theory as it is **NOT** the building block of periodic elements as is currently understood but rather a sub-unit of Deuterium the real building block of all elements…. This is not an arbitrary decision but one forced on anybody who attempts to build physical models of all elements in order to match and explain many of the current established aspects of chemical and quantum theory wrt the quantum electrodynamics of elements themselves wrt molar mass, the Aufbau principle, Schrodinger and Bohr numbers for each element and how Deuterium nuclei [or any other] may bind together in order to form all the elements of the periodic table and their respective spectral emissions lines.

Attempting to build heavy elements utilising Z number Hydrogen nuclei as a foundation with the excess molar masses being accounted for by way of 'extra or excess' Neutrons [as is the established model of modern chemistry] runs into a number of problems immediately – namely:

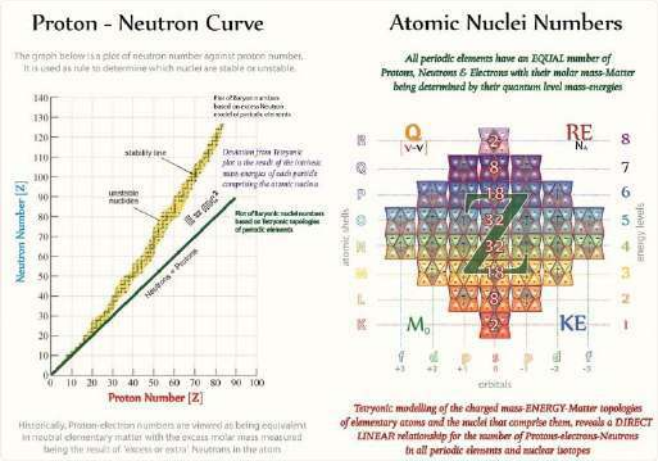
The lack of residual strong Force binding points on nuclei to facilitate the binding of Neutrons to the nuclei in order to form the elements [particularly elements 60+]

The incorrectness of ‘reserve beta decay’ to explain and model Neutron particle formation and the mechanics of electron binding to periodic elements in accordance with Schrodinger’s wave equation and Bohr’s atomic model of the same in order to produce observed spectral line emissions of each element in the PT.

There is no uncertainty or indeterminacy in Tetryonic theory as there is in modern theory to explain away such inconsistencies between various aspects of physical theory – each attribute MUST be modelled and explained from first principles & invariably leads to new insights into quantum chemical theory that are at odds with established lines of thought.

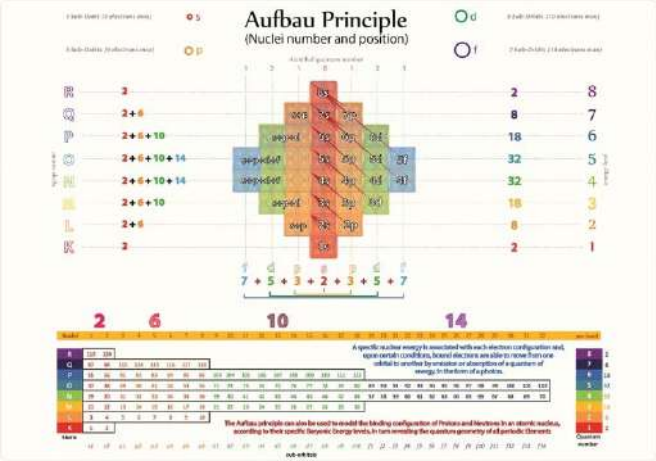
To wit I stand by the claims and statements made in my eBooks :

> Each elemental nuclei is made from Deuterium" (p. 12)
> “120 elements in 8 quantum levels *and hydrogen as a free radical*.” (p. 26)
> “Deuterium (not hydrogen) is the building block of all elements." (p. 21)
> “Hydrogen is NOT a periodic element” (p. 83)

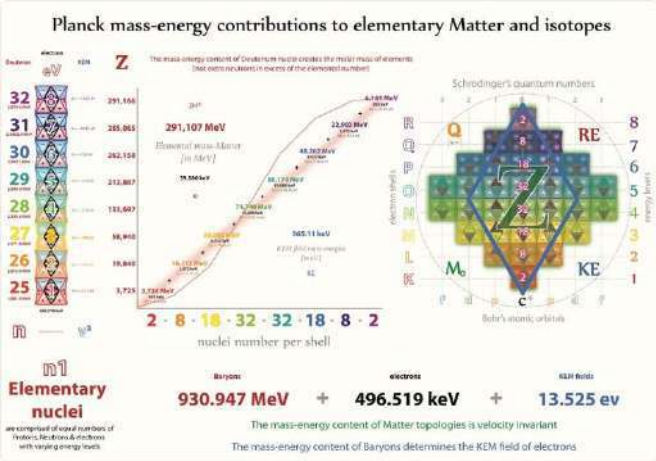

Proton - Neutron Curve
Neutron Number [Z]
Proton Number [Z]
Atomic Nuclei Numbers
All periodic elements have an EQUAL number of Protons, Neutrons & Electrons with their molar mass-Matter being determined by their quantum level mass-energies
Tetryonic modelling of the charged mass-ENERGY-Matter topologies of elementary atoms and the nuclei that comprise them, reveals a DIRECT LINEAR relationship for the number of Protons-electrons-Neutrons in all periodic elements and nuclear isotopes

As it is the ONLY way to model and explain how all the periodic elements are created from equilateral Planck energy momenta that is in accord with the known observables… they are not in agreement with some aspects of established theory BUT they do closely mirror the observables and once KEM fields of thermal heat, kinetic motion etc. are taken into account provide a very accurate quantum model of chemical processes at the quantum scale.

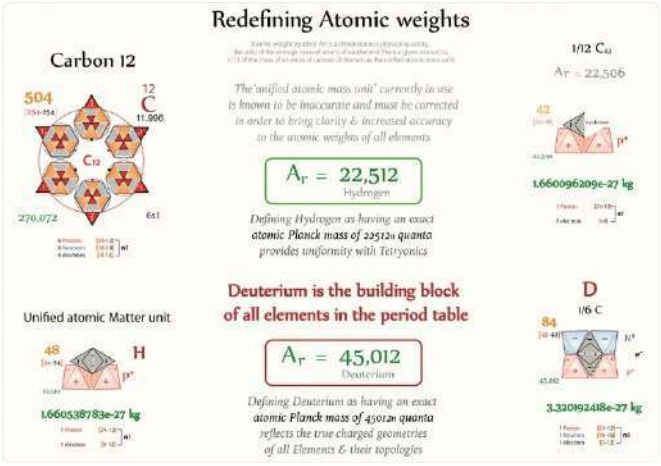
Tetryonics does not throw all these facts out of the window just because hydrogen does not fit neatly into my [or other] pre-conceived set of boxes and triangles and hexagons, they are calculated from the Material models and immaterial fields associated with each element that MUST grow from first principles… not from assumptions elaborated upon over time.



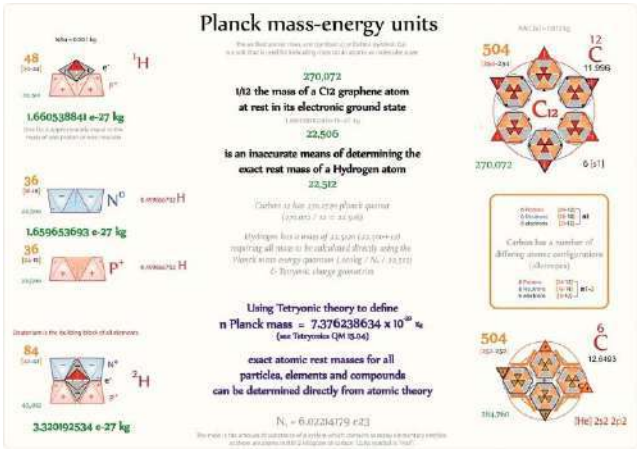
In fact the Aufbau table is shown in Tetryonic theory to be a table that has been ‘right justified’ to match the nomenclature of mathematics rather than the geometric topology of reality [which is centred about the principle quantum numbers and shells of Schrodinger and Bohr respectively]… it is only our skewed perspective of maths that prevents most from seeing the real symmetry present in atomic nuclei as detailed in the quantum numbers of Schrodinger’s wave equation for the same … ie there are no g,h,I,j, shells as supposed and all the quantum numbers of Schrodinger’s wave equations match the symmetric topology of elements as geometric portrayed in Tetryonics [and are in agreeance with Bohr’s shells and orbitals as well, thus unifying all 3 theories]


Planck mass-energy contributions to elementary Matter and isotopes
291,107 MeV
2 · 8 · 18 · 32 · 32 · 18 · 8 · 2
nuclei number per shell
Schrodinger's quantum numbers
n1
Elementary nuclei
930.947 MeV + 496.519 keV + 13.525 ev
The mass-energy content of Matter topologies is velocity invariant
The mass-energy content of Baryons determines the KEM field of electrons

The material topologies of Tetryonic theory then also lead to the necessity to correct ‘weighted’ values for all known particles and elements [and then some] in light of the quantum mechanics of the same – ie their identical 3D charge topologies and the mechanics of the quantum rotating synchronous convertors [Deuterium nuclei] that they form in deference to the accepted theory of mini-solar systems and Neutrons that are heavier than their identical charged counterparts [Protons and anti-Protons]

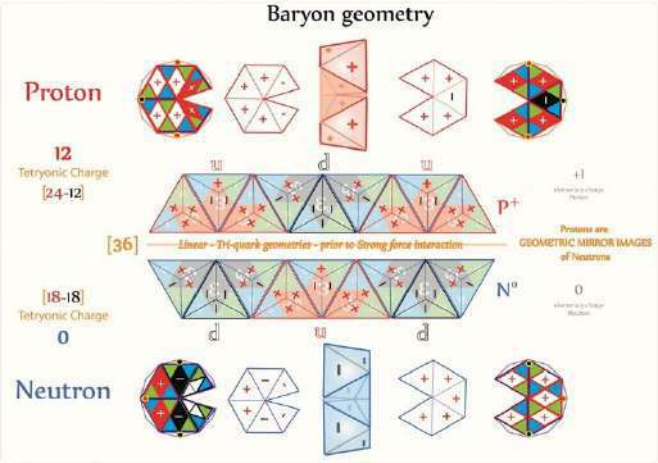

Redefining Atomic weights
Carbon 12
504
12
C
11.996
C12
270.072
6s1
The 'unified atomic mass unit' currently in use is known to be inaccurate and must be corrected in order to bring clarity & increased accuracy to the atomic weights of all elements
Ar = 22,512
Hydrogen
Defining Hydrogen as having an exact atomic Planck mass of 225120 quanta provides uniformity with Tetryonics
Deuterium is the building block of all elements in the period table
Ar = 45,012
Deuterium
Defining Deuterium as having an exact atomic Planck mass of 450120 quanta reflects the true charged geometries of all Elements & their topologies
1/12 C12
Ar = 22,506
1.660096209e-27 kg
D
1/6 C
3.320192418e-27 kg
Unified atomic Matter unit
48
H
1.660538783e-27 kg

Point in case being **Tetryonic Problem: Incorrect Proton and Neutron masses**
As detailed in illustration 49.04 & 49.05 respectively in my eBook… Tetryonics demands an exact mass for Planck quanta and the molar masses [at absolute zero] for each and every particle in our Universe for modelling and any additional energy momenta [by way of thermal, spectral, kinetic or observational energies etc.] are accounted for in the KEM fields of each respective element or particle.

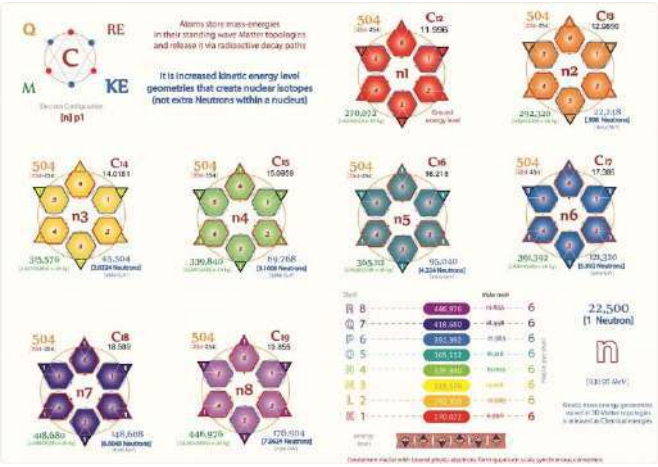


There is NO room for a 'weighted' atomic mass as utilised in modern chemistry which conveniently ignores the mass and motional energies of the electrons in the elements or which ignores the KEM field energies noted above for 'most' situations and calculations – Tetryonic theory MUST account for all of these energies even if it does so at the risk of disagreeing with modern theory at times…

The Proton and Neutron MUST have identical atomic masses as they are identical – both are 36π Baryon Matter topologies differing only in the net charges of +12 [24-12] vs 0 [18-18] they possess as a result of their constituent quarks [UDU vs DUD] as extensively detailed in my QM eBook… Neutrons are NOT created through the process of 'reverse' beta-decay as is supposed presently supposed in modern theory and accordingly do NOT have a slightly higher mass than Protons which in turn affects the molar mass calculations for all periodic elements and isotopes as outlined in my Chemistry eBook as well at length.



Ie Carbon 13, 14 and upwards are not the result of 'extra' Neutrons being bound to the Carbon nuclei – such a nuclei if possible would be stable and not decay as observed – but rather they are simply the result of the inherent 'squared' equilateral mass-energies of each Baryon in the nuclei being increased from n1 to n2 to n3 …. Resulting in a net mass increase that 'appears' to be the result of a number of 'extra' Neutrons in the nuclei [again this is detailed in my Chemistry eBook and spreadsheets of the calculations be easily created from the formulae found in chapter 53 on my Chemistry eBook….

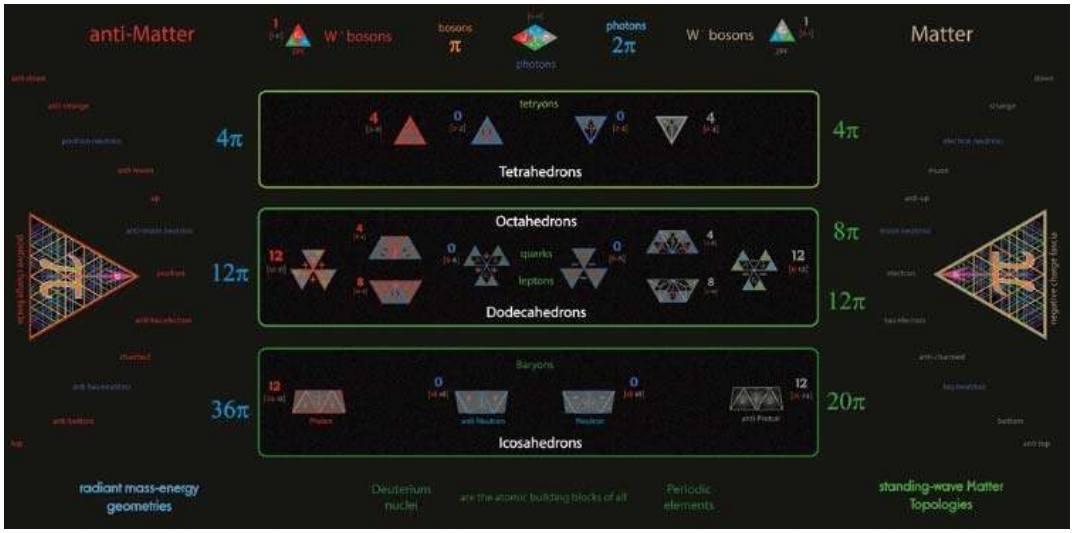


This 'significant discrepancy' with Tetryonics prediction of Proton and Neutron masses from observed ones alone will be enough to prove Tetryonic theory a worthy successor to modern quantum chemistry theory – unless you can explain all of the above using 'excess' Neutrons.

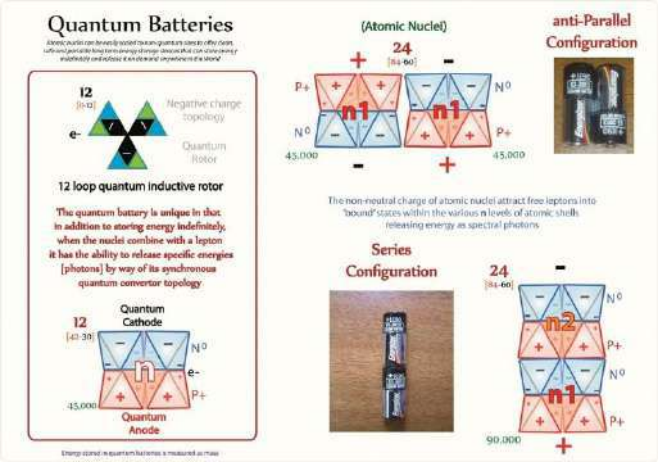
I am neither ignorant of the basic masses of basic particles nor do I think that Tetryonic theory and observed facts of nature disagree, but rather the established theoretical 'facts' of modern chemical theory must be in error

I agree that in reality Matter has **3D structure** (including **volume**) hence the terminology of Matter **topologies** throughout my work. To portray my planar illustration of elements and particles in my PDF eBooks as not reflecting their true material topologies is grossly inaccurate and reflects that fact that **YOU have NOT read all my work** including Tetryonics 101, the Google sketch warehouse of 3D CAD models of each and every particle [kindly developed by Rene Cormier over many months of effort] and extensive list of all elements and their charged 3D topologies and electronic wave function properties and numbers which are freely available to all – only planar 2 d mass-energy **geometries** [bosons and photons]

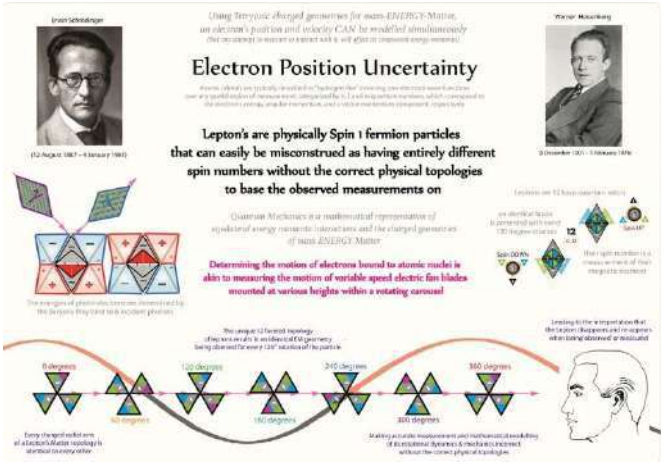
are portrayed as being like thin 2D sheets in Tetryonic theory, something I am sure you will become more familiar with as your understanding of T-theory advances,[and your distain for its predictions and values not in accord with modern theory wains over time].



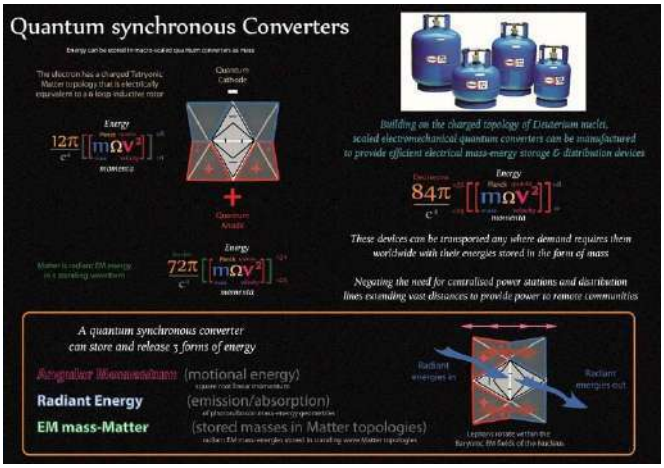
Regarding the ‘separation ‘ of electrons from the atomic nucleus – this is an antiquated model of quantum electrodynamics that is fashioned on planets and their satellites [ie the mini-solar system Bohr model] and which has been extended to a fuzzy electron orbital model to incorporate the Schrodinger quantum model and the ‘inherent’ quantum uncertainly/indeterminacy of statistical probabilities intrinsic to quantum theory as the theories developed over time…. Tetryonics makes it quite clear in T[1] – QM that the atomic nucleus is in fact a quantum synchronous convertor [ala Tesla/Westinghouse] that can store and release mass-energies in a controlled and predictable manner [ala isotopic decay and spectral line emissions] and that quantum mechanics is NOT quantum inherently uncertain nor in determinant as it is often portrayed – in fact quantum theory as explained by Tetryonic theory is very much deterministic in every way – it was only our top-down view of the mechanics that led modern science to this erroneous conclusion, which I have attempted to correct through Tetryonic theory.



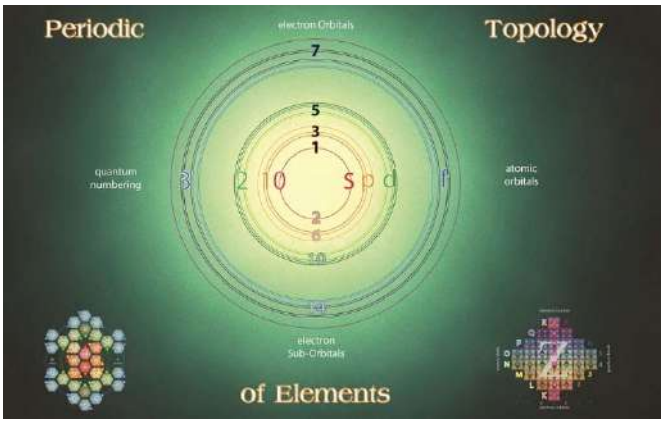
The electron does not orbit the atomic nucleus of any element but rather is bound via its magnetic dipole moment to the positively charged nucleus and spins akin to the rotating rotor of quantum convertor partially within the 3D Matter topology of Deuterium nuclei….


Electron Position Uncertainty
Lepton's are physically Spin 1 fermion particles
that can easily be misconstrued as having entirely different
spin numbers without the correct physical topologies
to base the observed measurements on
Determining the motion of electrons bound to atomic nuclei is
akin to measuring the motion of variable speed electric fan blades
mounted at various heights within a rotating carousel

Again these models have all been built and operate according to established electrodynamic theory and their operation is well understood in the macro sense [but obviously the acceptance of such a model strains the thoughts of most who have grown up a mental picture of fuzzy electrons orbiting a spherical nuclei]

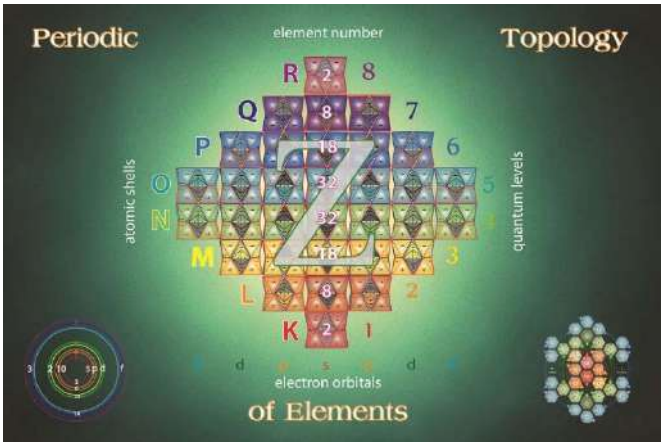

Quantum synchronous Converters
A quantum synchronous converter
can store and release 3 forms of energy
Angular Momentum (motional energy)
Radiant Energy (emission/absorption)
EM mass-Matter (stored masses in Matter topologies)

Again the electronic structure of each and every one of the 120 possible periodic elements is well detailed wrt Bohr shells & orbitals and unified wrt their respective Schrodinger numbers for the same in my Chemistry eBook for all to view…. Unlike modern texts which normally stop at element 20 and claim that it is just too difficult to show the quantum models of larger elements with their evermore complex electron configurations and Schrodinger numbers

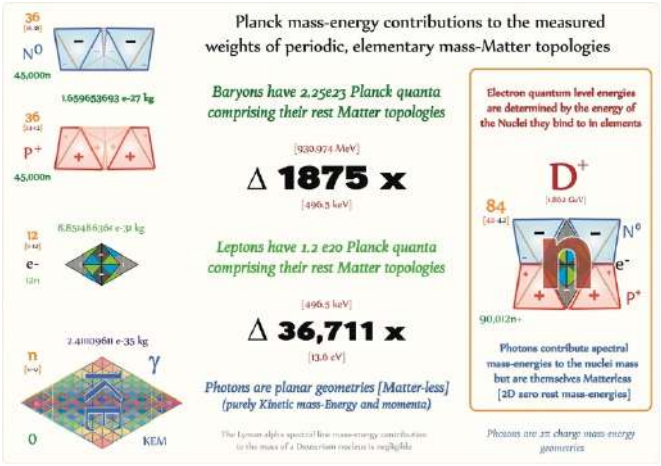


The s.p.d & f orbitals of electrons ‘around’ any elementary nuclei is the result of the atomic nuclei rotating about is centre of mass/gravity [classical angular momentum] and the

electrons tracing out easily determined and well defined concentric orbits about the same centre [as illustrated] …. A close examination of the Schrodinger numbers [or in fact Bohr orbits] of heavier/larger Z number atomic nuclei reveals the there are no g,h I orbits etc as often postulated but in fact there is a reversal of electron orbital distance as the element number and principal energy levels increases….. Resulting in the periodic symmetry depicted in Tetryonic theory of an atomic nucleus resembling a child's spinning top, which could be mistaken for a spherical topology from our macro view of the quantum scale.

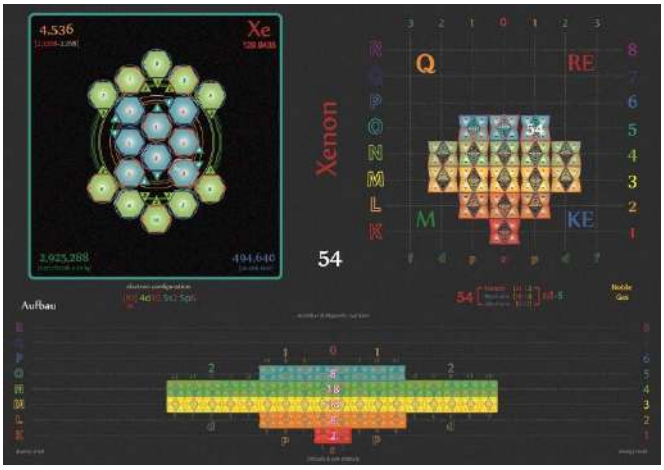


With each element's Z number reflecting the number of **Deuterium** atoms in each nuclei, *not the number of Hydrogen atoms with an ever increasing number of Neutrons to account for observed molar masses*

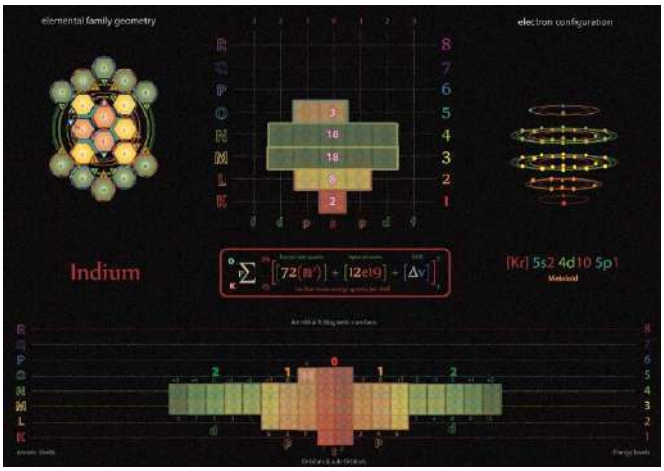

Planck mass-energy contributions to the measured weights of periodic, elementary mass-Matter topologies
Baryons have 2.25e23 Planck quanta comprising their rest Matter topologies
Δ 1875 x
Leptons have 1.2 e20 Planck quanta comprising their rest Matter topologies
Δ 36,711 x
Photons are planar geometries [Matter-less] (purely Kinetic mass-Energy and momenta)
Electron quantum level energies are determined by the energy of the Nuclei they bind to in elements
D+
Photons contribute spectral mass-energies to the nuclei mass but are themselves Matterless [2D zero rest mass-energies]
KEM

The electrons associated with each atomic element's structure in fact have an important and direct bearing on the spectral emissions of each particular element. Even though their mass-energies of their electronic topologies are only 0.000533' % of the mass-energies of each Baryon in any atomic nuclei this mass-Matter differential along with the energy momenta of the electron's KEM field is key to facilitating the absorption and release of spectral line emissions particular to each and every element known… again, it is not simple good enough to conveniently ignore electrons ad hoc in scientific theory to suit a particular point or theory just because they are or 'insignificant' mass compared to the whole nucleus. Any successful model of science and physics in general must be able to account for ALL the known aspects of modern observations not just a select few that suit their purposes in order to unify physics on all energy scales. Ie a new model of the quantum structure, topology and mechanics of atomic nuclei must account for charge, atomic and chemical interactions, spectral line series and all known elements and compound creation in the ONE physical model.

Clarifying question about Tetryonics nuclear vs. atomic size wrt the Zenon atom
I humbly submit that illustrations 51.49



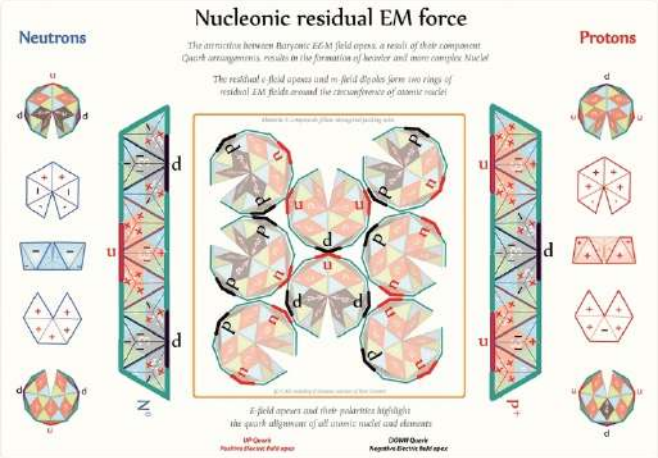
And 53.49 respectively along with the 3D CAD illustrations of the same



Should be sufficient to explain and illustrate all properties of the Zenon atom [or any other you chose] including their rest mass-Matter energies [at absolute zero], their charged Matter topology in accord with Bohr shells/orbitals and Schrodinger numbers and the kinetic mass-energies of their bound electrons.

Clarifying question 2 about Tetryonics nuclear vs. atomic size

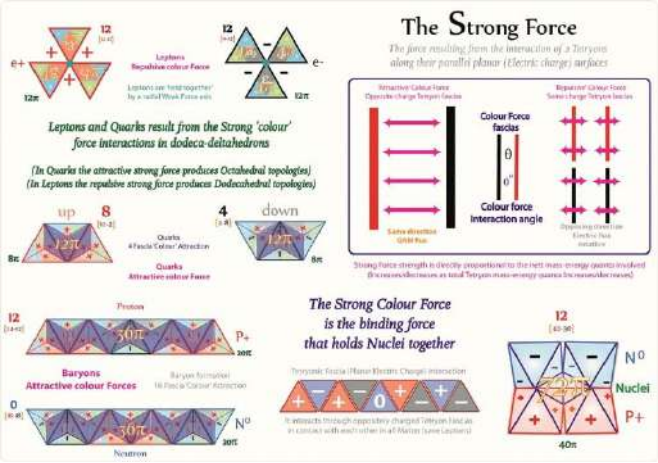
According to Tetryonics the proton and neutron in Deuterium nuclei touch one another at the point son their respective charge topologies where the e-field components of their constituent quarks are located - this is indicated on all Tetryonic element illustrations via red [for positive] focus points and black [for negative] focus points.



But since Tetryonics does not include any separate strong nuclear force but just electromagnetics, all particles of Tetryonic nucleus would fly apart in a nanosecond.

Again, this misunderstanding and erroneous statement about Tetryonic theory seems to stem from you having failed to read Tetryonics [1] – Quantum Mechanics, viewed my Tetryonics 101 instruction video or even attempted to build and understand how atomic nuclei are formed and come together to form larger elements and compounds alike prior to commenting ….

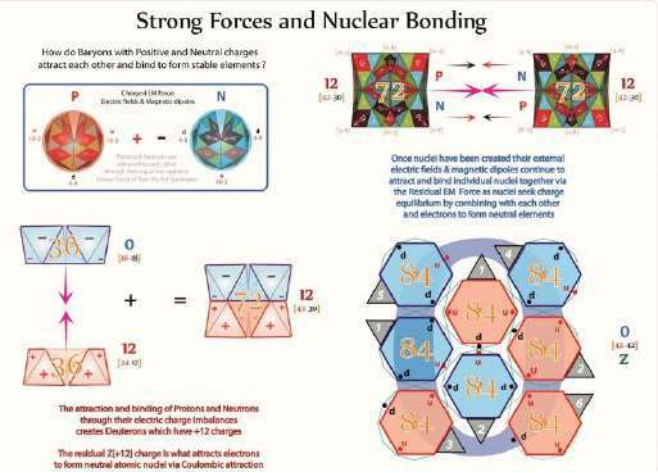
In my first eBook I have gone to great lengths to show that the STRONG force does indeed exist and in fact plays a crucial role in bringing tetryons [the tetrahedral quantum of Matter topologies themselves] together to form leptons, quarks, mesons & Baryons – it is the parallel opposite charge interaction present between the planar charge faces of each tetryon within each and every Baryon [not to be mistaken for the residual strong force]


The Strong Force
Leptons and Quarks result from the Strong 'colour' force interactions in dodeca-deltahedrons
(In Quarks the attractive strong force produces Octahedral topologies)
(In Leptons the repulsive strong force produces Dodecahedral topologies)
Colour Force fascias
Colour force interaction angle
The Strong Colour Force is the binding force that holds Nuclei together
Baryons Attractive colour Forces
Nuclei

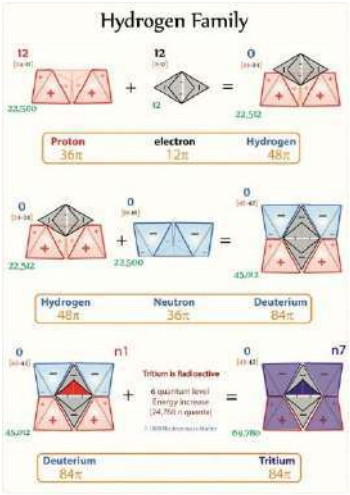
Obviously this co-planar opposite charge interaction holds all atomic nuclei together and your claim of Tetryonic particles flying away in a nanosecond just doesn't hold water…

In fact just place two sheets of glass together with a thin film of water between them and see how easy it is to pull those sheets apart by applying a force orthogonal to the co-planar sheets of glass and you'll soon understand the STRONG force much better that you do presently.

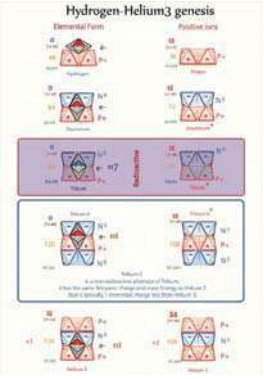
This charge interaction between the e-fields of quarks in Baryons serves to not only bring positive charge Protons together with neutral Neutrons [something modern theory cannot explain] but also serve to orientate each baryon to the other so as to facilitate electron bonding and the creation of ever larger atomic elements and compounds [the residual strong or EM force as it is often termed or the London force]


Strong Forces and Nuclear Bonding
How do Baryons with Positive and Neutral charges attract each other and bind to form stable elements ?
P
N
12
72
Once nuclei have been created their external electric fields & magnetic dipoles continue to attract and bind individual nuclei together via the Residual EM Force as nuclei seek charge equilibrium by combining with each other and electrons to form neutral elements
36
0
12
The attraction and binding of Protons and Neutrons through their electric charge imbalances creates Deuterons which have +12 charges
The residual Z[+12] charge is what attracts electrons to form neutral atomic nuclei via Coulombic attraction
84
Z

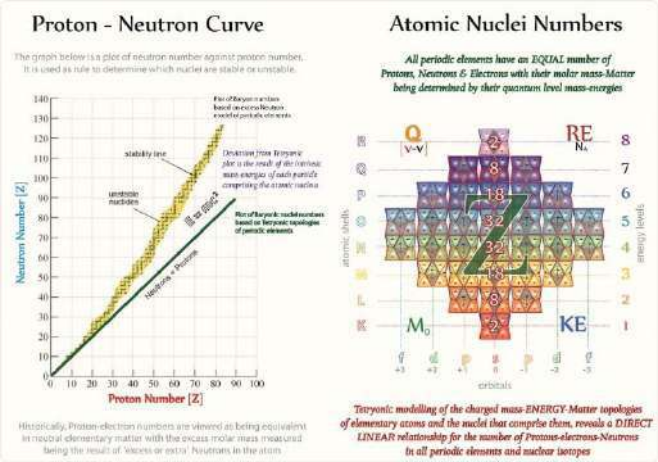
Yes I have an ‘obsession’ with all atomic nuclei have equal numbers of Protons, electron AND Neutrons in accord with their Z number, just as you have an obsession with them being Hydrogen atoms with excess Neutrons ‘bound’ to them – but for the reasons highlighted above, and many others – as for the quantum structure of Protium (regular hydrogen), Deuterium and Tritium being ‘missing’ - again my T[1] - QM eBook holds the answers



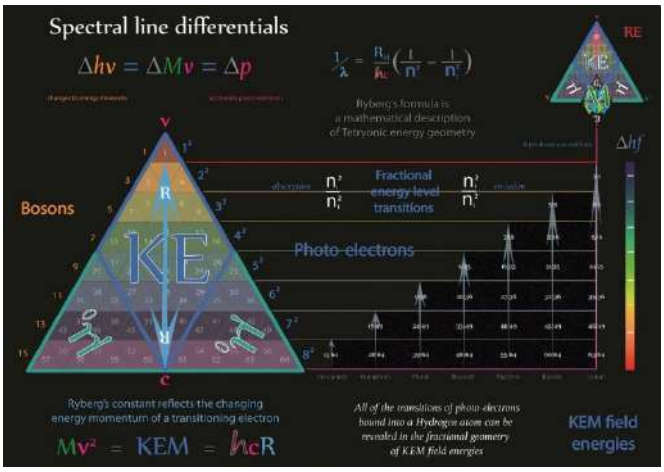
With additional space being made to highlight the Tetryonic genesis of Tritium & Helium 3



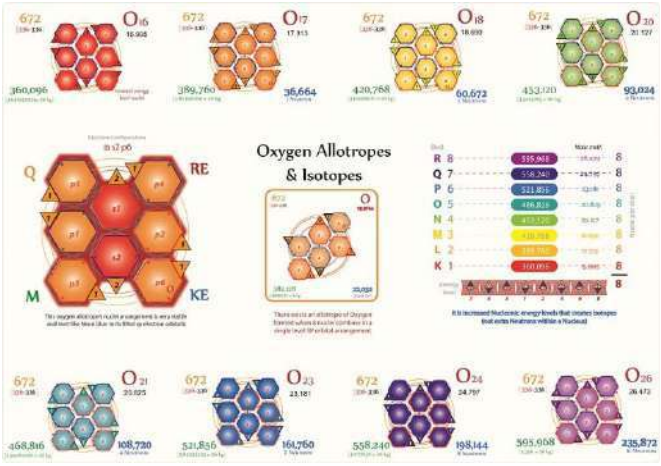
All isotopes are simply Z number nuclei with the energy levels of their Baryons raised to the next quantum energy level [n1-n8] in accord with the 3D material symmetry of the atomic nuclei themselves and the Bohr shells/Schrodinger principal quantum numbers, which can occur either through natural energy absorption or the artificial increase of their mass-energy content in the lab….


Proton - Neutron Curve
Neutron Number [Z]
Proton Number [Z]
Atomic Nuclei Numbers
All periodic elements have an EQUAL number of Protons, Neutrons & Electrons with their molar mass-Matter being determined by their quantum level mass-energies
RE
KE
Tetryonic modelling of the charged mass-ENERGY-Matter topologies of elementary atoms and the nuclei that comprise them, reveals a DIRECT LINEAR relationship for the number of Protons-electrons-Neutrons in all periodic elements and nuclear isotopes

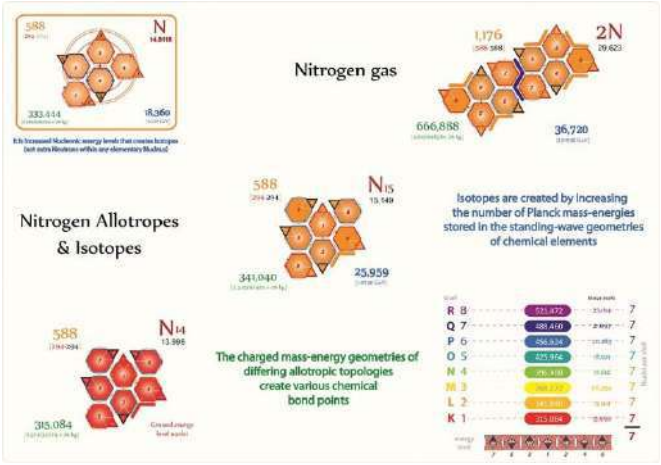
Obviously with all Deuterium nuclei being quantum synchronous convectors as the energy levels of their Baryons are increased [or decreased] the electrons bound to them respond in kind [hence synchronous] via spectral line emissions [or absorption] ….all covered in Tetryonics [2] – Quantum Electrodynamics.


Spectral line differentials
Δhν = ΔMv = Δp
Rydberg's formula is a mathematical description of Tetryonic energy geometry
Bosons
Fractional energy level transitions
Photo-electrons
KE
RE
Rydberg's constant reflects the changing energy momentum of a transitioning electron
Mv² = KEM = hcR
All of the transitions of photo-electrons bound into a Hydrogen atom can be revealed in the fractional geometry of KEM field energies
KEM field energies

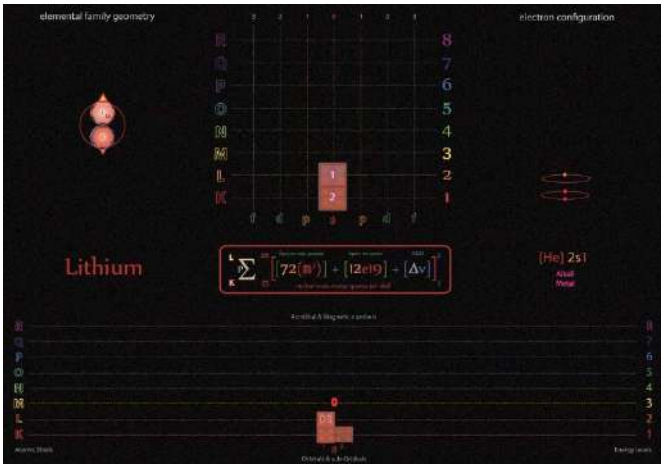
There is NO explanation in modern chemical or quantum theory that accounts for the Proton-Neutron ‘curve’ of atomic isotopes nor for the islands of stability that exist for various elements, however Tetryonic theory accounts for all of this firstly by ‘straightening’ out the curved Z line of Protons and Neutrons underpinning atomic elements [by showing that all atomic nuclei are comprised of D nuclei not H atoms with excess neutrons] and then showing that the observed isotopic masses of each are the result of increased principal energy levels of their constituent baryons with the D nuclei comprising each element…. It is no error or ‘false notion’ as you put it, rather it is the current explanation of these facts by modern theory that is in error



You have chosen Lithium to make your point I chose Carbon, Nitrogen and Oxygen to make mine, but the explanation for Lithium remains the same….. an increase in the mass-energies of the baryons making up the element concerned… btw I have done spreadsheets for each and all the elements as a matter of course during the development of my theory.


Nitrogen gas
Nitrogen Allotropes
& Isotopes
Isotopes are created by increasing the number of Planck mass-energies stored in the standing-wave geometries of chemical elements
The charged mass-energy geometries of differing allotropic topologies create various chemical bond points

Element 3 – Lithium [ground state atomic topology and electronic configuration]



Regarding your comment of “but in reality **only electrons are on these shells** and the structure of the nucleus is completely separate from these shells”, - that is only the current opinion/consensus explanation of quantum chemistry at this stage and is obviously at odds with Tetryonic theory *built from the ground up from equilateral Planck energies not the top-down through supposition*….. I am confident that over time this consensus will change.

1. Explaining the extra (neutron) weight as higher energy-levels of the Deuterium nuclei seems *ad hoc* explanation with no supporting evidence – *simply nonsense*…..
2. No calculation is presented to *derive a prediction* for the excess mass (or energy) from the Tetryonics model – *have you even read my work in detail – calculations and mass-energies are provided everywhere throughout it*.
3. The excess mass of, say, Lithium 7 (one excess neutron compared to 3x deuterium) *– again a number based on your erroneous viewpoint – not y given explanation and illustrations of the same.*
4. This is inconsistent with the fact that there are **multiple** isotopes of each element.- *how so?*

   The energy level of Baryons of each and every illustrated element in Tetryonic can be increased resulting in isotopes of that element – with NO extra Neutrons present, again you seem to have failed to read and/or comprehend what was presented before you in the Tetryonics chemistry eBook.

5. See above for Hydrogen family [please]

All the ‘observed’ masses you have provided in that table are firstly just that, weighted [averaged] measurements of particles with kinetic energies [heat, spectral, motion etc.] not the absolute rest masses I have provided and clearly stated as such…… you must account for observational and inherent kinetic energies for your stated values to even begin reflecting the quantum values of particles at absolute zero.

Again, ‘isotopes’ is NOT what you think and proclaim – there are no extra Neutrons in the nuclei – only Baryonic energy above that of the res/ground state of such an element at absolute zero – unless you can account for those KEM field energies [as should be done]

Tetryonic Problem: Helium as Alkaline Earth metal

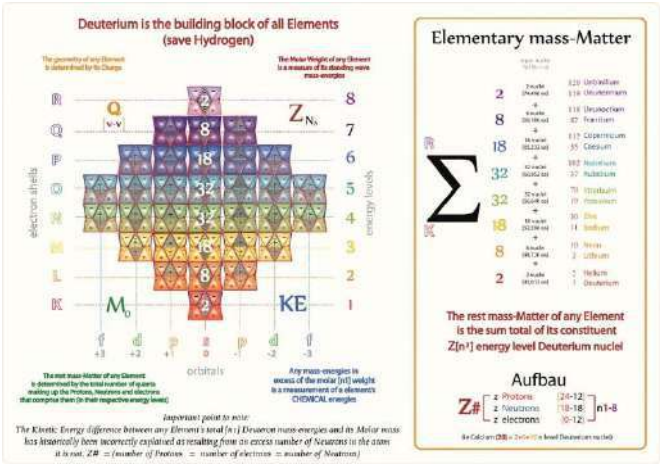
- And Hydrogen is element 1 which no-one can agree on which position it truly belongs in on the current periodic table.

Tetryonics problem: 120 possible maximum elements

- That is what is dictated by the charge topology of particles and elements themselves, perhaps you'd care to share what your spherical [or other] model for element 93 is, and how all the 'extra' Neutrons bind to each other to create that particular model?

Tetryonics shows quite clearly the reasons for there being only 120 possible periodic elements and it agrees with the math and equations of both Bohr and Schrodinger's models despite the differing quantum topologies.

Perhaps, you can produce element 121 and prove me wrong on this.

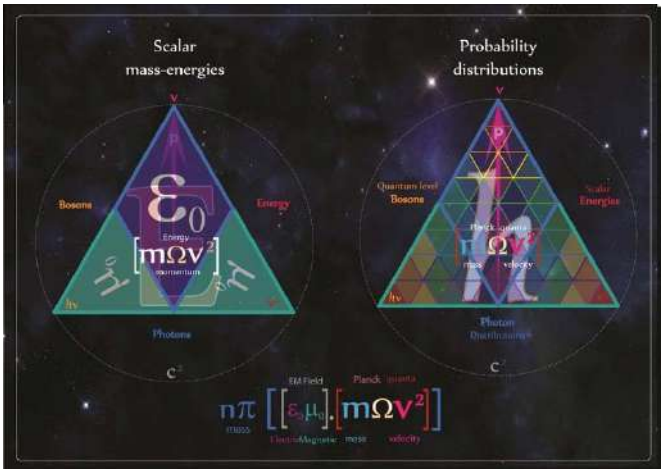


Additional random quotes - the uncertainty principle erroneously dictates that position and momentum cannot be simultaneously determined

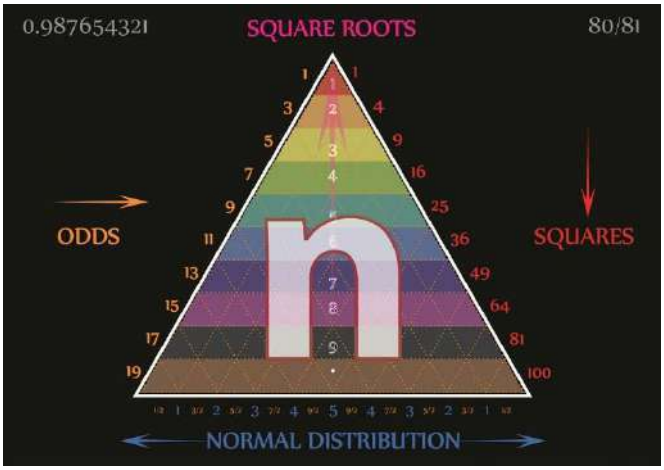
- There's nothing random about this comment/quote - Tetryonic theory is founded on the SINGLE postulate that Planck mass-energy momenta has an quantum equilateral geometry [ie quantised angular momenta (m^2/s] is equilateral/triangular not circular as it is the macro sense of angular momentum] - from that flows the fact that the probabilistic nature of quantum theory and the maths used to describe it are in fact not 'fuzzy' or indeterminate as supposed presently but in fact an emergent property of the tessellation of mass-energy momenta at the quantum level.

The inherent indeterminacy of quantum theory is a crutch used my mathematicians and scientists alike to explain many of the puzzling aspects of quantum theory like the inherent statically probabilities of quantum fields themselves or the wave-particle duality of photons or particles in motion….. Again it is them and modern theory that have simply failed to grasp the geometric reality of energy momenta that underpins these phenomena and how they build to form the familiar laws of Nature at our scale of observation.

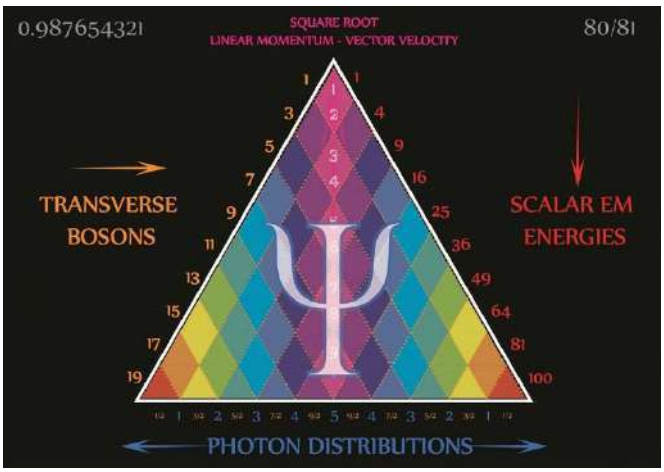
Tetryonic theory is all about correcting these erroneous assumptions and established viewpoints – but any change of perspective is not without birth pangs of angst and misunderstanding from those who first encounter it [like Newton, Planck and Einstein with their theories of Gravity, Quantum mechanics & Relativity theories before it]



That it is the transverse bosons Max Planck described using E=n.hv when resolving the ultraviolet catastrophe and spectral line emissions



And which subsequent theorists incorrectly applied directly to Einstein's formulation of E= hf to describe neutral PHOTONS of energy momenta [dual charge bosons – quantum transformers]

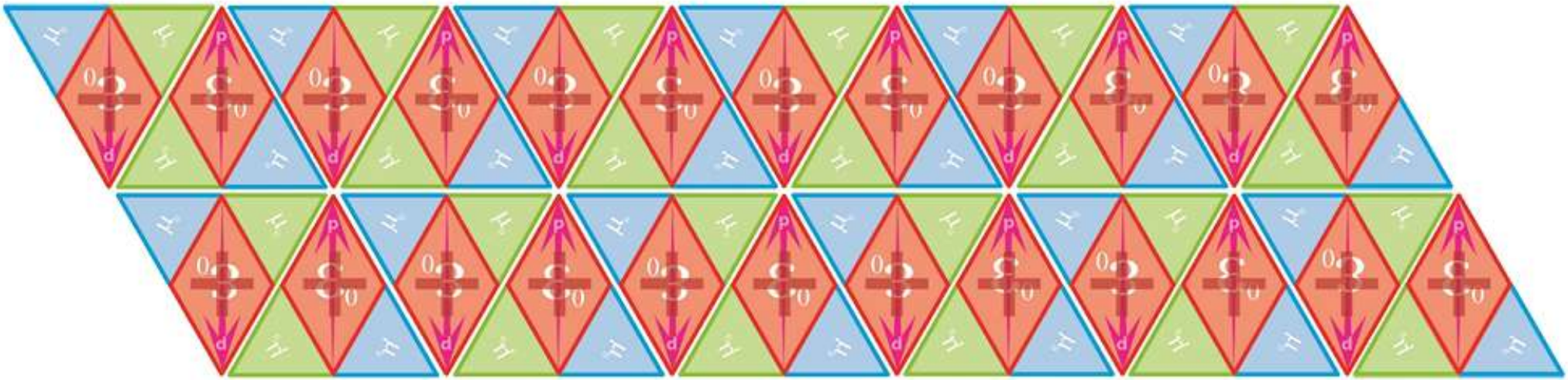


And then erroneously attributed to an inherent uncertainly in quantum field dynamics etc. that does NOT and never existed in Nature itself or in Tetryonics….

I do look forward to further elaborating Tetryonic theory in detail with you – but also strongly suggest that you become more familiar with my Tetryonics [1] – Quantum Mechanics and & Tetryonics [2] - Quantum Electrodynamics eBooks beforehand as a lot of your suspicions of, and reaction to Tetryonic theory seem to stem from a lack of understanding of the basics of the theory….

And as I mentioned in previous communications, I remain open to an online discussion so we may discuss these points in far more detail than possible herein.

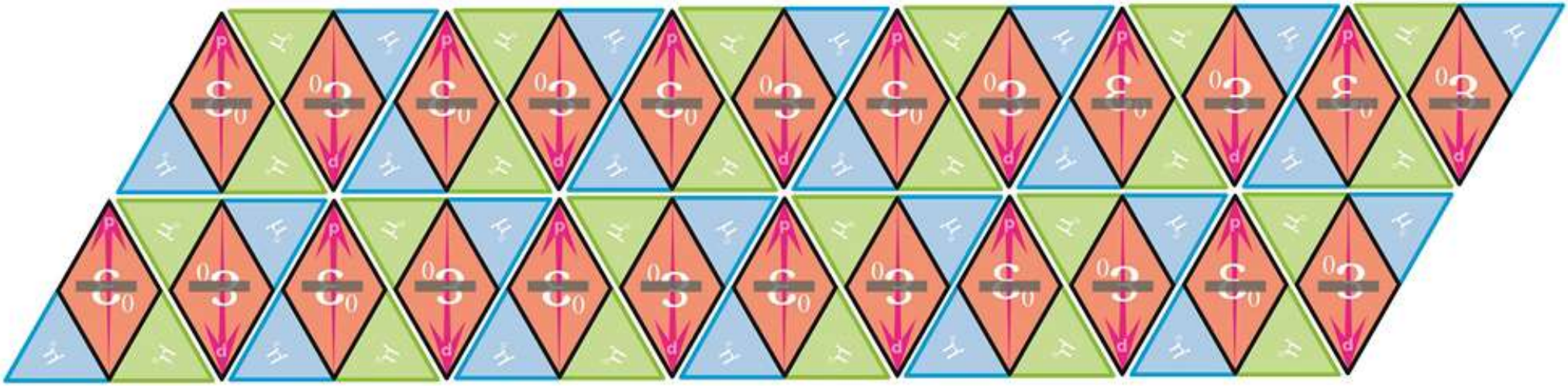
There is also lots more additional information and explanation of Tetryonic theory to be found on YouTube and Otto's Science of Life web- blog & the detailed 3D CAD models developed by Rene Cormier in the Google sketchup warehouse.

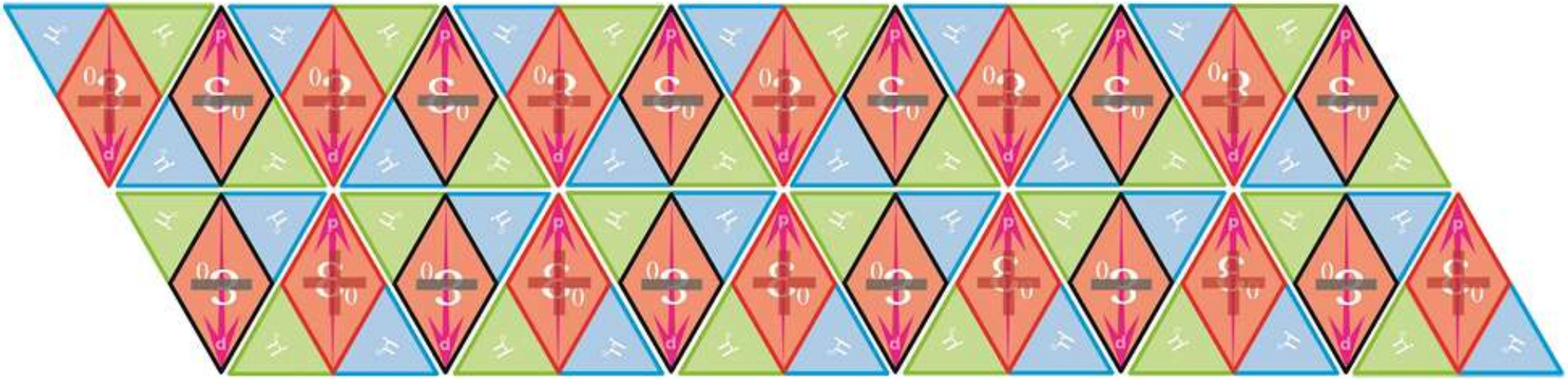


2D radiant EM mass-Energies

n1 - Charged Tetryon Templates

3D standing-wave Matter

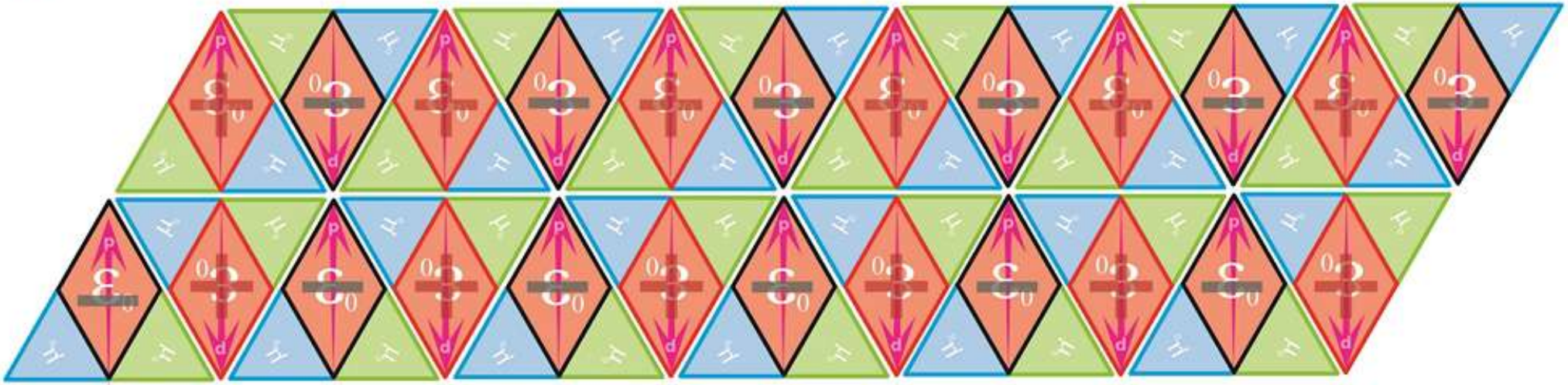


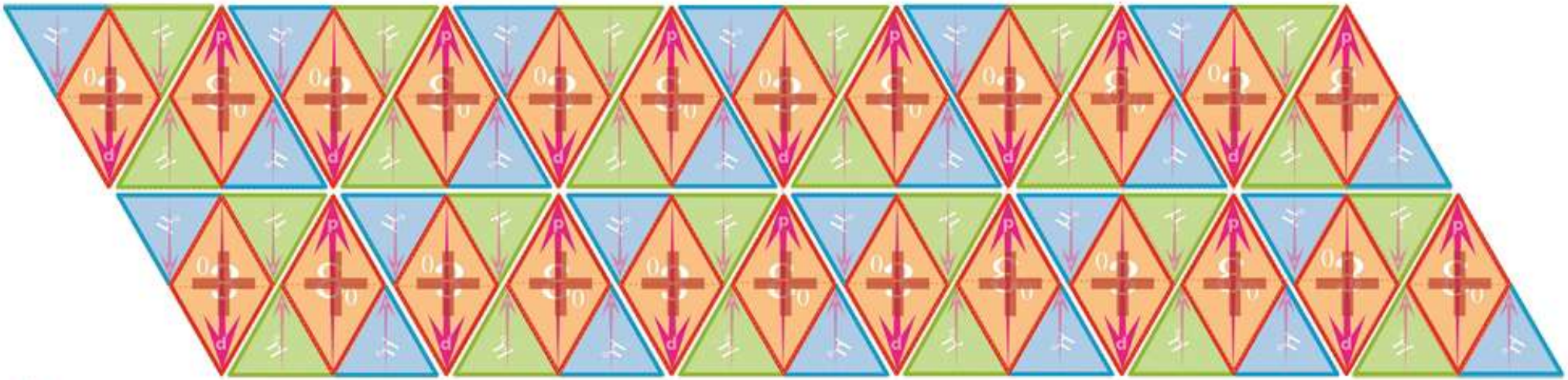


2D radiant EM mass-Energies

n1 - Neutral Tetryon Templates

3D standing-wave Matter

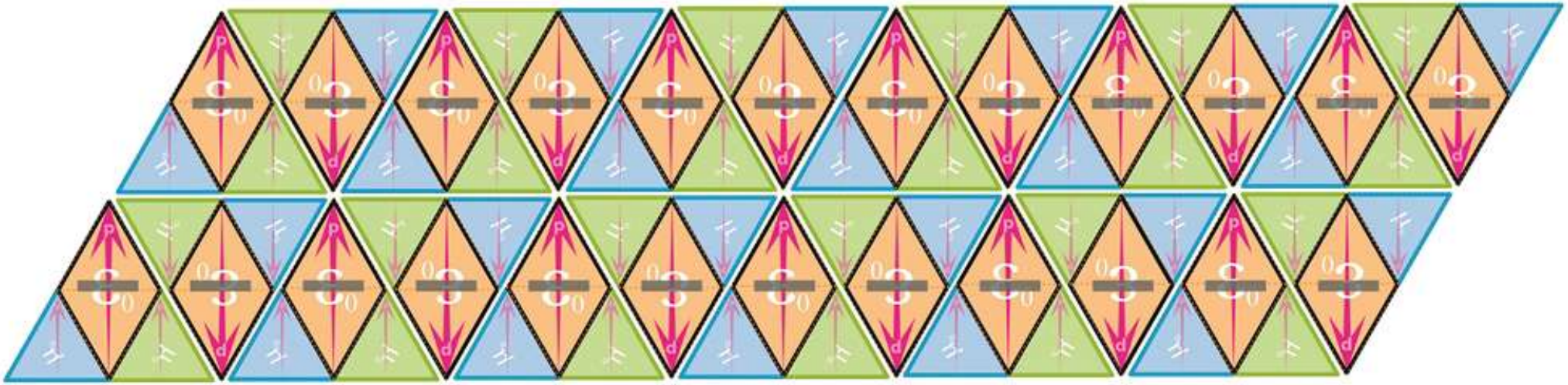


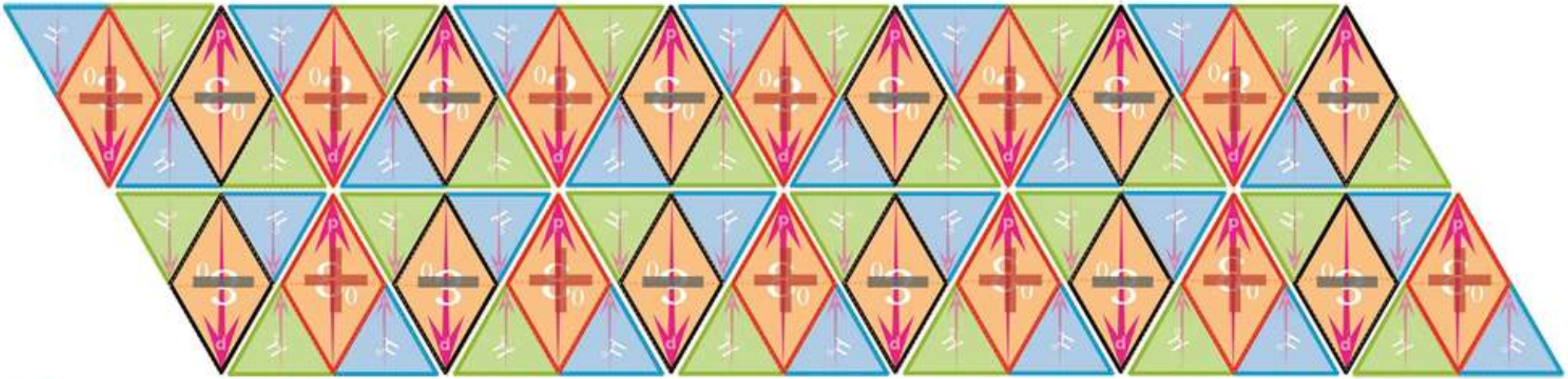


2D radiant EM mass-Energies

n2 - Charged Tetryon Templates

3D standing-wave Matter

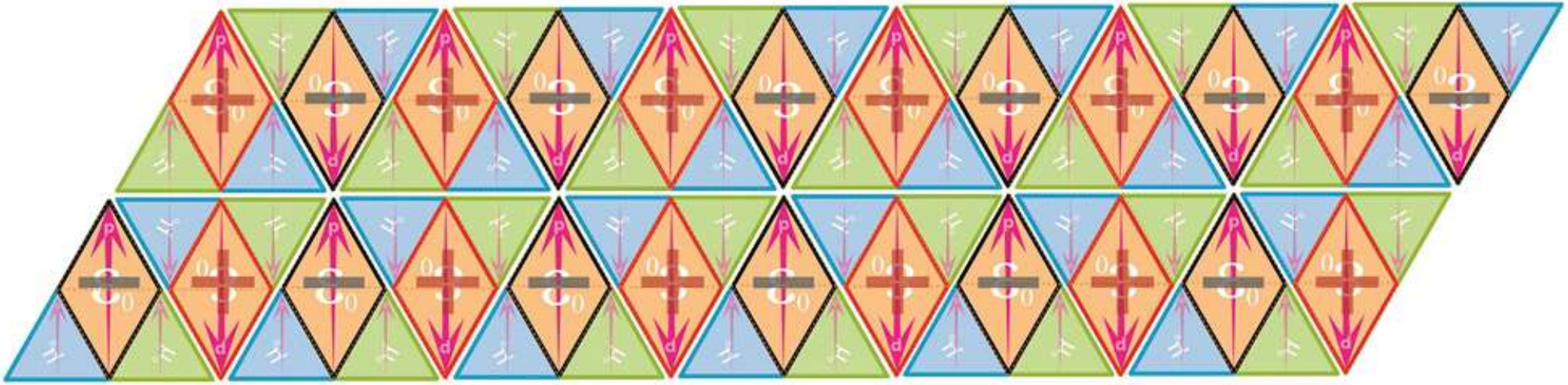


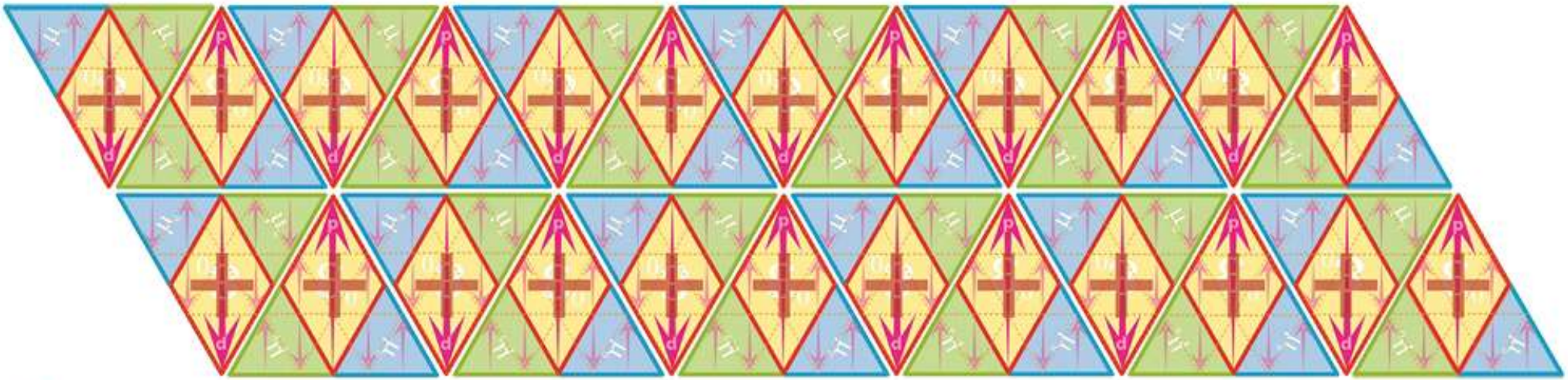


2D radiant EM mass-Energies

n2 - Neutral Tetryon Templates

3D standing-wave Matter

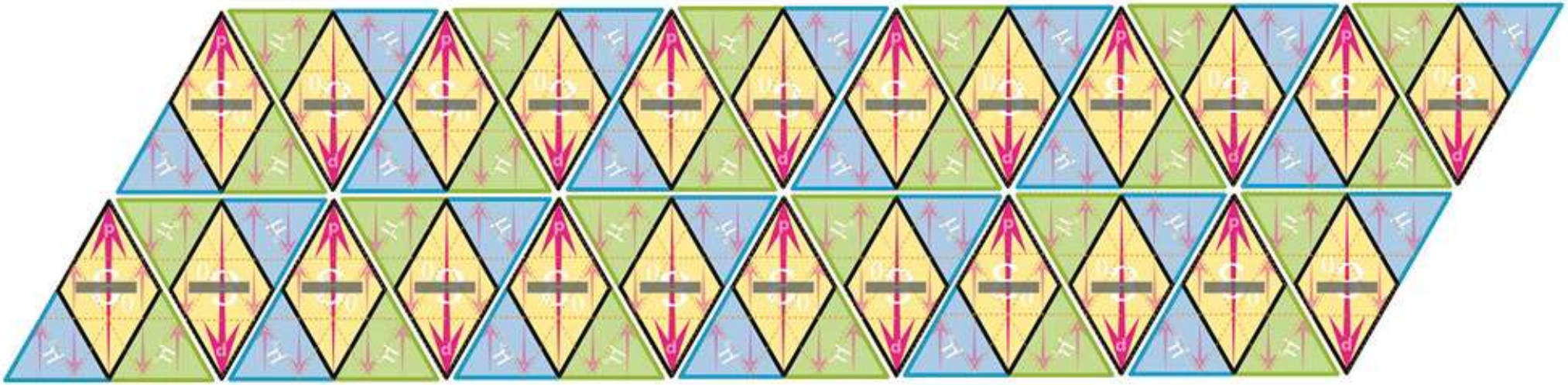


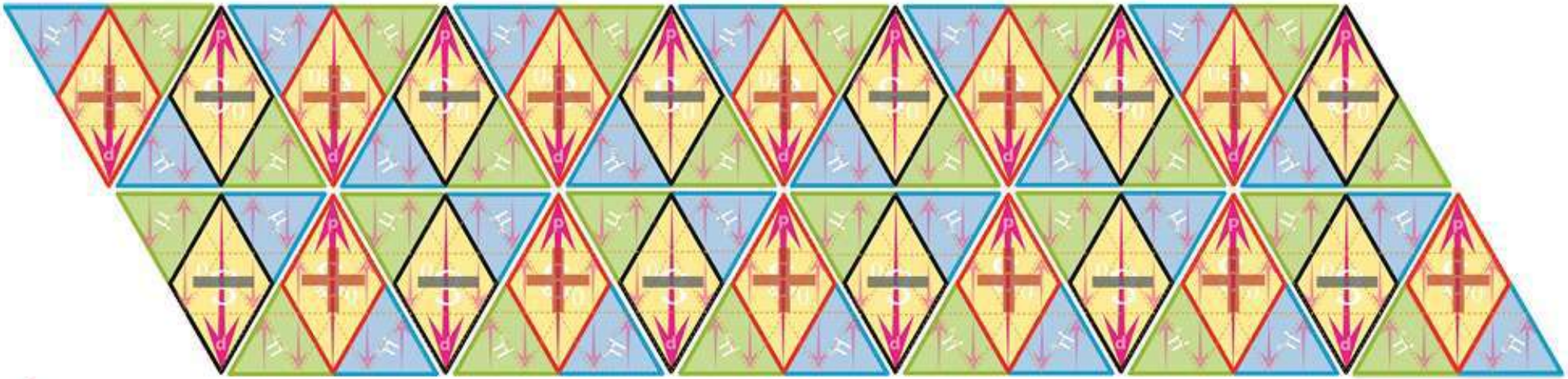


2D radiant EM mass-Energies

n3 - Charged Tetryon Templates

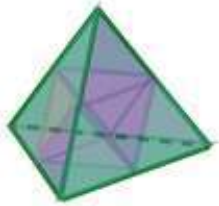
3D standing-wave Matter



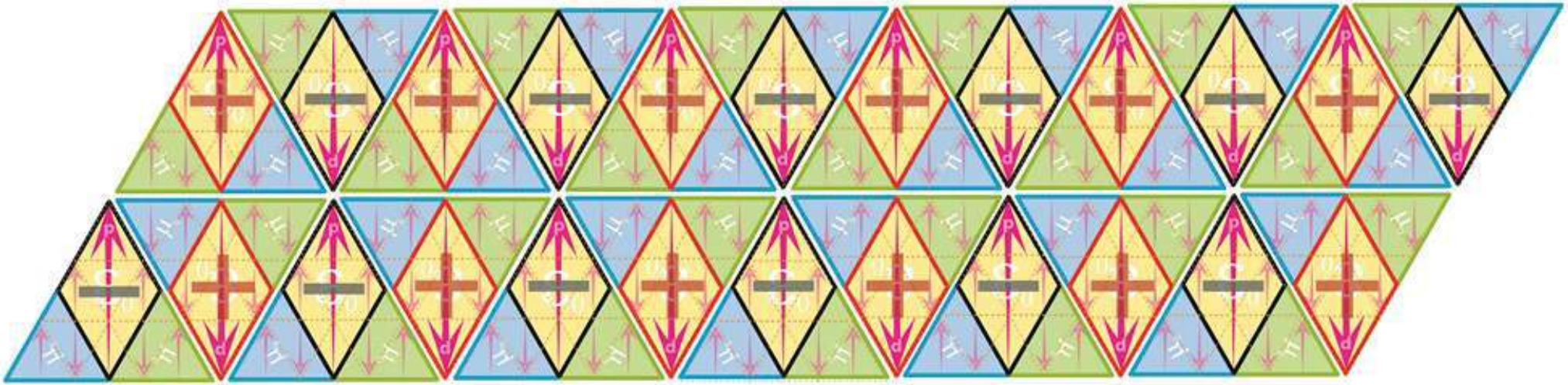


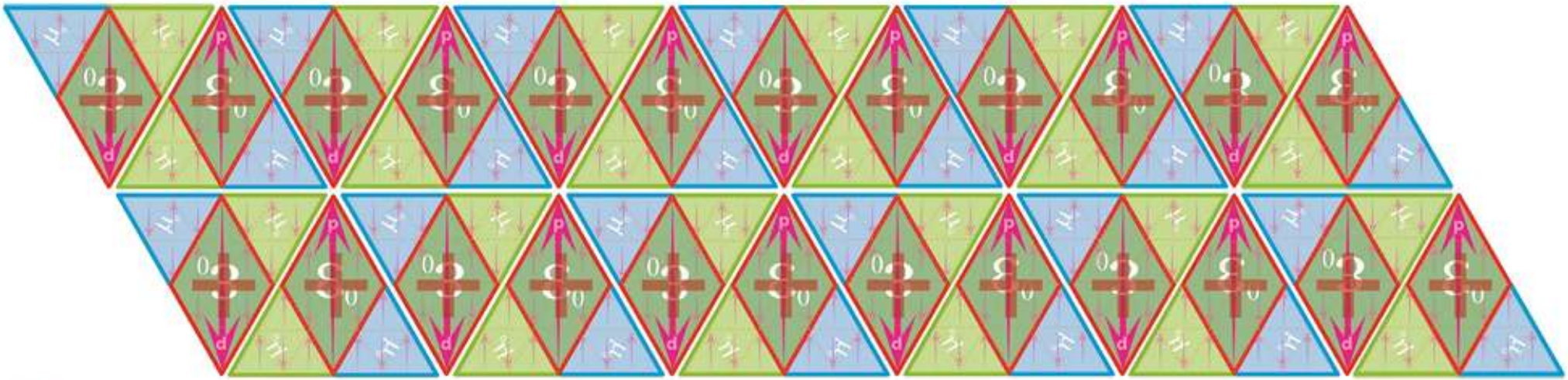
2D radiant EM mass-Energies

n3 - Neutral Tetryon Templates



3D standing-wave Matter

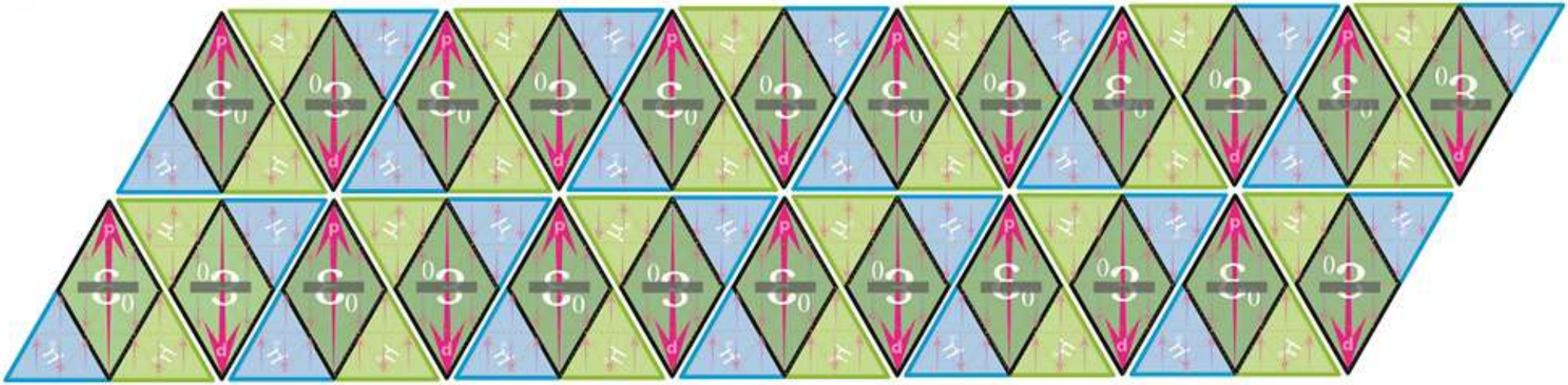


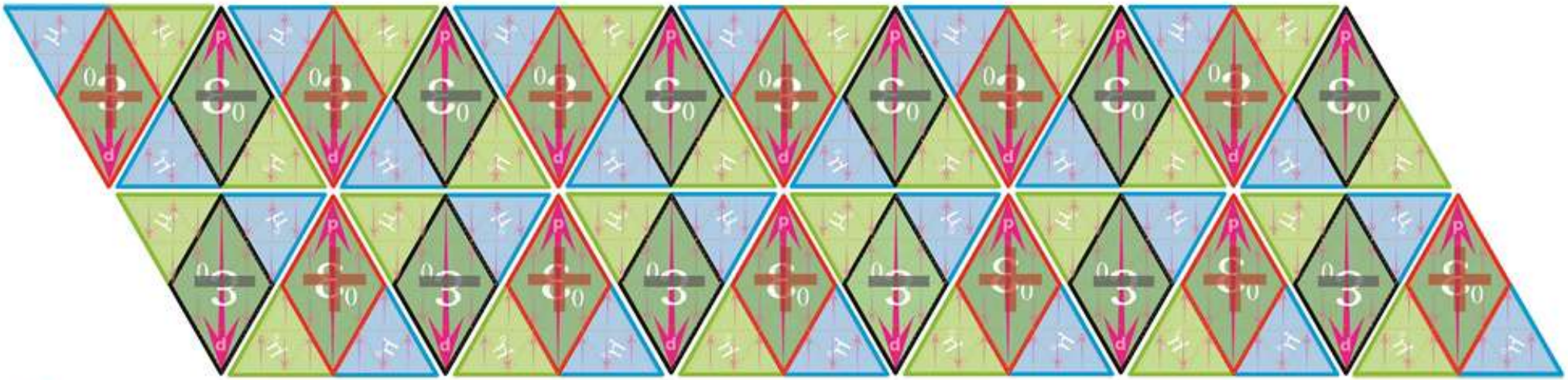


2D radiant EM mass-Energies

n4 - Charged Tetryon Templates

3D standing-wave Matter

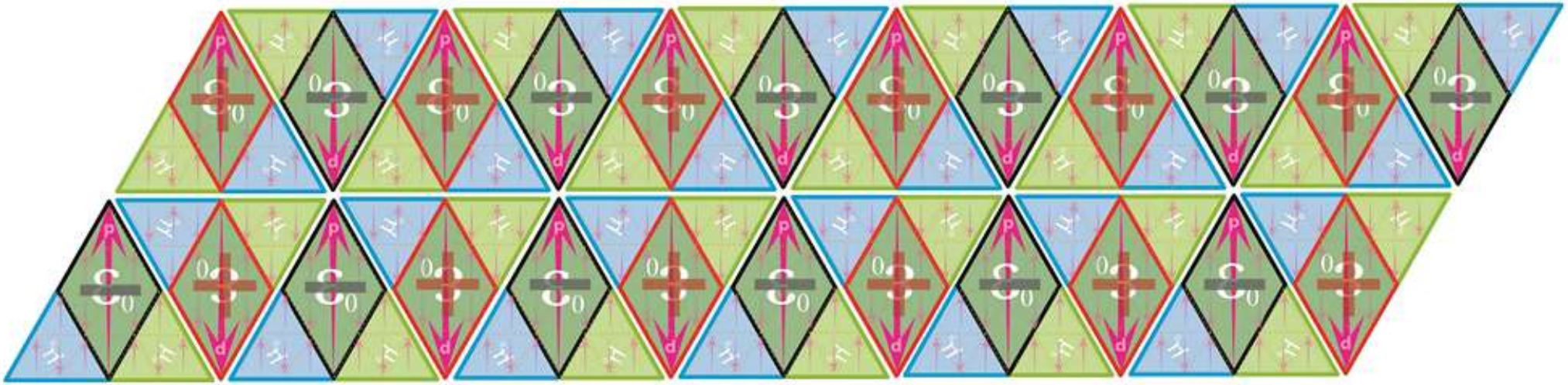


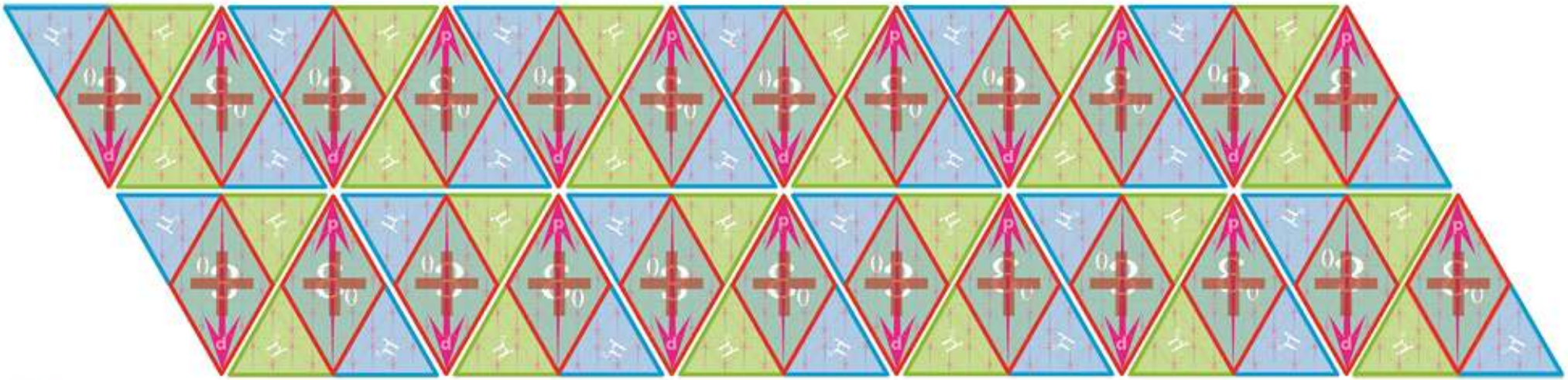


2D radiant EM mass-Energies

n4 - Neutral Tetryon Templates

3D standing-wave Matter

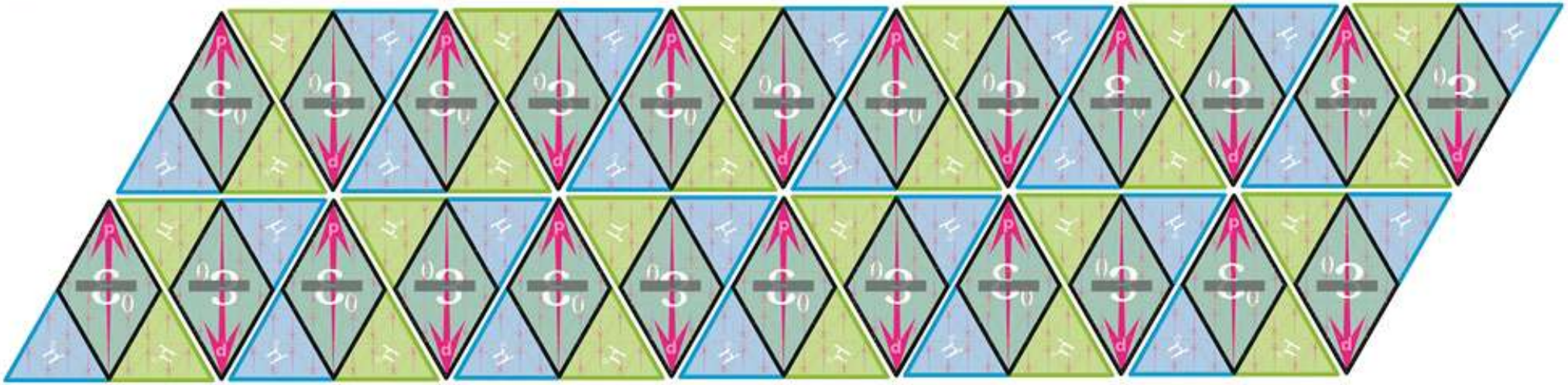


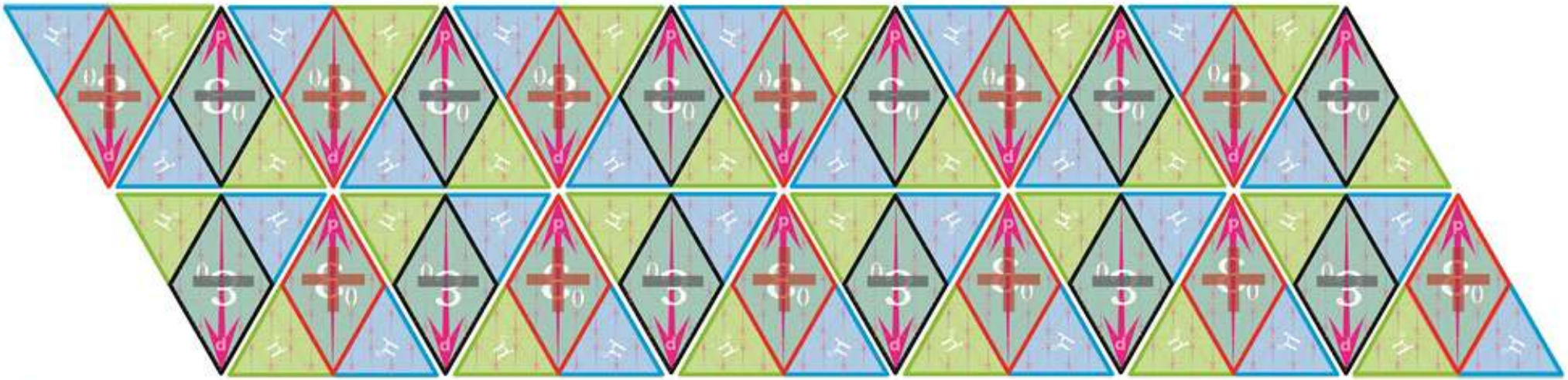


2D radiant EM mass-Energies

n5 - Charged Tetryon Templates

3D standing-wave Matter

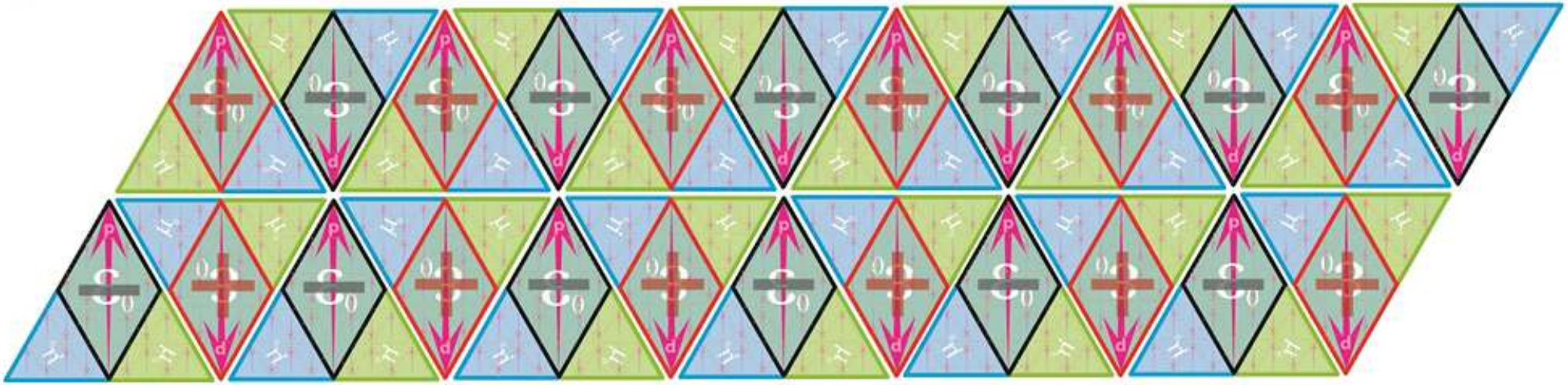


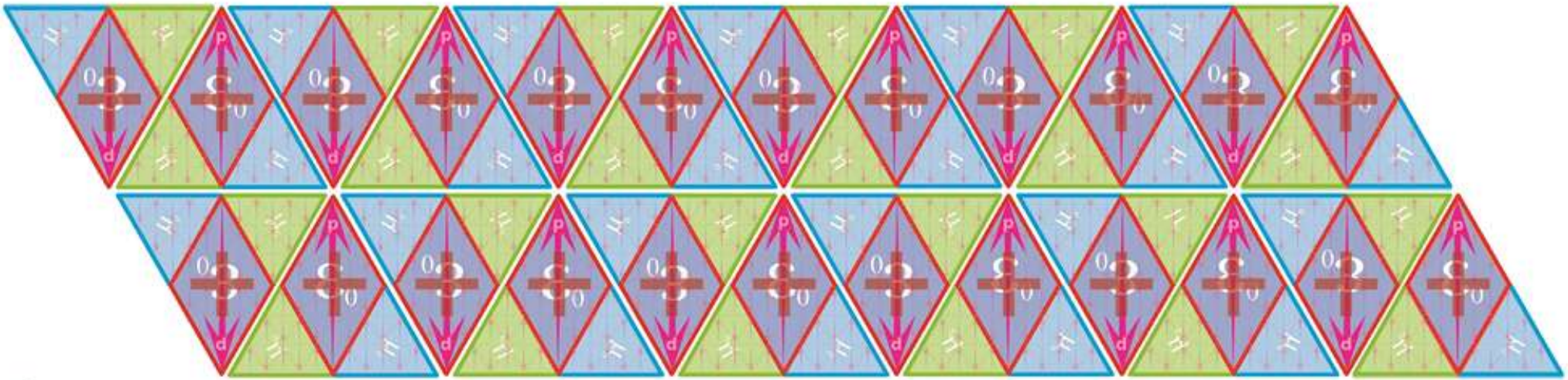


2D radiant EM mass-Energies

n5 - Neutral Tetryon Templates

3D standing-wave Matter

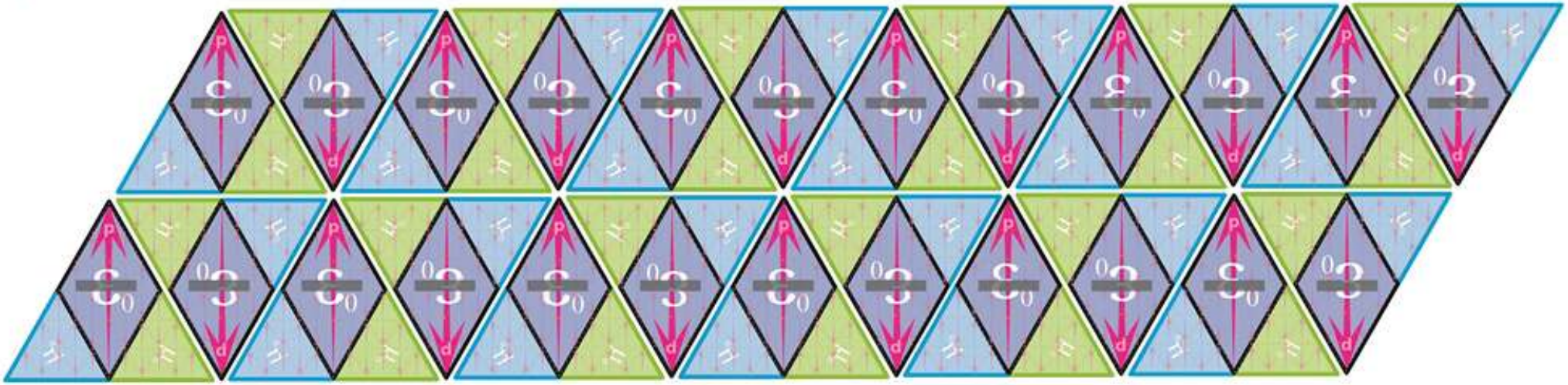


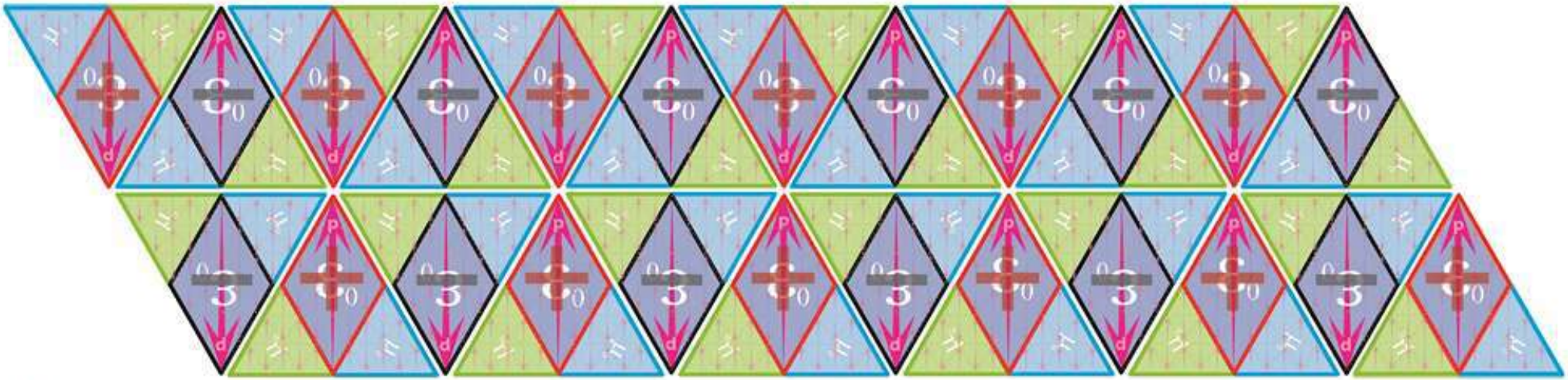


2D radiant EM mass-Energies

n6 - Charged Tetryon Templates

3D standing-wave Matter

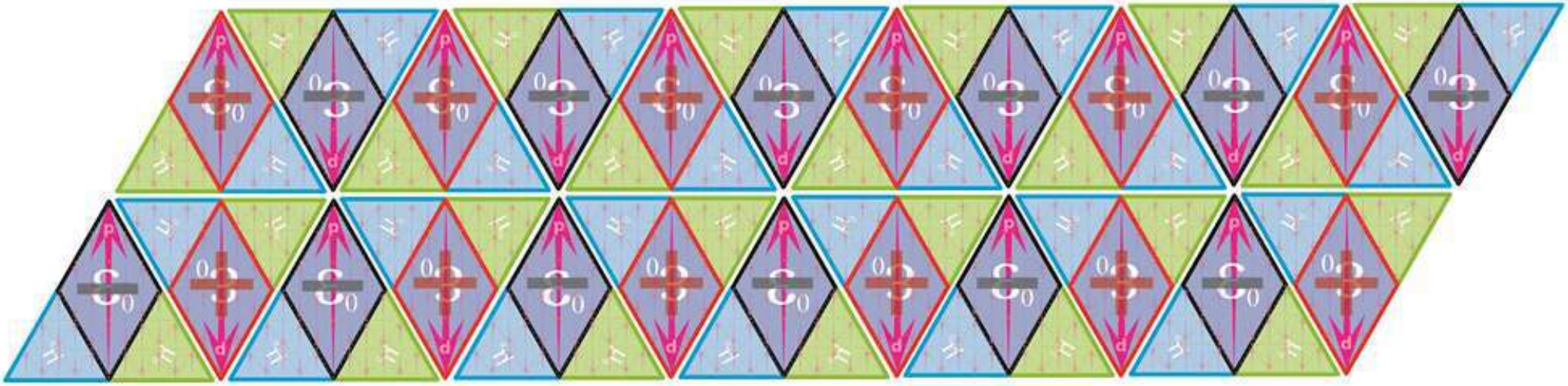


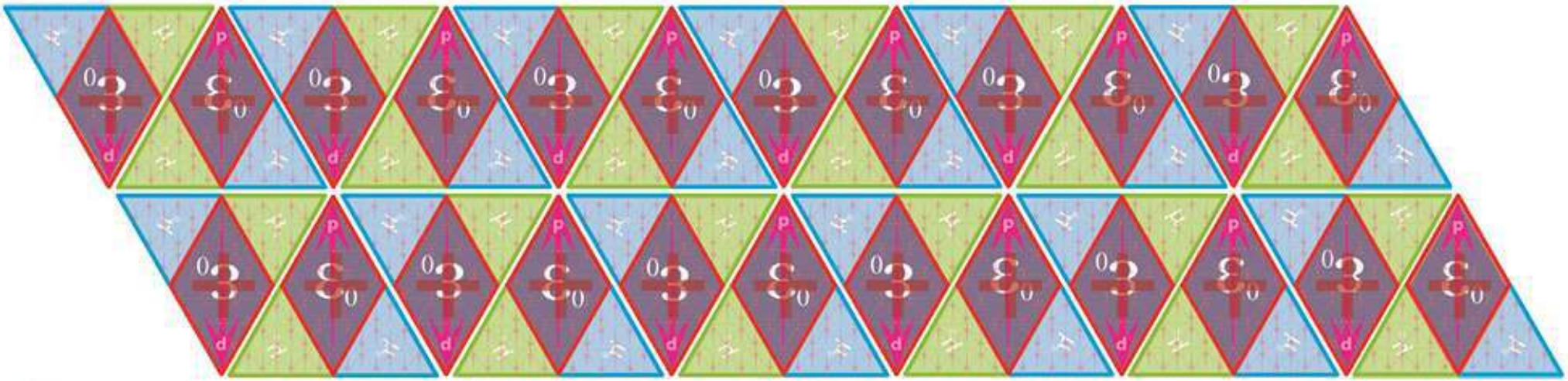


2D radiant EM mass-Energies

n6 - Neutral Tetryon Templates

3D standing-wave Matter

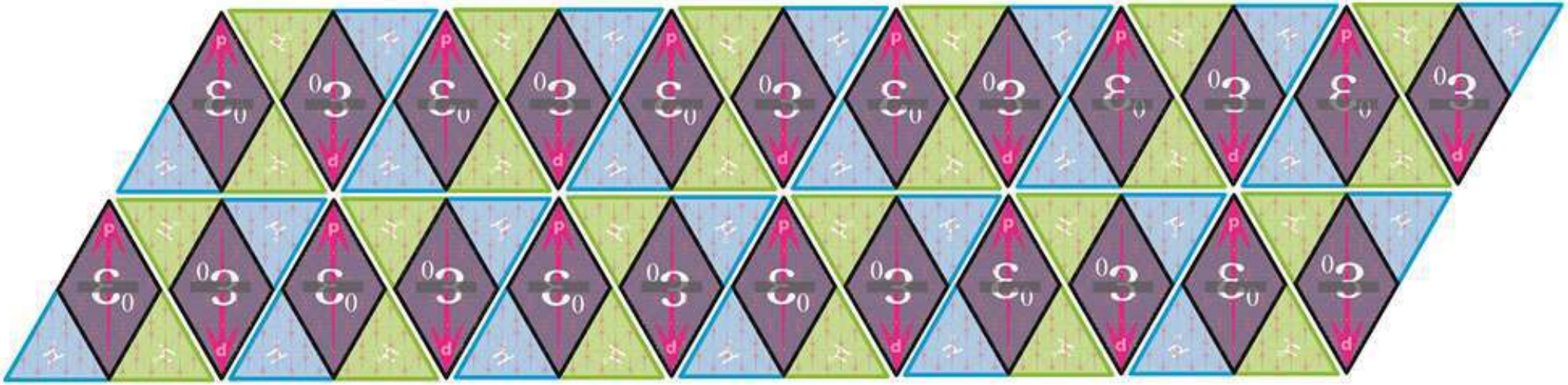


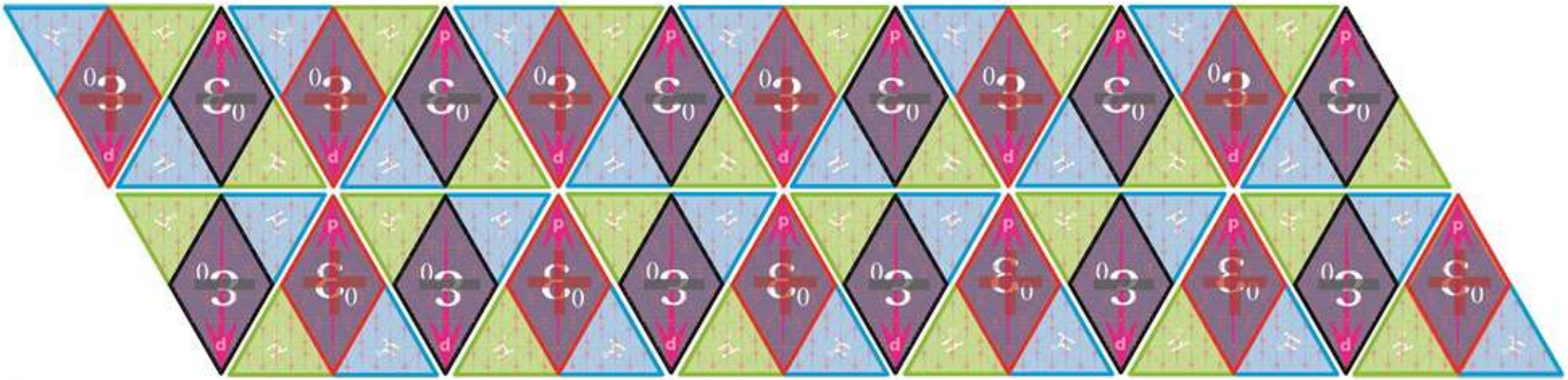


2D radiant EM mass-Energies

n7 - Charged Tetryon Templates

3D standing-wave Matter

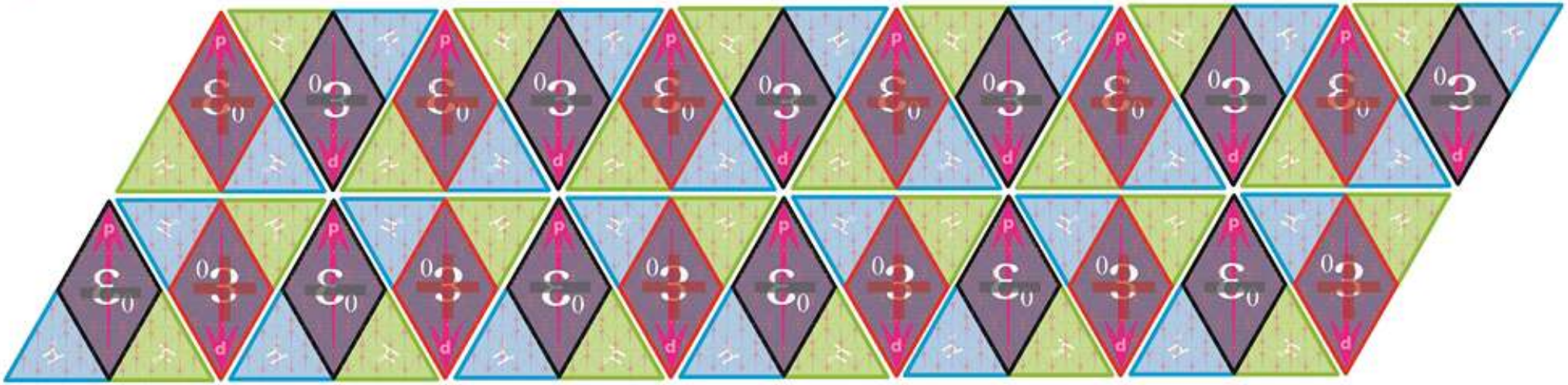


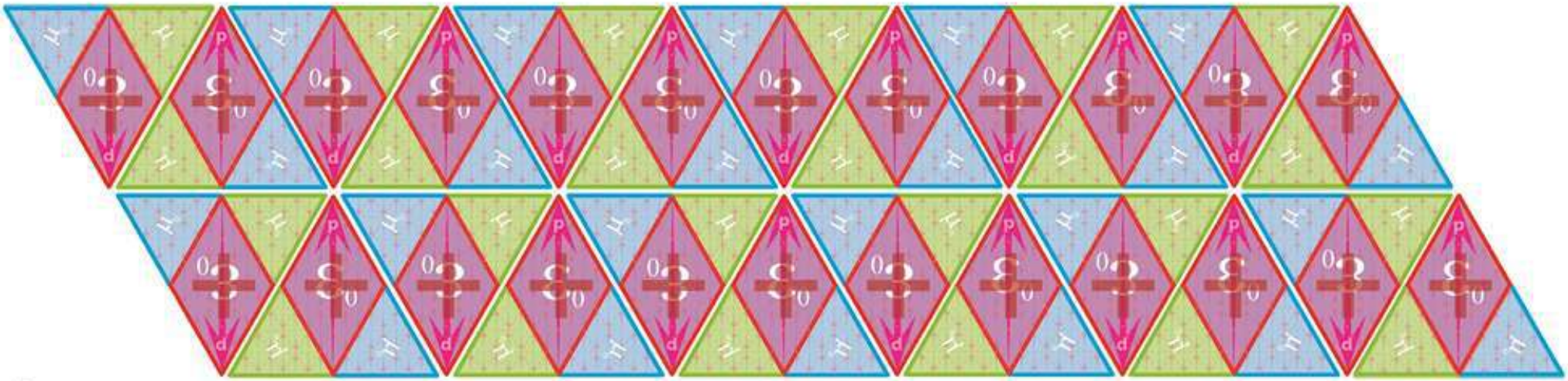


2D radiant EM mass-Energies

n7 - Neutral Tetryon Templates

3D standing-wave Matter

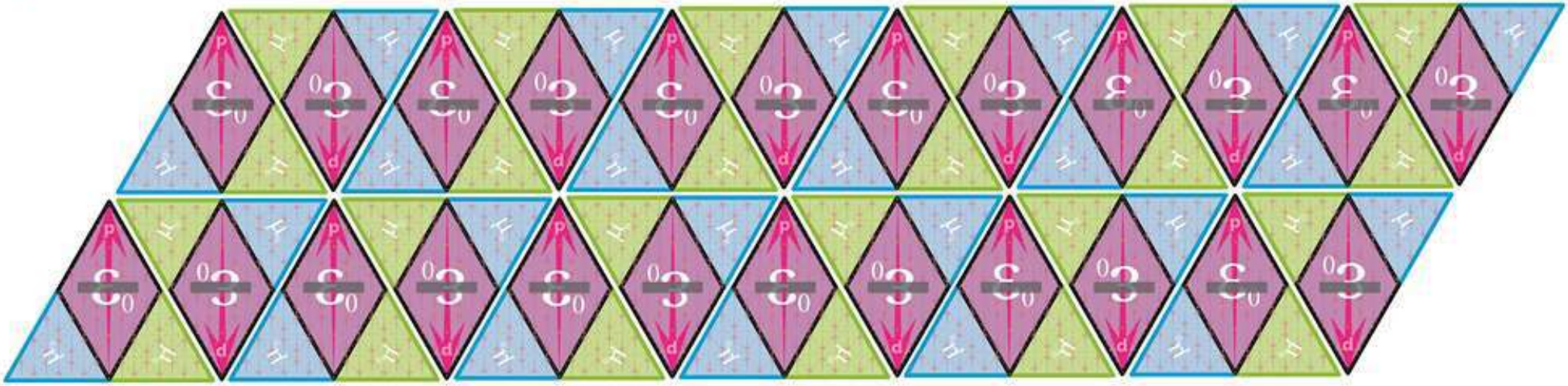


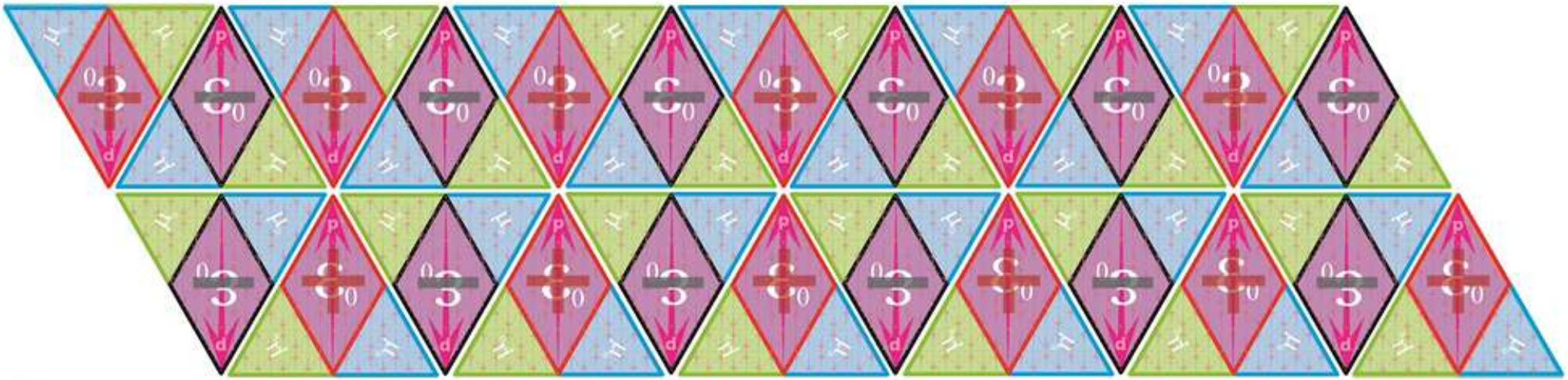


2D radiant EM mass-Energies

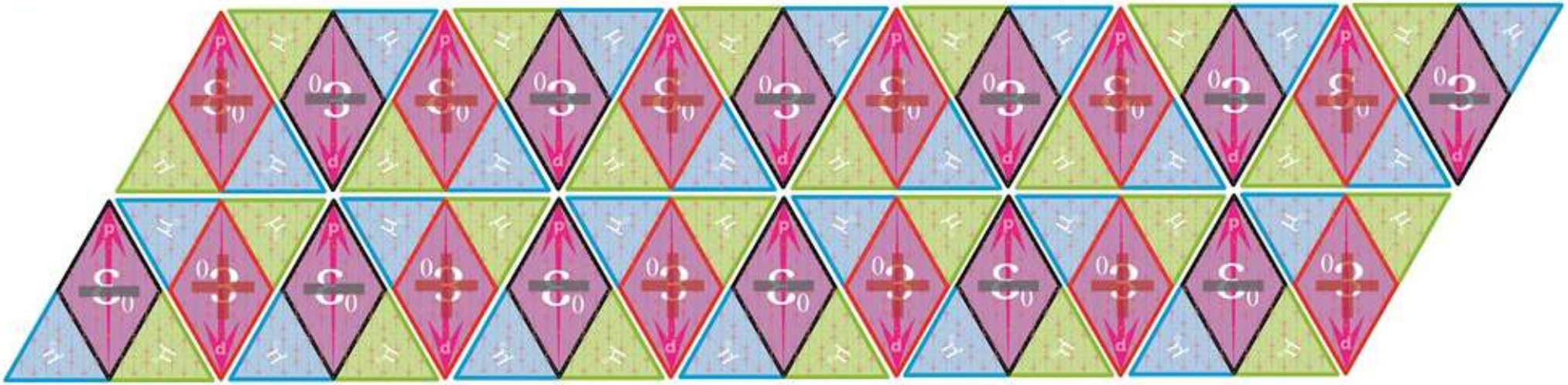
n8 - Charged Tetryon Templates

3D standing-wave Matter





2D radiant EM mass-Energies

n8 - Neutral Tetryon Templates

3D standing-wave Matter